

*IJPPAZ 57 (5) (2013)*

*ISSN 0019-5499*

**Volume 57 - Number 5 - Supplement - 2013**

**Indian Journal of  
Physiology  
and  
Pharmacology**

**The official Journal of the Association of Physiologists and Pharmacologists of India**





## Preface

It is our immense pleasure to invite you to National Institute of Mental Health and Neuro Sciences (NIMHANS), Bengaluru for the 59<sup>th</sup> Annual Conference of Association of Physiologists and Pharmacologists of India (APPI). During the conference, we aim to discuss the scientific advances achieved in Physiology and Pharmacology across the globe. The theme of the conference is ***Decades of Research in Physiology and Pharmacology: Reminders to remember and focus.***

Scientific program including plenary lectures and symposia is being planned to provide an opportunity for the delegates to keep themselves abreast with the rapid progress being made in the exciting fields of physiology and pharmacology. In this regard, it is heartening that several leading scientists have consented to participate in these academic exercises. In addition to the usual CME program, three pre-conference workshops are being planned to provide a more interactive and hands on training opportunity.

Bengaluru is an enchanting city in which the old world charm of its cultural heritage blends with the excitement of technological boom. The city is considered to be the National center of scientific information – technological, industrial and educational activities. We welcome you to experience the science city of Bengaluru.

Wishing you all a pleasant stay at Bengaluru



**Dr. T.N. Sathyaprabha**  
Organizing Secretary  
APPICON 2013



**Dr. T.R. Raju**  
Patron  
APPICON-2013

## Acknowledgements

1. We gratefully acknowledge the financial support received from the DEPARTMENT OF BIOTECHNOLOGY (DBT), Government of India; INDIAN COUNCIL FOR MEDICAL RESEARCH (ICMR), New Delhi; Directorate of Extramural Research and Intellectual Property Rights (ER & IPR), New Delhi for enabling us to bring out the abstract book of APPICON 2013.
2. We would like to thank RAJIV GANDHI UNIVERSITY OF HEALTH SCIENCES, KARNATAKA for providing the financial support for conducting symposium on “Neurophysiologic aspects of vestibular apparatus in aviation and space induced challenges” and Physiological mechanisms underlying Yoga based rehabilitation program” in APPICON 2013.

November 2013

Organizing Committee  
APPICON 2013

## Contents

Scientific Programme .....	vii
APPI Awardees .....	xxviii
Plenary Lectures.....	xxxix
Symposia.....	1
R. Srinivasan Prize Presentation .....	35
Harish Gupta Prize Presentation.....	41
Oral Presentation – Session 1 .....	46
Oral Presentation – Session 2 .....	61
Poster Presentation – Session 1 .....	77
Poster Presentation – Session 2 .....	182



# Scientific Programme





# *59th Annual Conference of Association of Physiologists and Pharmacologists of India (APPI)*

## *Decades of Research in Physiology and Pharmacology: Reminders to remember and focus*

**November 28-30, 2013**

**Venue: NIMHANS Convention Center,**

Bengaluru - 560 029

### **Program at a Glance**

<b>Day 1</b>	<b>Wednesday, 27, November 2013</b>		
4.00PM – 6.00PM	Executive Committee Meeting		
7.30PM – 9.30PM	Dinner		
<b>Day 2</b>	<b>Thursday, 28, November 2013</b>		
08.00AM – 5.30PM	Registration		
09.00AM – 10.00AM	Key Note address		Hall A
	Prof. B.M. Hegde, Padma Bhushan Awardee Former Vice Chancellor, Manipal University		
10.00AM – 10.30AM	Plenary Lecture - 1		Hall A
	Dr. A.N. Balamurugan, University of Minnesota, Minneapolis		
10.30AM – 11.00AM	Tea Break		
11.00AM – 1.00PM	Symposium 1	Symposium 2	Harish Gupta Prize
	Hall A	Hall B	Hall C
	Neural Plasticity and Brain Repair	Reproductive Physiology: Newer opportunities for advanced research	
1.00PM – 2.00PM	Lunch		
2.00PM – 3.00PM	Poster Presentation - I (P1-P190)		
3.00PM – 3.15PM	Tea Break		
3.15PM – 5.15PM	Symposium 3	Symposium 4	Oral Paper Presentation-I (O1-O29)
	Hall A	Hall B	Hall C

	Ageing in Health and Disease	Physiological mechanisms underlying Yoga based rehabilitation programs	
6.00PM – 7.30PM	Inauguration		Hall A
7.30PM – 8.30PM	Cultural Programme		Hall A
8.30PM – 10.30PM	Dinner		
<b>Day 3</b>	<b>Friday, 29, November 2013</b>		
8.00AM – 9.00AM	Registration		
9.00AM – 9.45AM	Plenary Lecture – 2 Prof. Todd C Sacktor, Albert Einstein College of Medicine, Brooklyn, New York		Hall A
9.45AM – 10.15AM	Plenary Lecture – 3 Prof. Nihar R. Biswas, AIIMS, New Delhi		Hall A
10.15AM – 10.30AM	Presentation by Elsevier Health Sciences		Hall A
10.30AM – 11.00AM	Tea Break		
11.00AM – 1.00PM	Symposium 5 Hall A	Symposium 6 Hall B	Symposium 7 Hall C
	Neurobiology and Pharmacotherapy in Addictive Behavior	Gastro-Intestinal Physiology: Research Opportunities at Indian Scenario	Neurobiology of Cognition
1.00PM – 2.00PM	Lunch		
2.00PM – 3.00PM	Poster Presentation-2 (P191-P392)		
3.00PM – 3.15PM	Tea Break		
3.15PM – 5.15PM	Symposium 8 Hall A	Symposium 9 Hall B	Srinivasan Prize Hall C
	Environmental Toxicology	Cardiovascular Responses in Health and Disease	
5.30PM – 7.00PM	General Body Meeting		Hall A
7.00PM – 10.00PM	Banquet Dinner		

<b>Day 4</b>		<b>Saturday, 30, November 2013</b>		
8.30AM – 9.00AM	Registration			
9.00AM – 9.30AM	Plenary Lecture – 4 Dr. Shashi B Singh, DIPAS, Delhi			Hall A
9.30AM – 10.00AM	Maj. Gen. S.L. Bhatia Oration Award			Hall A
10.00AM–11.00 AM	Presentation by Awardees  1. M.L. Gupta Prize 2. B.K. Anand Research Prize 3. Dev Raj Bajaj Research Prize 4. Dr. Shushila Thacker Prakruti Mandir Prize 5. Prof. R.C. Shukla Oration Award 6. Life Time Achievement award			Hall A
11.00AM – 11.15AM	Tea Break			
11.15AM – 1.15PM	Symposium 10 Hall A	Symposium 11 Hall B	Symposium 12 Hall C	Oral Paper Presentation-2 (O30-O57)  1 <sup>st</sup> Floor
	Nutrition and Air Pollution: Some Questions and caveats	Research updates on Hormonal and Metabolic Diseases	Neurophy- siologic aspects of vestibular apparatus in aviation and space induced challenges	
1.15PM – 2.00PM	Lunch Break			
2.00PM – 4.00PM	Panel Discussion			Hall A
4.00PM – 5.00PM	Concluding Remarks and Award Distribution			Hall A

## *WEDNESDAY 27, November 2013*

4:00 PM to 6:00 PM  
Executive Committee Meeting

7.30 PM – 9.30 PM  
Dinner

## *THURSDAY 28, November 2013*

9.00AM – 10.00 AM

### **KEY NOTE ADDRESS**

**Chairperson**

**Dr. T.R. Raju**

Senior Professor and Head of Neurophysiology, NIMHANS, Bengaluru

**PROF. B.M. HEGDE, Manipal University**

**Title: New Science of Man**

MD, PhD, FRCP (Lond.Edin, Glasg., and Dublin),  
FACC,FAMS, Padma Bhushan Awardee

**10.00AM – 10.30AM**

**Plenary Lecture -1**

**Chairperson**

**Dr. Bindu M Kutty**

Professor, NIMHANS, Bengaluru

**Dr. A.N. BALAMURUGAN**

**Title: Recent advances in islet cell transplantation**

Director, Islet Core,  
Associate Director, Islet Transplant Program,  
Schulze Diabetes Institute [Formerly: Diabetes Institute for Immunology and Transplantation],  
Assistant Professor of Surgery,  
University of Minnesota, Minneapolis, MN 55455

**10.30 AM – 11.00 AM**

**TEA BREAK**

*28, November 2013 - 11.00AM – 1.00PM*

**Symposium 1**

**HALL A**

**Neural Plasticity and Brain Repair**

**Discussion Leaders:**

1. Dr. Narender Dhingra, Additional Professor, NBRC, Gurgaon, Delhi
2. Dr. Kiranmai S Rai, Professor of Physiology and Neuroscience, KMC International Center, Manipal University, Manipal

Sl.No.	Speaker	Affiliation	Title
1	Dr. Sajikumar Sreedharan	Assistant Professor Level 4, Neurobiology Programme Department of Physiology Centre for Life Sciences (CeLS) 28 Medical Drive National University of Singapore Singapore 117456	Metaplastic regulation of synaptic co-operation and competition and its implications in physiology and pathology of long- term memory
2	Dr. James Premdoss Clement Chelliah	Faculty Fellow Department of Neuroscience JNCASR, Jakkur, Bangalore 560 024 Karnataka India Ph: +91-080-2208-2613	Pathogenic SYNGAP1 haploinsufficiency impairs cognitive development by disrupting the maturation of dendritic spine synapses.
3	Dr. Yogendra H. Raol	Department of Pediatrics Division of Neurology School of Medicine, Translational Epilepsy Research Program, University of Colorado Anschutz Medical Campus, Aurora, CO 80045, USA	Neonatal seizures: brain injury, plasticity and a novel treatment approach
4	Dr. Suman Jain	Additional Professor, Department of Physiology, AIIMS, New Delhi	Iron oxide nanoparticles and magnetic field exposure promote functional recovery by attenuating free radical-induced damage in rats with spinal cord transection

28, November 2013 - 11.00 AM – 1.00 PM

**Symposium 2**

**HALL B**

**Reproductive Physiology: Newer opportunities for advanced research**

**Discussion Leaders:**

1. Dr. B D Banerjee, Professor and Lab in-charge, Environmental Biochemistry and Molecular Biological Laboratory, Department of Biochemistry, University of Delhi
2. Dr. Anil Kumar Pandey, Associate Professor, Department of Physiology, BPS Govt. Medical College for Women, KhanpurKalan, Sonapat, Haryana

Sl.No.	Speaker	Affiliation	Title
1	Dr. Jayshree Sengupta	Professor and Head, North Delhi Municipality Corporation Medical College and Hindu Rao Hospital, Indraprastha University, New Delhi.	Molecular basis of ovarian endometriosis
2	Dr. Debabrata Ghosh	Professor, Dept. of Physiology, AIIMS, New Delhi	Endometrial receptivity toward blastocyst implantation in the primate: A middle out view
3	Dr. Anajali Karande	Professor, Department of Biochemistry, Indian Institute of Science, Bengaluru	The Effect of Glycodelin on the Cytolytic Activity of CD8 <sup>+</sup> T Lymphocytes: Implications in Primate Pregnancy
4	Dr. Kamalesh Gulia	Sleep Research Laboratory, Comprehensive Center for Sleep Disorders Sree Chitra Tirunal Institute for Medical Sciences & Technology, Trivandrum 695012 Kerala, India	Role of Orexin A (hypocretin-1) in modulation of male sexual behaviour

**11.00 AM – 1.00 PM**

**Chairperson**

Dr. Narender Dhingra, NBRC, Manesar  
Dr. Ravi S.M., Instem, NCBS, Bengaluru

**Harish Gupta Prize**

**Hall C**

**1.00 PM – 2.00 PM**

**LUNCH BREAK**

**2.00 PM – 3.00 PM**

**POSTER PRESENTATION-1 (P1-P190)**

**3.00 PM – 3.15 PM**

**TEA BREAK**

*28, November 2013 - 3.15 PM – 5.15 PM*

**Symposium 3**

**HALL A**

**Ageing in Health and Disease**

**Discussion Leaders:**

1. Dr. T Ramakrishna, Bengaluru
2. Dr. R. Sinha, Department of Physiology, AIIMS, Raipur

Sl.No.	Speaker	Affiliation	Title
1	Dr. Indira Jai Prakash	Former Professor of Psychology, Bangalore University, Bengaluru	Aging and Health in India: Current situation and Research Agenda
2	Dr. Kalluri Subba Rao	INSA–Hon. Scientist, School of Medical Sciences, University of Hyderabad, Hyderabad - 500046	Ayurvedic amalakirasayana therapy to experimental rats for extended period improves genomic stability in brain cells
3	Dr. I.S. Gambir	Professor and Head, Institute of Medical Sciences, Banaras Hindu University, Varanasi	Clinical Aspects of Aging
4	Dr. Sarada Subrahmanian	Additional Professor Department of Neurochemistry, NIMHANS, Bengaluru 560 029	Metabolic dysfunction and cognitive decline in aging brain: Strategies to improve cognitive health

28, November 2013 - 3.15 PM – 5.15 PM

**Symposium 4**

**HALL B**

**Physiological mechanisms underlying Yoga based rehabilitation programs**

**Discussion Leaders:**

1. Dr. Shirley Telles, Director of Research, Patanjali Research Foundation

SI.No.	Speaker	Affiliation	Title
1	Dr. S.R. Narahari	Director, Institute of Applied Dermatology, Kasaragod - 671124, Kerala, India.	Rehabilitation through yoga in lymphatic filariasis
2	Dr. Thimmappa Hegde	Director and Senior Consultant Neurosurgeon Narayana Hrudayalaya, Karnataka, India	Yoga and neuro-rehabilitation (the spiritual aspects )
3	Dr. R. Nagarathna	Medical Director, SVYASA, Bengaluru, Karnataka, India	Yoga and cardiac rehabilitation
4	Dr. Naveen K. Visweswaraiah	Joint Director of Research, SVYASA, Bengaluru & Executive Director, FAITHS, Bengaluru, Karnataka, India	Yoga for rehabilitation of occupation related disorders

**28, November 2013, 3.15PM – 5.15PM**

**ORAL PAPER PRESENTATION-1 (O1-O29)**

**HALL C**

**Chairpersons**

**Dr. Vinutha Shankar, Sri DevarajUrs Medical College, Kolar**

**Dr. Roopakala MS, M S Ramaiah Medical College**

**28, November 2013 6.00PM – 7.30PM**

**INAUGURATION**

**7.30PM – 8.30PM**

**Cultural Programme**

**28, November 2013 8.30PM – 10.30 PM**

**DINNER**



*29, November 2013 FRIDAY 9.00AM – 9.45AM*

**Plenary Lecture -2**

**HALL A**

**Chairperson**

**Laxmi T Rao, Department of Neurophysiology, NIMHANS, Bengaluru**

**Title: Enhancing, erasing, and tracing long-term memories by targeting PKMzeta**

**Speaker**

**Dr. Todd C. Sacktor,**

Professor of Physiology and Pharmacology,  
Professor of Neurology, M.D.(Albert Einstein College of Medicine),  
Brooklyn, NY

*29, November 2013 9.45AM – 10.15AM*

**Plenary Lecture -3**

**HALL A**

**Chairperson**

**Dr. R Sankaranarayanan, CEO, Vivo Tech Ltd., Hyderabad**

**Title: Nano particulated fluoroquinolones – an experience to  
develop ocular drug delivery**

**Speaker**

**Dr. Nihar R. Biswas,**

Professor of Pharmacology,  
AIIMS, New Delhi

**10.15AM – 10.30AM**

**Presentation by Elsevier – Health Sciences**

**HALL A**

**10.30AM – 11.00AM**

**TEA BREAK**

29, November 2013 11.00AM – 1.00PM

**Symposium 5**

**HALL A**

**Neurobiology and Pharmacotherapy in Addictive Behavior**

**Discussion Leaders:**

1. Dr. Seethalakshmi, Retd. Director Medical Education, Government of Karnataka
2. Dr. R Sankaranarayanan, CEO, Vivo Tech Ltd., Hyderabad

Sl.No.	Speaker	Affiliation	Title
1	Dr. Vivek Benegal	Professor of Psychiatry, Centre for Addiction Medicine, NIMHANS, Bengaluru – 560 029	Addiction is an epiphenomenon of a brain developmental disorder! Neurobiology of addiction
2	Dr. H. Chandrashekar	Professor and Head, Department of Psychiatry Bangalore Medical College and Research Institute fort, Bangalore – 560002	"Physiology of Addicted brain" why they lose their will power, why they are unable to control their own addictive behavior
3	Dr. Mahesh Gupta	Post-Graduate Institute of Medical Sciences, Rohtak	Alcohol de addiction - The Pharmacological Interventions
4	Dr. Atul Jain	Professor of Pharmacology, National Institute of Medical Sciences, Jaipur	Pharmacotherapy of alcohol dependence
5	Dr. Mrs. Chanda Kulkarni	Professor & Head, Clinical Pharmacology. St. John's Medical College, Bengaluru- 560034, India.	Scientific Basis of Drug Dependence: Advances in Target Oriented Pharmacotherapeutic Options

29, November 2013 11.00AM – 1.00PM

**Symposium 6**

**HALL B**

**Gastro-Intestinal Physiology: Research Opportunities at Indian Scenario**

**Discussion Leaders:**

Dr. K.K. Deepak, Professor of Physiology, AIIMS, New Delhi

Sl.No.	Speaker	Affiliation	Title
1	Dr. Maloy B. Mandal	Professor and Head, Department of Physiology, Institute of Medical Science, Banaras Hindu University, Varanasi, India	Human neonatal gut contractility studies in vitro
2	Dr. Purnima Sharma	Assistant Professor, Department of Physiology, AIIMS, Jodhpur	Brain-gut axis dysfunction in inflammatory bowel disease
3	Dr. Anuj Chawla	Col (Dr) AnujChawla MD DNB MNAMS FCGP Fellow (FAIMER, Phil USA), Professor and Head, Department of Physiology, Armed Forces Medical College, Pune 411040	Evaluation of Upper Gastro-Intestinal function: Challenges and Opportunities.
4	Dr. K.K. Deepak	Professor of Physiology, AIIMS, New Delhi	Autonomic dysregulation, psychologic insult and Gastrointestinal motility disorders

29, November 2013 11.00AM – 1.00PM

**Symposium 7**

**HALL C**

**Neurobiology of Cognition**

**Discussion Leaders:**

1. Dr. Madhavi Rangaswamy, Bengaluru
2. Dr. John P. John, NIMHANS, Bengaluru

1	Dr. Unnikrishnan Mazhuvancherry	Professor of Pharmacology, KMC, Manipal	Neural Plasticity on an Evolutionary Scale: Redeploying Mate Selection Skills towards Higher Cognitive Functions
2	Dr. H.N. Harsha	Professor of Physiology, KSHEMA, Mangalore	Remembering to remember – Prospective Memory
3	Dr. Sagnik Bhattacharya	Institute of Psychiatry, King's College London (KCL), UK	Using neuroimaging to investigate the modulation of cognition in man: "POT"ential mechanisms underlying Schizophrenia
4	Dr. Ludmila Sosulina	German Center for Neurodegenerative Diseases - DZNE AG Remy BMZ 1 - Gebäude 344 Sigmund-Freud-Str. 25 53105 Bonn	Substance P mediated effects in the mouse central amygdala.
5	Dr. C.K. Callaghan	Trinity College, Dublin, Dublin, Ireland	Manipulation of endogenous opioids with the novel compound RDC-2810 reverses depressive and cognitive symptoms in an interferon-alpha animal model of depression

**1.00PM – 2.00PM**

**LUNCH BREAK**

**2.00PM – 3.00PM**

**POSTER PRESENTATION-2 (P191-P392)**

**3.00PM – 3.15PM**

**TEA BREAK**

29, November 2013 3.15PM – 5.15PM

**Symposium 8**

**HALL A**

**Environmental Toxicology**

**Discussion Leaders:**

1. Dr. Mamta Naidu, Associate Investigator, Center of Cancer Systems Biology, GRI, Boston, MA, 02135, USA
2. Dr. SB Deshpande, Professor of Physiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India

Sl.No.	Speaker	Affiliation	Title
1	Dr. C Kesavachandran	Senior Scientist, Epidemiology Division, CSIR-Indian Institute of Toxicology Research, Lucknow, UP	Risk of Particulate Matter Pollutants on Lung Functions: An Indian Perspective
2	Dr. Shripad B Deshpande	Professor of Physiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India	Toxicity Induced by Environmental Toxin, Bisphenol A on Various Vital Organs in Rats
3	Dr. David Pawel	U.S. Environmental Protection Agency 1200 Pennsylvania Av., NW, MC 6608J Washington DC 20460	On Estimating Radiogenic Risk at Low Doses and Dose Rates for Cancer and Cardiovascular Disease
4	Dr. David Wilson	Senior Investigator Chief, Repair of Endogenous DNA Damage Section Laboratory of Molecular Gerontology Biomedical Research Center National Institute on Aging, NIH 251 Bayview Boulevard, Suite 100, Rm #06B117 Baltimore, MD 21224 USA	Elucidating the Role of Base Excision Repair in Disease Etiology
5	Dr. Mamta Naidu	Associate Investigator, Center of Cancer Systems Biology, GRI, Boston, MA, 02135, USA	Fractionated ionizing radiation skews differentiation of glial / oligodendrocyte progenitor cells and induces cognitive defects

*29, November 2013 3.15PM – 5.15PM*

**Symposium 9**

**HALL B**

**Cardiovascular Responses in Health and Disease**

**Discussion Leaders:**

Dr. Manish Bajpai, Professor of Physiology, King George's Medical University, Lucknow

Sl.No.	Speaker	Affiliation	Title
1	Dr. S.K. Maulik	Professor of Pharmacology, AIIMS, New Delhi	Transition from Physiological to Pathological cardiac hypertrophy: a potential target for Pharmacological Research
2	Dr. G.K. Pal	Professor and Head, Dept. of Physiology, Program Director, Advance Center of Yoga, JIPMER, Pondicherry - 605 006.	Association of sympathovagal imbalance and cardiovascular risks in health and disease.
3	Dr. Ashok Jaryal	Department of Physiology, AIIMS, Delhi	Chronic Kidney Disease and Renal Transplantation : Cardiovascular Effects
4	Dr. Madhusudhan S. Pal	Scientist-E, Defense Institute of Physiology and Allied Sciences (DIPAS), Delhi	Cardio-respiratory Responses of Military Load Carriage at Hostile Environments
5	Dr. Rasna Sabharwal	Internal Medicine, University of Iowa, Iowa City, IA, USA	Autonomic and Angiotensinergic Mechanisms in Muscular Dystrophy

*29, November 2013 3.15PM – 6.00PM*

**HALL C**

**Chairpersons: Dr. Karthiyanee Kutty, Sri DevrajUrs Medical College, Kolar**

**R. Srinivasan Prize**

**5.30PM – 7.00PM**

**GENERAL BODY MEETING**

**7.00PM – 10.00PM**

**BANQUET DINNER**

*30, November 2013 SATURDAY*

**HALL A**

**9.00AM – 9.30AM Plenary Lecture – 4**

**Chairperson: Dr. B.S. ShankaranarayanaRao, NIMHANS, Bengaluru**

**TITLE: Technological solutions to physiological problems: DIPAS perspective**

**Speaker**

**Dr. Shashi B. Singh**

Director,

Defence Institute of Physiology and Allied Sciences (DIPAS),  
Defence R&D Organization, Min.of Defence,  
Govt. of India, Lucknow Road,  
Timarpur, Delhi, India

*30, November 2013 9.30AM – 10.00AM*

**HALL A**

**Maj. Gen. S.L. Bhatia Oration Award**

**Prof. A.V. Kurpad, St. John's Medical College, Bengaluru**

**Chairperson: Dr. H.N. Mallick, AIIMS, New Delhi**

*30, November 2013 10.00AM – 11.00AM*

**AWARD SESSION**

**HALL A**

**Chairpersons: Dr. H.N. Mallick, AIIMS, New Delhi**

1. M.L. Gupta Prize
2. B.K. Anand Research Prize
3. Dev Raj Bajaj Research Prize
4. Dr. Shushila Thacker Prakruti Mandir Prize
5. Prof. R.C. Shukla Oration Award
6. Life Time Achievement award

**11.00 AM – 11.15AM**

**TEA BREAK**

*30, November 2013 11.15AM – 1.15PM*

## **Symposium 10**

### **HALL A**

#### **Nutrition and Air Pollution: Some Questions and caveats**

#### **Discussion Leaders**

1. Dr. Joseph Mukkadan, Director Research, Little Flower Hospital and Research, Angamaly, Kerala
2. Dr. Rajiv Gulati, Professor of Physiology, Ex Provost, NRSC, AMU

<b>Sl.No.</b>	<b>Speaker</b>	<b>Affiliation</b>	<b>Title</b>
1	Dr. Sunita Tiwari	Professor and Head of Physiology, King George's Medical University, Lucknow – 226003	Metabolic syndrome and nutrigenetic
2	Dr. Padmavathi Ramaswamy	Professor and Head of Physiology, Sri Ramachandra University, Chennai	Indoor air pollution – a significant but neglected Environmental Risk of Respiratory Diseases among women in developing countries
3	Dr. Rajiv Gulati	Professor of Physiology, Ex Provost, NRSC, AMU	Future exercise physiology in India: The role of Physiologists
4	Dr. Sucharita	Associate Professor and Head Clinical Physiology, St. John's Medical College, Bengaluru	Vitamin B12 and the life cycle - Physiological approaches
5	Dr. Sushil K Singh	Professor and Head, Department of Physiology, Pramukhswami Medical College, Karamsad, Gujarat	Anatomy, Biochemistry and Physiology of Happiness



*30, November 2013 11.15AM – 1.15PM*

**Symposium 11**

**HALL B**

**Research updates on Hormonal and Metabolic Diseases**

**Discussion Leaders**

Dr. B. Ganaraj, Additional Professor, Department of Physiology, KMC, Mangalore

Sl.No.	Speaker	Affiliation	Title
1	Dr. Madhulika Dixit	Assistant Professor, Department of Biotechnology, IIT Madras, Chennai	Insulin and Insulin Resistance: Ringleaders of endothelial dysfunction
2	Dr. Laxmi priya	Department of Biochemistry, MS University of Baroda, Vadodara, Gujarat, India	Polycystic Ovarian Syndrome and its therapeutic interventions
3	Dr. Sukanta Mondal	Senior Scientist, National Institute of Animal Nutrition and Physiology, Adugodi, Bengaluru	Stress and early embryo loss: Molecular cues from functional genomics
4	Dr. Narsingh Verma	Professor of Physiology, Head Department of Transfusion Medicine, Medical Superintendent GM and Associated Hospitals, KGMU, Lucknow	Light Exposure at Night: 24 hours chronomics of Ambulatory blood pressure and its relation with salivary cortisol & urinary 6-sulfatoxymelatonin (aMT6s) in night shift nursing professionals
5	Dr. Jennifer Rouine	Institute of Neuroscience, Trinity College, Dublin 2, Ireland	Investigation of cerebral perfusion changes following MDMA “Ecstasy” administration in an animal model using bolus-tracking arterial spin labelling MRI

*30, November 2013 - 11.15 AM – 1.15 PM*

**Symposium 12**

**HALL C**

**Neurophysiologic aspects of vestibular apparatus in aviation and space induced challenges**

**Discussion Leaders**

1. Dr. T.S. Roy, Professor and Head, Department of Anatomy, All India Institute of Medical Sciences, New Delhi - 110 029
2. Dr. G. Bhaumik, Scientist – E, Division of Head High Altitude Physiology Division, DIPAS, DRDO, Timarpur, Lucknow Road, New Delhi

Sl.No.	Speaker	Affiliation	Title
1	Gp. Capt (Dr) DK Dubey	Prof & Head, Dept. of Space and Environmental Physiology, Indian Aviation Medicine, Bengaluru	Vestibular apparatus and aerospace environment
2	Dr. B Sinha	Associate Professor, Department of Physiology, IAM, Indian Aviation Medicine, Bengaluru	Challenges faced by Astronauts and Pilots
3	Dr. D. Dey	Assistant Professor, Department of Physiology, Indian Aviation Medicine, Bengaluru	Prevention and countermeasures of SD in aviation

*Oral Paper Presentation – 2 (O30-O57)*

*11.00 AM – 1.00 PM*

**1st Floor of Convention Center**

**Chairpersons**

**Dr. Shraddha Singh, KGMU, Lucknow**

**Dr. Noorjehan Begum, Professor and HOD, VIMS, Bellary**

**1.15PM – 2.00PM**

**LUNCH BREAK**

30, November 2013 2.00PM – 4.00PM

## Pannel Discussion

HALL A

### DECADES OF RESEARCH IN PHYSIOLOGY AND PHARMACOLOGY : REMINDERS TO REMEMBER AND FOCUS

#### Convener

Dr. Laxmi T.Rao, NIMHANS, Bengaluru and Dr. T.N.Sathyaprabha, NIMHANS, Bengaluru

#### *Discussion Topics:*

1. Theme of the conference
2. Teaching curriculum in Physiology: Dr. K.P.Puthuraya
3. Evaluation Systems
4. Animal usage in practical curriculum
5. Critical introspection on research in Physiology
6. Provision for MD Physiology to do DM
7. Career opportunities for Physiologists and Pharmacologists
8. Medical education

#### *Panel Discussants*

1. Dr. K.P. Puthuraya, Professor of Physiology, MVJ Medical College, Hoskote – 562 114; Professor Emeritus, International Medical College, Bengaluru – 560 054
2. Dr. T. R. Raju, NIMHANS, Bengaluru
3. Dr. H.N. Mallick, Professor of Physiology, AIIMS, New Delhi
4. Dr. B. Vishwanatha Rao, Professor and Head, Madha Medical College, Chennai
5. Dr. M. Kutty, Registrar, Sri Devaraj Urs Medical College, Kolar
6. Dr. Y.K. Gupta, AIIMS, New Delhi
7. Dr. Sathya Subramani, Professor of Physiology, CMC, Vellore
8. Dr. Sudhakar H.H., Professor of Physiology, KIMS, Bengaluru
9. Dr. Venkatesh, MS Ramaiah Medical College, Bengaluru
10. Dr. Bindu M Kutty, NIMHANS, Bengaluru
11. Dr. K.K. Deepak, AIIMS, New Delhi

4.00PM – 5.00PM

#### *Concluding Remarks / Valedictory Function*

HALL A

#### AWARD DISTRIBUTION

1. R. Srinivasan Prize
2. Harish Gupta Prize
3. Winners of Quiz Competition
4. Best Poster Presentation

# *APPI Award Presentations*

## **MAJ. GEN. S.L. BHATIA ORATION AWARD**

Major General S.L. Bhatia Donated Rs. 10,000/- in the year 1976 to create an endowment for an Annual Oration Award to be given to an Indian Scientist of eminence who would have contributed substantially to the research and development in the field of Physiology, Pharmacology of the Allied Sciences through outstanding works primarily carried out in India.

### **Dr. A V Kurpad**

Professor Dept of Physiology,  
St John's Medical College, Bangalore.  
9689512233, e-mail : a.kurpad@sjri.res.in

.....

## **PROF. BALDEV SINGH ORATION AWARD**

Prof. Baldev Singh Oration Award for recognition of outstanding work carried out in the field of Neurophysiology / Neurosciences. This oration was instituted by the Faculty of the Dept of Physiology, AIIMS, New Delhi with a generous donation of Rs 25000.

## **PROF. M.L. GUPTA PRIZE**

In 1979, Prof. M.L. Gupta, Principal & Controller RNT Medical College Udaipur Instituted M.L. Gupta Prize in Medical Education and Technology for recognition of substantial contribution to Medical Education and Technology with special reference to Physiology / Pharmacology and Allied Sciences in India

### **Dr Shivaprasad S Goudar**

Professor of Physiology & Research Coordinator  
Women's and Children's Health Research Unit  
KLE University's Jawaharlal Nehru Medical  
College, Belgaum 590010 Karnataka India  
Cell: +91 94481 26371  
E Mail: sgoudar@jnmc.edu

---

## **DR. B.K. ANAND RESEARCH PRIZE IN PHYSIOLOGY**

Dr. B.K. Anand, Found member of APPI donated Rs. 5000/- in the year 1976 to creation endowment from the proceeds of which an annual cash/Prize/Medal will be given to young Indian Scientist below the age of 40 years for the best paper in Physiology submitted during the year.

### **Dr Jayanti Pant**

Asst. Professor  
Department of Physiology  
Govt. Med. College, Rampur Road, Haldwani – 263139  
9897470789, Email:pant.jayanti@gmail.com

## **C.L. MALHOTRA RESEARCH PRIZE IN PHARAMACOLOGY**

Dr. C.L. Malhotra Founder Member of APPI offered Rs. 5000/- in 1976 to creation endowment from the proceeds of which an annual cash/medal will be given to an Indian Young Scientist below the age of 40 years for the best paper submitted in Pharmacology during the year.

### **Dr J. N. Singh**

Scientist Gr.-II, Department of  
Pharmacology and Toxicology NIPER,  
SAS Nagar Punjab, 99888 23116  
E-mail jnsingh@niper.ac.in & jitnsingh@gmail.com

.....

## **DEV RAJ BAJAJ RESEARCH PRIZE IN TECHNIQUES/ INSTRUMENTATION FOR THE BEST PAPER SUBMITTED ON THE DEVELOPMENT OF NEWER TECHNIQUES/ INSTRUMENTATION IN PHYSIOLOGY/ PHARMACOLOGY / ALLIED SCIENCES**

### **Dr. Kiran Prakash**

Demonstrator, Department of Physiology  
GMCH-32, Chandigarh, Mobile No. – 8727855847  
Email ID – kiranprakash009@gmail.com

**A.V. TILAK PARVATHI DEVI PRIZE FOR THE BEST PAPER  
IN ENDOCRINOLOGY/ NEURO ENDOCRINOLOGY**

**A.N.Balamurugan, PhD**

Director, Islet Core  
Associate Director, Islet Transplant  
Program Schulze Diabetes Institute,  
Assistant Professor of Surgery University of  
Minnesota, Minneapolis, MN 55455  
Phone: 651-253-0656, E-mail: bala@umn.edu

.....

**SUSHILA THAKER PRAKRITI MANDIR PRIZE FOR RESEARCH  
INVESTIGATION IN THE FIELD OF NATURAL HEALTH,  
NATUROPATHY & YOGA**

**Dr. Sriranjini S Jaideep MD (Ayurveda)**

PhD (NIMHANS)  
Senior Research Associate  
Center for Clinical Research  
Institute of Transdisciplinary Health  
Sciences and Technology  
#74/2, Jarakabande Kaval, Post Attur, Via Yelahanka  
Bangalore-560106  
Email: drsriranjini@gmail.com



**PROF. R. C. SHUKLA ORATION AWARD FOR BEST PAPER  
IN CARDIOVASCULAR PHYSIOLOGY**

**Dr. Manpreet Kaur, MD**

Senior Resident, Department of Physiology  
All India Institute of Medical Sciences, New Delhi.  
drmanpreet.kaurghai@gmail.com,  
Ph: +919582291252

.....

**PROF. K.P PUTHURAYA AWARD FOR THE BEST TEACHER IN PHYSIOLOGY**

**Dr Anuj Chawla, Professor and Head**

Department of Physiology, Armed Forces

Medical College, Pune 411040

Email: ltcolanuj@gmail.com

Dr Sunita Tiwari

Prof & Head Physiology

KGMU, Lucknow 226003

9415023461 (Mob.)

e-mail: sunita\_kgmu@yahoo.com

## **GK PAL AWARD**

**S. MONDAL**

Senior Scientist

National Institute of Animal Nutrition  
& Physiology

Adugodi, Bangalore

Email:sukanta781@gmail.com



## **BEST BRANCH AWARD**

**Belgaum Branch**

**Dr.S.S.Vernekar**

**Secretary, APPI-Belgaum branch**

JN Medical college, Belgaum

Email:dr.nehaskulkarni@gmail.com

**H. H. LOESCHEKE RESEARCH PRIZE IN TECHNIQUES /  
INSTRUMENTATION  
FOR THE BEST PAPER IN RESPIRATORY PHYSIOLOGY**

.....

**LIFE TIME ACHIEVEMENT AWARD**

**DR. SHARMA K.N.**

(Res) No. 503, 12th Cross 6th 'A' Main

Email: drkns@msrsas.org

HIG Colony, RMV II Stage,

BANGALORE-560 094 [KARNATAKA]

Email: drkns@msrsas.org



# Keynote Address

## New Science of Man

### Prof. B. M. Hegde

MD, PhD, FRCP (Lond.Edin, Glasg., and Dublin),  
FACC,FAMS, Padma Bhushan Awardee

Prof. Belle Monappa Hegde is a physician par-excellence, an astute clinician and a teacher in the true Guru tradition. Prof. Hegde's encyclopaedic knowledge, brilliant oratorical skills and natural instinct to teach have endeared him to generations of students and teachers across the globe.

Prof. B.M. Hegde was born on 18<sup>th</sup> August, 1938. Sri V. Shankar Hegde and Smt. Chandravathi were his parents. After his early education at Hiriadka and Udupi, Prof. Hegde proceeded to Madras for his medical education. Through out his tenure as a medical student at Stanley Medical College, Madras, Prof. Hegde was a brilliant student and had received a Gold medal and a special prize in surgery from Madras University. He did his M.D. (Medicine) from Lucknow University with scholarship of Govt. of India. Subsequently, he went to England on Commonwealth Fellowship and had passed the Membership of Royal College of Physicians of UK examination. He then underwent advanced training in Cardiology at Harvard Medical School, Boston under Nobel Laureate Bernard Lown; and at the National Heart and The Middlesex Hospitals in London under Late Walter Somerville and Late Richard Emanuel. He is now the Fellow of all Royal Colleges and the American College of Cardiology.

Prof. Hegde started his teaching career as a tutor in 1962 in Manipal. He then served the Kasturba Medical College, Mangalore and Manipal for 45 long years, occupying with distinction the posts of Professor of Medicine, Director PG studies, Principal, Dean, Pro- Vice Chancellor and, the Vice-Chancellor of Manipal University.

Prof. B.M. Hegde's academic brilliance has been recognized globally. He is Affiliate Professor of Human Health (University of Northern Colorado); and Former Professor of Cardiology (The Middlesex Hospital Medical School, University of London). He is also the Chairman, State Health Society's Expert Committee, and Govt. of Bihar. He has been the visiting Professor to number of universities in India and many countries abroad.

Prof. Hegde has been the recipient of numerous National and International Awards. To name a few: Dr. B.C.Roy National Award for being an Eminent Medical Teacher, Dr.J.C.Bose Award for Life Science Research, Pride of India Award from the US, Distinguished Physician of India Award from A.P.I, Healer

of Mankind Award (Symbiosis University, Pune), Vaidya Ratnakara award (Shankaracharya of Swarnvalli Mutt., Karnataka Rajyothsava Award among many others. Prof. Hegde has been examiner for the MRCP (UK) and MRCPI (Dublin) examinations. Prof. Hegde's monumental contributions to the art of bedside clinical examination regarding "how to detect early splenic enlargement", "auscultation for mitral valve prolapse" and "how to assess the second heart sound with the stethoscope correctly" have been published in prestigious medical journals, such as, The Lancet, The German Tribune, The Practitioner and the JRCP (London) over the years and two of these have been cited in the American College of Physicians book on Bed side diagnosis.

Prof. Hegde is a prolific writer and his articles are frequently published in various magazines and newspapers and his talk shows are sought after in the electronic media. Prof Hegde has penned nearly 35 books and over 3,000 articles in lay press. During the last decade, Prof. Hedge along with 15 world renowned scientists, some of them Nobel Laureates, has been publishing a journal titled "Journal of the Science of Healing Outcomes", of which he is the Founder Editor-in-Chief. Late Prof. Rustom Roy, considered to be the father of nanoscience, was Prof. Hegde's mentor and had helped Prof. Hegde to start the journal. Professor Hegde's service to the society through Bharatiya Vidya Bhavan and its activity are legendary.

In 2010, Prof B.M. Hegde was conferred the prestigious Padma Bhushan Award by the President of India.

In recognition of his outstanding contributions as a dedicated teacher in the true Guru tradition, a physician par excellence, original researcher, a medical philosopher, and an able administrator, the Sri Venkateswara Institute of Medical Sciences (State University) was pleased to present Professor B.M.Hegde to the Chairman for the award of the Honorary Degree of Doctor of Philosophy (PhD. Honoris Causa) in 2011.

# Plenary Lecture





## Recent advances in islet cell transplantation

**Dr. A.N. BALAMURUGAN**

Director, Islet Core,  
Associate Director, Islet Transplant Program,  
Schulze Diabetes Institute [Formerly : Diabetes Institute for Immunology and  
Transplantation], Assistant Professor of Surgery,  
University of Minnesota, Minneapolis, MN 55455

## Enhancing, erasing, and tracing long-term memories by targeting PKMzeta

**TODD SACKTOR**

Professor of Physiology and Pharmacology, Professor of Neurology, M.D. (1982, Albert Einstein College of Medicine), Brooklyn, NY

Most molecular targets for the manipulation of memory focus on the signaling events that initiate memory formation during the brief time window of memory consolidation, or following the reactivation of memory, during reconsolidation. Targets for maintaining the long-term memory trace after consolidation have been unknown. Recently, however, the persistently active atypical PKC isoform, PKMzeta, has been identified as a potential component of the molecular mechanism maintaining the long-term memory trace. Pharmacological or genetic inhibition decreasing PKMzeta activity disrupts both new and established long-term memories, whereas increasing PKMzeta enhances both new and established memories. Localizing increases of PKMzeta within specific circuits of the brain days to weeks after memory consolidation gives the first indication of how the biological trace of long-term memories are stored and can be erased and enhanced.

## Nanoparticulated Fluroquinolones- an experience to develop ocular drug Delivery

**N.R. BISWAS**

Department of Pharmacology,  
All India Institute of Medical Sciences, New Delhi, India

Nanoparticles for the purpose of drug delivery have definite advantages because of their high stability, high carrier capacity and feasibility of incorporation of both hydrophilic & hydrophobic substances. The nanoencapsulated forms of drugs, due to their improved pharmacokinetic properties are expected to show higher efficacies and low MICs against the microorganisms and animal model infections as compared to conventional drugs. Therefore, the present study was aimed to evaluate the efficacy of topical nanoparticulated sparfloxacin and plain sparfloxacin in the experimental model of corneal ulcer. Washed diachema membrane was kept on each cell of diffusion chamber fitted with continuous slow injector. Transmembrane resistance confirmed intact membrane. Speed was maintained at 160 mins / inch. Chamber was maintained at 36°C. Hundred ml (300 µg sparfloxacin equivalent) of drug was loaded in each cell. Samples were collected in a pre-weighed microcentrifuge tube at ½, 1, 2, 4, 6, 7 & 24 hrs. They were reweighed and volume was determined via density calculation. Collected samples were stored at 70 °C till further analysis by HPLC. Eight white albino rabbits weighing 1.5-2 kg body weight were procured from Institute's Animal House after the approval of the Institute's Animal Ethics Committee for the use of corneal ulcer efficacy study. Sterile saline (0.05 ml) containing Staph. aureus 5x10<sup>6</sup> CFU per ml was injected in the cornea for the induction of corneal ulcer. Cornea was anaesthetized with 4% xylocaine before performing the intra-stromal delivery of the inoculums. Therapy was initiated after 18 hrs of the inoculation. The rabbits, which were having at least grade 1 ulcer, were included in the study. Each rabbit received 50 µl of either 0.1% w/v nanoparticulated sparfloxacin formulation or plain 0.3% sparfloxacin eye drop four times a day. Treatment was given for 4 weeks. In our in vitro release study of nanoparticulated sparfloxacin, it was found that Formulation IV (sparfloxacin 8% loaded) was found to be the best which was used for the in vivo kinetic study. While comparing the percentage healing that occurred after two weeks of therapy, (using the ulcer size) nanoparticulated sparfloxacin (0.1% sparfloxacin) showed 100% healing over the period of 4 weeks treatment, which was found to be statistically significant (p<0.01), when compared to the plain sparfloxacin. Nanoparticulated sparfloxacin has been shown to possess 15 times low MIC 90 value as compared to plain sparfloxacin against Staph. aureus. This study showed that nanoparticulated formulation may be having potential use in ocular drug therapy.

# TECHNOLOGICAL SOLUTIONS TO PHYSIOLOGICAL PROBLEMS: DIPAS PERSPECTIVE

**SHASHI BALA SINGH**

Professor of Physiology, DIPAS, New Delhi

Indian boundaries are delimited by diverse geographical locations ranging from frozen Himalayan peaks lacking oxygen to hot and dry deserts to hot and humid coastal areas to dense jungles. Indian soldiers are deployed in these varied environmental conditions and are subject to the detrimental effects of these extreme environmental excesses. In addition, the noise and radiation exposure of the troops is a significant occupational hazard. The troops of the Indian Defence Forces are not only expected to survive these extremes but also to perform physically and mentally to discharge their military duties effectively.

DIPAS has been working in the field of military physiology for past fifty years with the primary mandate of promoting human performance in extreme environments. Neurophysiological mechanisms of anorexia, High Altitude Pulmonary Edema, cold injuries, memory impairment, sleep pattern at high altitude have been elucidated for developing preventive/ therapeutic measures. We have undertaken various approaches to devise strategies and products to improve performance of soldiers to combat physiological stresses posed by harsh environments.

Cold, hypoxic environment of High Altitude: For treating patients of AMS and HAPE and for persons visiting high altitude for shorter duration, a system for improving oxygenation is developed in the form of hyperoxic shelters. Nitric Oxide Delivery System for treatment of HAPE has also been optimized along with formulating Aloe Vera based Alocal cream to treat/ prevent cold injuries. Acclimatization schedule and tenure of posting to aid in the rapid acclimatization of soldiers to high altitude has been prepared. We have also undertaken sleep studies for ameliorating the effects of sleep deprivation and disturbed sleep at the extremes of altitude. Electrically heated gloves and socks are developed for the extremely cold conditions at HA. Sourja, a self sustained solar shelter designed by DIPAS that can generate power in all weather conditions using solar/wind energy and provides zero energy based habitability under inhospitable environment. Improved Space Heating Devices (Bukhari) have been designed that uses

nearly half fuel and does not build CO in the room where it is used, thus making it safe and cost effective. We have tailored Yoga packages for the Armed forces for their performance improvement.

Hot and dry/ humid climate of Deserts/ Coastal regions/ Dense Tropical Jungles: Hypohydration and the resultant loss of water and electrolytes from the body are the major threats to human physiology in these environments. Soldiers need to acclimatize to the heat in order to survive in these border areas. DIPAS has designed Vortex cooling systems for desert operations to combat heat stress. Tanks provide a heated microclimate for the soldier operating in it, to provide comfort to the tank crew operating in extreme hot conditions, we made a solid state cooling garment for the tank crew.

Occupational stress environment: Soldiers are constantly exposed to high intensity noise of firing, aircrafts, tanks, etc and it is imperative to reduce the noise induced hearing loss to safeguard them. DIPAS has made Carbogen Breathing System with 5% CO<sub>2</sub> and 95% O<sub>2</sub> that upon inhalation reduces the risk of noise induced hearing loss.

Samudrasuta, an indigenous hyperbaric chamber is developed for research on underwater physiology & medicine, treatment of decompression illness, hyperbaric oxygen therapy for carbon monoxide poisoning, post-operative recovery and treatment of certain type of malignancies.



## **The Effect of Glycodelin on the Cytolytic Activity of CD8<sup>+</sup> T Lymphocytes: Implications in Primate Pregnancy**

**Anjali A Karande**

Department of Biochemistry, Indian Institute of Science, Bangalore 560012

Glycodelin A (GdA) is a glycoprotein that is synthesized by the endometrium under progesterone regulation. GdA has been documented to play an important role in the down-modulation of the maternal immune response to fetal allo-antigens; therefore, is indispensable for the maintenance and progression of pregnancy. Earlier studies from our laboratory have focused on the effect of glycodelin on T helper cells: the key regulators of both the arms of the acquired immune system. Data revealed that glycodelin induces apoptosis in activated T cells through a caspase-dependent intrinsic mitochondrial pathway. Though cytotoxic T cells are few in the peripheral blood circulation, their number is high at the site of implantation. Therefore studies were initiated to determine the effect of GdA on CD8<sup>+</sup> T cells as well as cytotoxic T cells. GdA was found to inhibit the proliferation of CD8<sup>+</sup> T cells but does not trigger apoptosis in them.

## **Evaluation of Upper Gastro-Intestinal function: Challenges and Opportunities.**

**Col (Dr) Anuj Chawla MD DNB MNAMS FCGP Fellow (FAIMER, Phil USA)**

Professor and Head, Department of Physiology, Armed Forces Medical College. Pune 411040

Gastro-oesophageal reflux disease (GERD) is a fairly common occurrence. Symptoms, attributed to GERD may at times, be due to a non-GI aetiology. The classical epigastric discomfort in some patients of myocardial ischemia or acute myocardial infarction is a case in point. A proper evaluation of upper GI function thus becomes imperative to establish a cause and effect relationship.

GI function can be assessed from a structural and a functional point of view. With advances in imaging and endoscopic techniques, it is possible to visualise almost any part of the gut today. Interestingly, at times, structure and function do not mirror each other and it is in this context that a functional evaluation of the GI system assumes great importance.

High Resolution Upper GI Manometry (HRM) and 24-hour ambulatory pH-metry are two important tests of upper GI function. Properly performed and interpreted, these tests along with imaging/endoscopy can establish a credible diagnosis in most cases.

This paper presents an analysis of data from 125 patients with symptoms of upper GI dysfunction evaluated at the GI Physiology laboratory at AFMC Pune. Interestingly, 77% of patients referred with symptoms of dyspepsia were found to have normal oesophageal motility on HRM, while 67% patients with dysphagia were diagnosed as Achalasia Cardia. Of the patients clinically diagnosed as GERD, 26% were found to be normal on 24 hour ambulatory pH metry. The paper thus highlights the critical role played by the functional evaluation in the management of these cases and discusses the possible areas of research in this field.

## **Chronic Kidney Disease and Renal Transplantation : Cardiovascular Effects**

**Ashok Jaryal**

Department of Physiology, AIIMS, Delhi

The progressive decrease in glomerular function during the course of chronic kidney disease (CKD) leads to disruption of homeostatic machinery affecting all the organ-systems of the body. From clinical standpoint,

cardiovascular complication is the most common cause of morbidity and mortality in chronic kidney disease. The functional assessment of cardiovascular system shows a progressive loss both at the level of end-organ as well as in the regulatory component of the system as the CKD worsens. The recent literature and our own studies—ranging from early stages to end stage renal disease patients and on different modalities of treatment ranging from peritoneal dialysis, hemodialysis to renal transplant have provided some important clues regarding the cardiovascular pathophysiology of renal disorders.

From technology point of view, the functionality of the cardiovascular system can be assessed by measures of baroreflex sensitivity, variability in heart rate and blood pressure, endothelial function and arterial stiffness over and above the other tools like electrocardiography, echocardiography, stress testing and measurement of cardiac output.

In the present talk, I propose to explain the principle of the functional measurements, show the data obtained by others and our group, and propose a working model for the development of cardiovascular changes in the patients of CKD. The deranged internal-milieu as a consequence of CKD leads to stiffening of the vascular walls and loss of endothelial function. This manifests as increase in vascular tone, loss of baroreflex sensitivity resulting in increase in blood pressure variability and increase in augmentation index. Over time these changes leads to increase workload on heart and end-organ predisposing them to clinically evident events.

## Pharmacotherapy of Alcohol Dependence

**Atul Jain**

The role of adjuvant pharmacotherapy in optimising outcome in rehabilitation programmes for alcohol-dependent patients has become increasingly evident over the last two decades,. New avenues for rational drug treatment have arisen from better understanding of the neurobiological substrates of alcohol dependence, including adaptive changes in amino acid neurotransmitter systems, stimulation of dopamine and opioid peptide systems, and, possibly, changes in serotonergic activity. The traditional goal of treatment for alcohol dependence is abstinence, which remains a primary treatment focus. In addition, reduction of heavy drinking has become accepted as an alternative treatment goal. Reduction of heavy drinking may be a more acceptable goal for some patients who lack readiness to quit drinking

Pharmacotherapy, in conjunction with psychosocial interventions, is emerging as a valuable tool for alcohol dependence treatment. Currently, four agents are highly recommended for this purpose: disulfiram, acamprosate, oral naltrexone, and the once-monthly injectable, extended-release naltrexone. All four agents have demonstrated some ability to reduce drinking and/or increase time spent abstinent, but results have not always been consistent. Except disulfiram, which has an aversive mechanism of action, effective pharmacotherapies for alcohol dependence are thought to work by blocking the rewards of alcohol or stabilizing systems dysregulated by chronic alcohol intake. Naltrexone is thought to decrease relapse to heavy drinking by attenuating the rewarding effects of alcohol. Another opioid receptor antagonist, nalmefene, has shown promising activity in pilot studies, and may have a similar profile to naltrexone. Acamprosate is believed to maintain abstinence by blocking the negative craving that alcohol-dependent patients experience in the absence of alcohol. The clinical development programme has involved a large number of patients and studies, of which the vast majority have shown a beneficial effect of acamprosate on increasing abstinence rates. Data from studies of SSRIs in alcohol dependence are somewhat heterogeneous, but it appears that these drugs may indirectly improve outcome by treating underlying depression rather than affecting drinking behaviour *per se*. Similarly, the anxiolytic buspirone may act by ameliorating underlying psychiatric pathology. Topiramate has also demonstrated some efficacy in treating alcohol dependence. Dopaminergic neuroleptics, benzodiazepines and antimanic drugs have



not yet demonstrated evidence of activity in large controlled clinical trials. Trials with drugs acting at serotonin receptors have yielded disappointing results, with the possible exception of ondansetron. The efficacies of many of these regimens are modest and are limited by patient nonadherence to treatment and disease heterogeneity.

Pharmacotherapeutic effectiveness could be enhanced through increased knowledge of the pathophysiology of alcohol dependence, through the identification of predictors of response to specific medications, and by modalities that improve medication adherence. Because the biological basis of alcohol dependence appears to be multifactorial, the future of management of alcoholism may be combination therapy, using drugs acting on different neuronal pathways, such as acamprosate and naltrexone. Pharmacotherapy should be used in association with appropriate psychosocial support and specific treatment provided for any underlying psychiatric comorbidities.

## **Manipulation of endogenous opioids with the novel compound RDC-2810 reverses depressive and cognitive symptoms in an interferon-alpha animal model of depression**

**C.K. Callaghan, S.M. O'Mara.**

Trinity College, Dublin, Dublin, Ireland

The role of the opioid system in regulating pain, reward and addiction is well documented, but its role in influencing other emotional and cognitive behaviours is poorly understood. The  $\mu$ -,  $\delta$ - and  $\kappa$ - opioid receptors are responsible for the effects mediated by opioid agonists and antagonists. RDC-2810 is an opioid receptor modulator with potential anti-depressive properties.

Here we used an interferon-alpha (IFN $\alpha$ ) induced animal model of depression to evaluate the potential efficacy of targeting the endogenous opioid system for therapeutic effects. Rats (3mth male han Wistar) were injected 3 times weekly with recombinant human IFN $\alpha$  for 4 weeks. During this time some animals were exercised 3 times (1hr treadmill running) per week or remained sedentary. Rats were further allocated into groups treated with RDC-2810 (0.3mg/kg/sc) or vehicle (saline) 3 times per week. At the end of this protocol animals were tested for depressive behaviour in the forced swim test (FST) and open field exploration and for cognitive function with an object exploration task.

Animals treated with IFN $\alpha$  alone were found to have increased immobility time in the FST and this was prevented by exercise protocol or treatment with RDC-2810. Further, in the object exploration task, animals treated with IFN $\alpha$  alone had a spatial memory deficit and this was attenuated by exercise or RDC-2810 treatment. Although recognition memory remained intact in the IFN $\alpha$  treated animals, those receiving RDC-2810-05 performed significantly better in this part of the task.

Together this data supports the hypothesis that modulation of the opioid system may serve as a potential therapeutic avenue in the quest to find a treatment for depression.

This Research was funded by Alkermes.

## **Scientific Basis of Drug Dependence: Advances in Target Oriented Pharmacotherapeutic Options**

**Chanda Kulkarni**

**Professor & Head, Clinical Pharmacology, St. John's Medical College, Bangalore: 560034. India.**

E-mail: drchandakulkarni@gmail.com Drugs of dependence produce major psychosocial problems and are known to have a serious impact both on the individual and society. There has been a recent and rapid increase

in crime rate related to drug dependence among adolescents globally. A large number of drugs abused include – recreational drugs, stimulants, dope drugs, prescription drugs etc. There are approximately five million addicts in India.

Although, drug abusers have their choice of drug, poly-drug dependence is more common complicating the diagnosis, making drug treatment difficult as well as empirical. Several models and theories have been proposed and evaluated using various animal models to explain etio-pathogenesis of drug dependence. The phenomenon of drug dependence appears to be multifactorial involving several receptors and neurochemical mechanisms leading to pathological changes in the CNS and hence is now regarded as a 'BRAIN disease'.

Developing newer pharmacotherapeutic agents is hence necessary for appropriate management of dependence. The recent advances in evaluation of new therapeutic molecules is based on current concepts and understanding of dependence behavior. Therefore, educating health care professionals on basic concepts may be anticipated to help in not only designing but also identifying rational therapeutic approaches to the growing problem of drug dependence. Therefore target oriented novel and patient friendly pharmaceuticals, and ultimately to achieve significant harm reduction.

This presentation will cover recent advances in etipathogenesis of drug dependence with special emphasis on - the present and futuristic therapeutic options.

Corresponding address: Dr. Mrs. Chanda Kulkarni. MD; PhD; FSASMS, Professor & Head, Clinical Pharmacology, St. John's Medical College, Bangalore: 560034. India. E-mail: drchandakulkarni@gmail.com

### **“Physiology of Addicted brain” why they lose their will power, why they are unable to control their own addictive behavior**

**H. Chandrashekar**MD(*psy*),PGDMLE(NLSIU,

**Professor and Head, Department of Psychiatry, Bangalore Medical College and Research Institute fort,Bangalore – 560002**

The lecture will focus on physiological dependence; tolerance, withdrawal symptoms, Neglect of alternate pleasurable activities and aggression ,the centers involved in production of these symptoms, methods to counter act these symptoms. I will also talk on mechanism of action of deterrent agents precautions, consent and ethical principles involved. Also touch upon minimum facilities to be provided in de-addiction centers, how to start treatment against their will.

### **On Estimating Radiogenic Risk at Low Doses and Dose Rates for Cancer and Cardiovascular Disease**

**David Pawel**

U.S. Environmental Protection Agency, 1200 Pennsylvania Av., NW, MC 6608J, Washington DC 20460

U.S. Environmental Protection Agency (EPA) recently updated projections of radiogenic cancer risk pertaining to low dose and dose rates. Most of the risk estimates were calculated using models recommended in the National Academy of Sciences' BEIR VII report. These models were largely based on epidemiological data from the Life Span Study (LSS) of Japanese atomic bomb survivors, who received an acute dose of radiation. For most cancer sites, excess relative and absolute risks were modeled according to the linear, no-threshold (LNT) response model in which the risk of inducing a cancer in an irradiated tissue by low dose of radiation is proportional to the dose to that tissue. For cancer, results from both epidemiological and radiobiological studies are consistent

with LNT. For cardiovascular disease, the LSS provides evidence of radiogenic risk, but a dose “threshold” cannot be ruled out. An important strength of the LSS is a wide range of fairly accurately known individual radiation doses, with well-established methods to account for the impact of dose uncertainties on health effect estimates. For other epidemiological studies of radiogenic health effects, particularly those involving internal emitters, the “measurement error” problem on how to account for dose uncertainties presents more difficult challenges.

Author contact information: U.S. Environmental Protection Agency, 1200 Pennsylvania Av., NW, MC 6608J, Washington DC 20460, Email: pawel@verizon.net

## Elucidating the Role of Base Excision Repair in Disease Etiology

**David M. Wilson III, Ph.D.**

Senior Investigator, Chief, Repair of Endogenous DNA Damage Section, Laboratory of Molecular Gerontology, Biomedical Research Center, National Institute on Aging, NIH, 251 Bayview Boulevard, Suite 100, Rm #06B117, Baltimore, MD 21224 USA, wilsonda@mail.nih.gov; <http://www.grc.nia.nih.gov/branches/lmg/dwilson.htm>

The major DNA repair pathway for coping with spontaneous forms of DNA damage, such as natural hydrolytic products or oxidative lesions, is base excision repair (BER). In particular, BER processes mutagenic and cytotoxic DNA lesions such as non-bulky base modifications, abasic sites, and a range of chemically distinct single-strand breaks. Homozygous knock-out of a core BER component leads to embryonic/post-natal lethality in mice; yet specific defects in BER have been connected with cancer predisposition, neurodegenerative disorders, and immunodeficiency. Given that severe loss of a central participant in BER is incompatible with life, we postulate that more mildly reduced BER capacity will be associated with disease risk, most likely in a lifestyle- or exposure-dependent manner. I will present an overview of the extent of BER capacity variability within the population and discuss our efforts to delineate the functional consequences of nonsynonymous nucleotide substitutions found in the healthy and disease population. I will also review the current state of BER capacity measurement assays. Developing appropriate technologies and basic mechanistic insight represent vital steps in elucidating the contribution of BER efficiency and efficacy in disease etiology and the aging process.

## Endometrial receptivity toward blastocyst implantation in the primate: A middle out view

**Debabrata Ghosh<sup>1</sup> and Jayasree Sengupta<sup>2</sup>**

<sup>1</sup>Department of Physiology, All India Institute of Medical Sciences, New Delhi 110029; <sup>2</sup>Department of Physiology, North DMC Medical College, Delhi 110007

The physiology of endometrial receptivity to blastocyst implantation in the primate involves complex process. In one hand, the luteal phase progesterone is *sine qua none* for blastocyst implantation in the primate. Progesterone execute the *top-down* control of functions to prepare the endometrium for embryo implantation that occurs during the receptive period of the mid-luteal phase of the menstrual cycle. Insufficient progesterone action or functional starvation of progesterone at the endometrial *functionalis* zone by the timed administration of very low dose of anti-progestin may make endometrium refractory to embryo implantation. On the other hand, developing embryo in the *bottom-up* way manages to execute cross-talk with implantation-stage endometrium to establish functional synchrony between the two interacting entities: embryo and endometrium. This notion is corroborated by the observed loss of endometrial maturation in the absence of viable embryo. Using the model of relative progesterone starvation with and without viable embryo in the uterine lumen, we have performed multi-parametric analysis of the endometrium of the rhesus monkey to undertake a *middle-out* exploration of relative contribution of progesterone, *vis-à-vis*, embryonic inputs at the expression level towards endometrial preparation for embryo implantation.

## **Autonomic dysregulation, psychologic insult and Gastrointestinal motility disorders**

**K K Deepak**

Professor, Dept of Physiology, All India Institute of Medical Sciences. New Delhi 110029, Email: kkdeepak@gmail.com

Autonomic dysregulation and chronic stress may result in several physiological consequences in body. The effect of continuing stress may represent a transitional spectrum of autonomic manifestation that may affect gastrointestinal (GI) motility. We have carried out several studies to find out association between the existence of anxiety status and status of autonomic functions in clinical disorders known to be associated with morbid psychology. The diseases included irritable bowel syndrome (IBS), duodenal ulcer (DU) and non-ulcer dyspepsia. In IBS, we found existence of heightened anxiety and increased parasympathetic reactivity. In one more larger study we found that patients of irritable bowel syndrome showed extremely high level of anxiety scores. The treatment with yogic intervention resulted in significant decrement in anxiety level when compared to conventional treatment with drugs. Intervention by using electrogastrigraphy (EGG) biofeedback resulted in improved gastric motility. In the cases of anal incontinence we also used pressure signal from anus to use as biofeedback signal to improve their symptoms. In the patients of duodenal ulcer, we found low anxiety scores on Spielberger's STAI and lowered sympathetic reactivity during active but non-bleeding stage. The study suggested that in DU patients, the psychological status exhibits resistant to change. In the case of Non-Ulcer Dyspepsia (NUD), we found decreased sympathetic and parasympathetic reactivity. The resting sympathetic tone was lower in patients with NUD as compared to control subjects. The correlation results indicate dysregulation of systemic autonomic control (predominantly sympathetic) and gastric amplitude changes, which affect the gastric myoelectric response to a natural stimulus. Such autonomic dysregulation could be responsible for genesis of symptoms in NUD patients.

From these studies it emanates that the psychologic insult, autonomic dysregulation and gastrointestinal symptoms are maintained by common interacting mechanism. By and large it is a patterned response. It appears that during the course of a disease there is a shift from sympathetic over-activity to depressed sympathetic activity. Consecutively or simultaneously, the parasympathetic hyperactivity appears and manifests through one or more features of so called "parasympathetic stress reaction". The investigations of autonomic function vis-e-vis psychological factors and GI motility are certainly going to be rewarding in terms of delineating the mechanisms leading to development of GI motility disorders.

[The studies cited here were supported by CCRYN and AIIMS intramural research grant]

## **PREVENTION AND COUNTERMEASURE OF SD IN AEROSPACE ENVIRONMENT**

**D DEY**

Prevention of SD in aviation includes: Repeated exposure to Instrument flying and use of the autopilot; Education and Training; Use of 'Head Up Display', 'Night Vision Goggles'; Good mental and physical health, adequate sleep, sufficient flying experience with repeated exposure to flight stresses and emergencies.; Situational awareness.

While, prevention of SD in space includes: the preventive strategies include training, in-flight techniques for minimizing head and body movement, and use of anti-motion sickness drugs.

## **VESTIBULAR APPARATUS AND AEROSPACE ENVIRONMENT**

**DK DUBEY**

Vestibular apparatus is a sensorimotor organ operating at the subconscious level to maintain balance, keep orientation in the space, co-ordinate and stabilize vision during movements of the head. The otolith organs provide information about the position of head relative to gravity (that is static head tilt) and detect changes in the rate of linear motion (moving in a straight line regardless of the direction).

In aerospace environment vestibular system plays an important role in 'Orientational Percept' which is a sense of one's linear and angular position and motion relative to the plane of the earth's surface. Spatial Disorientation (SD) is a common phenomenon experienced by the Pilot while flying an Aircraft or astronauts in real space mission. The aetiology of spatial disorientation can be due to either input errors, or erroneous perception of correct sensory information by the brain. One of the important neural reflexes in the aerospace field is the Vestibulo-Ocular Reflex which stabilizes images on the retina during head movement.

### **Association of sympathovagal imbalance and cardiovascular risks in health and disease**

**G. K. Pal, MD**

Prof. & Head, Department of Physiology, Program-Director, Advance Center of Yoga, JIPMER. Editor-in-Chief, International Journal of Clinical and Experimental Physiology (IJCEP), Editor (Physiology), IJPP. E-mail : drgkpal@gmail.com

Any factor that increases susceptibility of the individual to cardiovascular disease (CVD) is considered as a cardiovascular (CV) risk. CV risks could be physical, physiological, or psychosocial. There are many known CVD risk factors. Though few of them such as family history, age and gender are unmodifiable, many of them are modifiable. The modifiable CV risks include obesity, smoking, lack of physical activity, prehypertension, hypertension, dyslipidemia, atherogenic risks, insulin resistance, prediabetes, diabetes, retrograde inflammation, unhealthy diet, psychosocial stress and work stress.

CVD, hypertension and diabetes are becoming more prevalent in Indian subcontinent and they account for 52 per cent of deaths and 38 per cent of diseaseburden as per WHO report on South East Asia Region (SEAR). Assessing a person's CV risk has become the accepted way to target preventive management of subjects who are asymptomatic but at high risk of CVD. Physiological parameters of CV risks are assessed by spectral analysis of HRV, continuous BP variability by Finapres and color ECHO-Doppler. The Framingham risk score (FRS) for CVD has evolved as a validated means for predicting CVD risk in asymptomatic patients. Risk is considered low if the FRS is less than 10%, moderate if it is 10% to 19% and high if it is 20% or more. Metabolic syndrome is an important determinant of CV risk. Till date, no systematic study has been conducted from SEAR for assessment and prevention of CVD. Moreover, FRS often underestimates the CV risk in Asians, in younger patients, subjects with low-socioeconomic status and in those with metabolic syndrome. The concern for cost-effectiveness of CVD interventions in developing countries is growing. Presently, there is a bias towards pharmaceutical interventions in CVD control in both developed and developing nations. While the burden of CVD is alarming in countries of SEAR, future research should put greater emphasis on non-clinical interventions to reduce the economic burden of CVD control. In order to overcome this cost-effective burden in India, we propose Yoga therapy as intervention module in prevention of CVD risks.

The basis of yoga in prevention of CVD and reduction in CV risks are derived from the fact that yoga attains holistic improvement of health through body (physical-physiological) – mind (psychological) homeostasis by primarily attaining sympathovagal balance. Irrespective of the etiology, sympathetic overactivity has been recognized as the main pathophysiological mechanism in the genesis of CVD and metabolic syndrome. Sympathovagal imbalance

owing to sympathetic overactivity and vagal withdrawal is reported to be the basis of many clinical disorders including CVD. However, the role played by vagal withdrawal has been under-reported. Improvement of vagal tone is the key to achieve stable homeostasis through sympathovagal balance. Therefore, practice of yoga that aims at improving vagal tone and reducing sympathetic activity appears to be promising in reducing the CV risks.

## **Clinical Aspects of Aging**

### **I. S. Gambhir**

Department of Medicine, Institute of Medical Sciences, Banaras Hindu University, Varanasi - 221005

Physiological aging makes elderly different from adults. As the aging process is not homogeneous and it does not affect different organ systems equally; it makes elderly a highly heterogeneous group. Clinical features in elderly are due to interaction of physiological aging, disuse and disease process. This is further complexed by co-morbidities & socioeconomic factors. A number of symptoms and signs lose their organ system specificity and become nonspecific. Due to physiological changes the symptoms or signs may be more pronounced in vulnerable organ system than the diseased one. Clinical problems may be multifactorial. There are clinical situations particular to elderly produced by multisystem homeostenosis, termed Geriatric Giants like Immobility, Incontinence, Instability and Cognitive impairment. Hence, a reorientation of clinical medicine becomes imperative.

Physiological changes also affect pharmacology. The pharmacokinetic and pharmacodynamic changes with aging results in significant alterations in the behavior of drugs necessitating reassessment of their therapeutic potential. The treatment goals are also dictated by life expectancy, co-morbidities, health status & other socio economic factors. Compliance with therapeutics is another problem area in elderly. The assessment of Geriatric health encompasses the physical, mental as well as social domain.

Prevention of diseases is a highly rewarding area in elderly. Vaccination in elderly reduces morbidity & mortality. Screening for diabetes, hypertension and certain cancers is recommended. Screening for vulnerability in aged population is an area of interest for interventions to reduce incidence of diseases. Nutritional requirement are changed; elderly consume less calories but need balanced diet rich in micronutrients, Calcium, Protein with low salt & low fat.

## **Remembering to Remember – Prospective Memory**

**Harsha N. Halahalli<sup>1,2,3,5</sup>, John P. John<sup>1,2,4</sup>, Ammu Lukose<sup>1,2</sup>, Sanjeev Jain<sup>2</sup>, Bindu M. Kutty<sup>3</sup>**

<sup>1</sup>Multimodal Brain Image Analysis Laboratory (MBIAL); Departments of <sup>2</sup>Psychiatry, <sup>3</sup>Neurophysiology and <sup>4</sup>Clinical Neuroscience, NIMHANS, Bangalore, India – 560029

<sup>5</sup>*Current affiliation:* Department of Physiology, K.S. Hegde Medical Academy, Nitte University, Mangalore, Karnataka, India – 575018. E-mail: hnharsha@gmail.com

Prospective memory (PM), defined as the ability to perform an intended action after a delay requires intention encoding, maintenance, retrieval and execution as well as cue-surveillance / monitoring during the delay period. Based on the nature of the retrieval cue, PM is classified as event-, time- and activity-based. In most neuroimaging studies of PM, intention retrieval is provoked by some kind of external event. In everyday life however, PM retrieval cues are often endogenous, i.e., linked to an imagined retrieval context. We examined the hemodynamic correlates of a novel PM paradigm wherein the endogenous cue is generated by incremental updating of working memory (WM) to determine if the same brain regions reported in previous studies of exogenous cues are also involved when endogenous cues are used. This fMRI study with eighteen healthy adult volunteers revealed maximum activations in the right rPFC and additionally in the bilateral fronto-parietal regions, left anterior insula (AI) and

anterior/mid-cingulate cortex (ACC). Activation of the AI and ACC which are part of the salience network was found to be unique to this 'endogenous-cue PM task' in comparison to 'exogenous-cue PM tasks' reported in earlier studies. These regions may be linked to the increased demands made by endogenous (vs. exogenous) cues for maintenance of "inner thought" through incremental updating of WM.

## **Aging and Health in India: Current situation and Research Agenda.**

### **Indira Jai Prakash**

Former Professor of Psychology, Bangalore University, Bangalore.

India is the second most populous country next only to China. It is experiencing population ageing with lowering of both crude death and birth rates. The result is a growing number of older people (defined as 60 years and above). There are at present probably around 90 million elderly whose medical, social, economical and psychological needs have to be met adequately.

The current situation of ageing could be summarized as: increase in life expectancy, increasing non communicable diseases, increasing health expenses, feminization of aging and poverty; changes in family and social values, lack of geriatric health services and general lack of planning for an aging population.

In view of the above, several areas of research could be identified as priority areas (specific to Health): Assessing and monitoring the overall disease burden and public health care burden; determinants of ill health in older groups; research into prevention and control of diseases among elderly; socio economic gradient in health and illness; regional variations in burden of diseases, nutritional status, health literacy, lifestyle and public health challenges; access and utilization of health services, especially for vulnerable groups; impact of changes in living conditions and social system on health; Mental health needs of elderly; efficacy of primary healthcare in the context of rural; self-reported disability rates and quality of life; problem of dementia and long term care; special issues such as individuals with developmental and other longstanding disabilities mental retardation, autism, cerebral palsy, seizure disorders, traumatic brain injury as well as physical impairments such as blindness, deafness, and musculoskeletal impairments; various aspects of pharmacology such pharmacokinetic and pharmacodynamic changes tied to aging; medications typically used by older adults, including psychotropic medications, and potential interactions among them. The presentation will briefly touch upon these issues.

## **Pathogenic *SYNGAP1* haploinsufficiency impairs cognitive development by disrupting the maturation of dendritic spine synapses.**

### **James Premdoss Clement Chelliah**

Faculty Fellow, Department of Neuroscience, JNCASR, Jakkur, Bangalore 560 024, Karnataka, India, Email: chelliah@jncasr.ac.in / premclement@gmail.com

Mutations that cause Intellectual Disability (ID) are increasingly found in genes that encode for synaptic proteins. However, it remains unclear how genetic mutations that disrupt synapse function impact intellectual ability. In the *syngap1* haploinsufficiency mouse model of ID, we found that dendritic spine synapses (DSS) develop prematurely during early postnatal development. Premature DSS maturation severely disrupted the balance of excitation and inhibition in the developing hippocampus, which corresponded with the first evidence of behavioural abnormalities. Inducing *SYNGAP1* haploinsufficiency in mature animals had minimal impact on hippocampal DSS function, while repairing pathogenic *syngap1* mutations in adults did not improve basic behavioural and cognitive abnormalities. Further, *syngap1* mutations restricts critical period plasticity during development. These data demonstrate that developing excitatory synapses *in vivo* are exquisitely sensitive to *syngap1* 1 protein levels

and *syngap1* mutations present during development lead to enduring intellectual disability. Thus, we concluded that *syngap1* haploinsufficiency syndrome is characterised by a fundamental disruption to the pace of neural development, and this leads to the failure of cognitive and social maturation during childhood.

## **Molecular basis of ovarian endometriosis**

**Jayasree Sengupta**

Department of Physiology, North DMC Medical College, Hindu Rao Hospital, Delhi 110007

Endometriosis is a complex disorder involving pathogenesis and clinical presentation of ectopically implanted endometrium. The disease etiology is multifactorial and associated with different levels of lesion severity, pelvic pain and subfertility. There is no proven permanent medical treatment option available to the patient. Even after surgical removal of ectopically implanted tissue, the recurrence rate is high. The molecular basis of the pathophysiology of endometriosis is largely unclear. Thus, it becomes a focus for future directions of research in reproductive health care and its management. In the present deliberation, an attempt will be made to elaborate upon the molecular complexities using transcriptomic approach in endometriosis, specifically in ovarian endometriosis - one of three types of endometriosis found in North Indian women during their reproductive life span. Differential expression of specific genes appear as distinguishing features of ectopically implanted endometrium bearing poor cellular integrity compared with its own eutopic counterpart. Endometriotic endometrium displayed anomalous expressional balance for several genes associated with immunological, neuracrine and endocrine functions. While no overt oncogenic potential was observed, CHEK, ERBB family, laminin gamma and Ki-67 genes which are known to be associated with gynecological cancer were also upregulated in endometriotic tissue. Based on gene set enrichment analysis (GSEA) of differential co-expressed genes, a cohort of twenty (28) genes with high degree of predictability index for ovarian endometriosis in the fertile women appears promising.

Research funded by the Department of Biotechnology and the Department of Science and Technology, Government of India.

## **Investigation of cerebral perfusion changes following MDMA “Ecstasy” administration in an animal model using bolus-tracking arterial spin labelling MRI**

**Jennifer Rouine, Institute of Neuroscience, Trinity College, Dublin 2, Ireland**

The recreational drug of abuse 3,4-methylenedioxymethamphetamine (MDMA; Ecstasy) carries a risk of cerebrovascular accidents (CVA) that may relate to the role of neurotransmitters in the regulation of cerebrovascular tone. Advances in magnetic resonance imaging (MRI) have enabled measurement of cerebral blood perfusion using contrast agent-free approaches such as bolus-tracking arterial spin labelling (btASL). This investigation assessed changes in cerebral perfusion following systemic MDMA administration to rats using btASL MRI.

Adult male Wistar rats were administered MDMA (5 or 20 mg/kg; i.p.) or saline, anaesthetised 1, 3 or 24 hours later and a high resolution anatomical scan followed by a continuous ASL (cASL) sequence was conducted using a 7 Tesla MRI scanner. Perfusion-weighted images were generated by subtraction of labelled from control images and experimental data was fitted to a quantitative model of cerebral perfusion to generate mean transit time (MTT), capillary transit time (CTT) and signal amplitude. MTT and CTT are inversely proportional to cerebral blood flow (CBF) and CBF squared respectively, and signal amplitude is proportional to cerebral blood volume (CBV). MDMA induced a reduction in MTT and CTT and an increase in signal amplitude in primary motor, secondary motor and



somatosensory cortex 1 and 3 hours following administration. Such effects were not obtained in sub-cortical regions.

MDMA (20 mg/kg) provoked qualitatively similar effects to the 5-HT releasing drug fenfluramine (10 mg/kg) but not to the 5-HT<sub>2</sub> receptor agonist DOI (1 mg/kg). Depletion of central 5-HT produced a similar effect to that observed with MDMA-induced cortical 5-HT depletion. Pre-treatment with the non selective 5-HT receptor antagonist metergoline (4 mg/kg) or with the 5-HT reuptake inhibitor citalopram (30 mg/kg), however, failed to produce any effect alone or influence the response to MDMA despite blocking MDMA-induced cortical 5-HT loss. As MDMA also provokes the release of dopamine in the brain, the effect of the dopamine D<sub>1</sub> receptor antagonist SCH 23390 (1 mg/kg) was also determined. D<sub>1</sub> receptor antagonism failed to influence the changes in cortical perfusion obtained with MDMA indicating that dopamine D<sub>1</sub> receptors do not play a role in regulating MDMA-related perfusion changes in the frontal cortex. A role for nitric oxide (NO) was implicated where treatment with the neuronal NO synthase inhibitor 7-nitroindazole (7-NI) (25 mg/kg) provoked no change in cerebral perfusion alone yet attenuated the MDMA-related increase in cortical perfusion.

Finally as repeated MDMA exposure leads to long-term 5-HT depletion, long-term changes in CBF and CBV were also assessed 8 weeks following a repeated regime of MDMA (5 and 10 mg/kg; i.p., twice daily for 4 days). Prior exposure to MDMA, having no effect alone, attenuated perfusion changes associated with acute MDMA (20 mg/kg) challenge. In addition, prior MDMA exposure was associated with a long-term reduction in cortical 5-HT concentration.

In conclusion this investigation illustrates the application of btASL MRI for determination of cerebral blood perfusion changes in response to MDMA administration in a rodent model and proposes that btASL MRI is a useful investigational tool with translational potential.

### **Ayurvedic *amalakirasayana* therapy to experimental rats for extended period improves genomic stability in brain cells**

**Kiran Kumar Sindhu<sup>1</sup>, <sup>1</sup>Umakanta Swain and <sup>1,2</sup>Kalluri Subba Rao**

<sup>1</sup>Department of Biotechnology, Jawaharlal Nehru Technological University, Kukkatpally, Hyderabad-500085, India; <sup>2</sup>INSA-Hon.Scientist, School of Medical Sciences, University of Hyderabad, Hyderabad-500046.

This study represents a part of the national program, at the instance of Profs. MS Valiathan and R Chidambaram, to validate, one way or the other, the possible beneficial effects of Ayurvedic rasayana administration at the level of modern acceptable molecular biological parameters. We have carried out a systematic study, with exemplary cooperation from National Institute of Nutrition, Hyderabad to study DNA damage in terms of single strand and double strand breaks (SSB and DSB) in brain cells following amalakirasayana therapy to rats for varying periods ranging from 3 to 9 months. We have also studied the ability of brain cell extracts to affect DNA-gap repair under the above experimental conditions. The results showed, unequivocally, that amalakirasayana therapy resulted in significantly lesser number of both SSB and DSB in neuronal and astrocyte DNA. Further, there was also evidence that the repair of short gaps in DNA are repaired more efficiently in the experimental animals. These results will be discussed.

## Role of Orexin A (hypocretin-1) in modulation of male sexual behavior

**Kamalesh K Gulia**

Sleep Research Laboratory, Comprehensive Center for Sleep Disorders, Sree Chitra Tirunal Institute for Medical Sciences & Technology, Trivandrum 695012 Kerala, India, Email: kkguliak@hotmail.com

Orexin, also called hypocretin, is a neuropeptide involved in regulation of many physiological functions, including the autonomic regulation of body temperature, energy metabolism, arousal, and wakefulness. The orexinergic neurons are localized in the lateral hypothalamus - perifornical area extending the axonal projections throughout the entire brain and spinal cord. The medial preoptic area is an important role in the regulation of male sexual behavior in rats and it receives orexinergic inputs. The orexin-A application at the medial preoptic area increases the sexual arousal as well as the copulatory performance (1). Sexual arousal is one of the physiological stimuli, which influences wakefulness. It is possible that increased wakefulness on application of orexin A at the medial preoptic area/basal forebrain, has a contribution from sexual arousal. The sexual deficits in the narcoleptic patients may be attributed to the degeneration of orexinergic neurons that results in reduction in circulatory levels of orexins (2). The role of the medial preoptic area-septum continuum is important in regulation of various components of sexual functions (3). The role of orexin is discussed in the current context.

## Risk of Particulate Matter Pollutants on Lung Functions: An Indian Perspective

**C. Kesavachandran, Vipin Bihari, Ritul Kamal, Manoj Kumar Pathak, Amarnath Singh, Anup Kumar Srivastava**

Epidemiology Division, CSIR-Indian Institute of Toxicology Research, Lucknow, India

The data collected globally during 2002 - 2010 to track air pollution trend in 189 megacities shows Indian cities among the top rankings, with the highest ambient air pollution in the Earth's surface causing smog. The Environmental Performance Index (EPI) ranking shows India at number 125 out of 132 countries. A widely used health-relevant indicator of the air pollution mixture is particulate matter (PM). The Global Burden of Disease (GBD) study-2010 reported that the air pollutants play a significant role in compounding lung diseases. Risk factors studied in the GBD showed outdoor air pollution at 6<sup>th</sup> position in South Asia (including India, Pakistan, Bangladesh and Sri Lanka) which contribute to 712,000 deaths in 2010. Studies conducted by Central Pollution Control Board, India, at their 400 air monitoring locations showed that only two cities out of 190 Indian cities are within the lower category of pollution level based on oxides of sulfur and nitrogen, and PM<sub>10</sub> in ambient air. Rest of the cities was either in moderate or higher or critical criteria in pollution level classification.

Earlier study showed that for an increase of 10 mg/m<sup>3</sup> in the annual mean of particulate matter lesser than 10 micron size diameter (PM<sub>10</sub>), subjects with an FVC predicted percentage <70% increased from 5% to 8% in a cross-sectional Swiss study on Air Pollution and Lung Disease in adults - SAPALDIA. Earlier cross-sectional studies reported that the air pollution can cause both retardation of lung function growth and acceleration of lung function decline. The assessment of lung function is considered as a significant predictor of respiratory diseases. The Swiss Study on Air Pollution and Lung Disease in Adults (SAPALDIA) shows a 3.14 % decrement in mean FVC for a 10 µg/m<sup>3</sup> increase in ambient PM<sub>10</sub>. In the SAPALDIA study, it was observed that risks from air pollution, even though of small magnitude, can affect lung functions in the populations living there. In our group study, the percentage of decline in FEV<sub>1</sub> with PM<sub>1</sub> and PM<sub>2.5</sub> from the minimum to the maximum concentration was 4.5 - 16.8 % and 2.5 - 13.9 %, respectively. The percentage of decline in PEFR with increasing levels from minimum to maximum of PM<sub>1</sub> and PM<sub>2.5</sub> was 5.8 - 22 % and 4.9 - 26.4 %, respectively.

## Polycystic Ovarian Syndrome and its therapeutic interventions

Laxmipriya Nampoothiri

Department of Biochemistry, Faculty of Science, M.S. University of Baroda (MSU), Vadodara, Gujarat-390002; Email: lnampoothiri@gmail.com Telephone: +91-9925045486

Polycystic Ovarian Syndrome (PCOS) is the most common endocrinopathy of women in reproductive age with a prevalence of 4–25%. Increased androgen synthesis, disrupted folliculogenesis and insulin resistance lie as the core patho-physiology of PCOS. Literature describes PCOS as a disease of altered steroid metabolism. Despite of the immense amount of research, PCOS **etiology is still an enigma and lacks efficient pharmacological treatment. In this context, lab has been working on two aspects- firstly in understanding the patho-physiology of PCOS and secondly to find newer therapeutic interventions using indigenous herbs.** Apart from this, laboratory also focuses on the neuro-endocrine modulations in PCOS condition, as depression and anxiety are important associated co-morbidities. An alteration in various neurotransmitter levels in different brain regions in PCOS condition has been observed. Neurotransmitters directly or indirectly modulate GnRH pulse frequency. Elucidating mechanisms by which GnRH pulse modulation is related to female anxiety-like behaviour may uncover useful approaches for treating women with PCOS who have symptoms of anxiety. The second aspect of our lab is to identify newer herbal therapy for managing PCOS. *Aloe barbadensis Mill.* (Liliaceae), popularly known as *Aloe vera* has been identified for various medicinal properties. Several phyto-sterols present in *Aloe vera* have cholesterol lowering effect and anti-hyperlipidemic properties which are main precursor for the steroid biosynthesis. Studies from laboratory have shown that *Aloe vera* could be a good herbal alternative in management of PCOS. Further, molecular targets are being studied. This will significantly lead to the mechanistic understanding of this disorder and hence provide newer therapeutic interventions for PCOS complications.

### Substance P mediated effects in the mouse central amygdala.

Sosulina L(1,2), Romo-Parra H(1), Strippel C(1), Ilenseer J(1), Kanyshkova T(1), Chauveau F (1), Lesting J(1), Pape H-C(1).

<sup>(1)</sup> Institute of Physiology I, Münster University, Münster, Germany; <sup>(2)</sup> DZNE, Bonn, Germany.

Substance P (SP) and its neurokinin receptor 1 (NKR1) are implicated in stress regulation, affective and anxiety-related behaviour. They have been found within brain areas involved in stress and anxiety responses, with high expression in the main output region of the amygdala complex, the central amygdala (CE). Despite the amount of data concerning SP on the behavioural level, little is known about the cellular mechanisms of this neuropeptide in CE. Here we investigated by electrophysiology, immunostaining and molecular biology techniques i) the cellular mechanisms of SP action in CE *in vitro*, taking advantage of GAD67-GFP mice that yield a reliable labelling of GABAergic neurons which comprise 95% of neuronal population in the lateral section of the central amygdala (CEL); ii) regulation of stress and fear-extinction regulated gene expression of SP and NKR1, using laser capture microdissection and quantitative real-time-PCR. We have found that in GFP-positive neurons within CEL, SP caused a membrane depolarization, increase in input resistance and, increase in hyper excitability seen by the increase in action potential firing frequency. Under voltage-clamp conditions, the SP-evoked membrane current reversed at  $-101.5 \pm 2.8$  mV, and displayed inwardly rectifying pattern indicative of a membrane K<sup>+</sup> conductance. Moreover, SP responses were blocked by the NKR1 antagonist L-822429. Immunofluorescence staining confirmed localization of NKR1 predominantly in GFP-positive neurons. Differences in SP responsiveness were not observed in between the major types of CEL neurons (late firing, regular spiking, low-threshold bursting). Fear conditioning and extinction training selectively increased expression of NKR1 mRNA in the CE and infralimbic cortex (relative to home-cage control mice) without changing expression profile in prelimbic cortex, basolateral and medial

amygdala. In conclusion, SP directly excites GABAergic neurons in CEI through a NKR1-mediated decrease in membrane K<sup>+</sup> conductance that might serve as a mechanism of altered CE activity in stress and learning related behaviour.

## **Insulin and Insulin Resistance: Ringleaders of endothelial dysfunction.**

**Madhulika Dixit**

Department of Biotechnology, IIT Madras, Chennai, INDIA

Epidemiological studies show that initiation of cardio-vascular pathology is a pre-diabetic event and it coincides with appearance of insulin resistance and compensatory hyperinsulinemia. Aberrant endothelial function also referred to as 'endothelial dysfunction' and defective endothelial repair are underlying reasons for these vascular pathologies. Unlike its well-characterized metabolic effects on liver, adipose tissue and skeletal muscles, role of insulin in blood vessels is controversial and currently ill-defined. We hypothesized that sustained exposure to insulin triggers an inflammatory response in endothelial cells even in absence of known pro-inflammatory cytokines. Chronic exposure of primary cultures of human umbilical vein derived endothelial cells (HUVECs), significantly enhanced adherence of leukocytes due to increase expression of cell adhesion molecules ICAM-1, VCAM-1 and PECAM-1 via a pathway involving up-regulation of protein tyrosine phosphatase, SHP2. The talk will summarize these findings and likely molecular links leading to the same. Additionally, I will present some of our recent data on how altered glucose metabolism alters the functional behavior of vascular progenitor cells which are necessary for endothelial repair.

## **Cardiorespiratory Responses of Military Load Carriage at Hostile Environment**

**M. S. Pal, T. Chatterjee, D. Bhattacharyya, A. Pramanik, B. Chowdhury, Deepti Majumdar and D. Majumdar.**

Defence Institute of Physiology and Allied Sciences, Lucknow Road, Timarpur, Delhi-110054, e-mail: madhusudanpal@rediffmail.com

Soldiers in the field often required to carry heavy amounts of weight on their body when on missions. The majority of this weight on the body is comprised of ammunition, ration, water, and body armor. Missions can last from a few hours to several hours without opportunities to restock supplies. This leads to soldiers carrying a wide range of weights and weight distributions on their body. The ability to carry heavy loads over long distances for prolonged duration is a core functional competency for military personnel, particularly the infantry soldiers. The great interest of military researchers is to establish how well soldiers can perform their prime functions during and after load carrying. Hence, present study was designed to find out the effect of high altitude and desert environment on cardiorespiratory responses of soldiers during load carriage operations.

Soldiers of Indian Army were volunteered for the study. Load carriage experiments were conducted at two different high altitudes (11500 ft and 14100 ft) and desert environment. Three magnitudes of load such as 10.7 kg, 21.4 kg and 30 kg were applied along with no load conditions at different walking speeds at high altitudes and desert. Cardiorespiratory responses such as oxygen consumption (VO<sub>2</sub>), energy expenditure (EE), heart rate (HR), respiratory frequency (RF) and pulmonary ventilation (VE) were recorded by using breath by breath gas analyzer.

The present study demonstrated that VO<sub>2</sub>, EE, HR, RF and VE were increased with increasing load/speed at all the environment in comparison to no load condition. All the parameters (VO<sub>2</sub>, EE, HR, RF and VE) showed maximum response at higher load/speed combinations.

The observations of the study will be helpful in developing standards of load to be carried in different hostile environment by Indian soldiers to maintain their effective combat readiness.

## **Alcohol Deaddiction- The Pharmacological Interventions**

**M. C. Gupta**

Professor and Head, Pharmacology, Pt. B D Sharma PGIMS, Rohtak (Haryana)

**Introduction:** Alcoholism is a broad term for problems with alcohol, and is generally used to mean compulsive and uncontrolled consumption of alcoholic beverages. It is medically considered a disease, specifically an addictive illness. A study by NIMHANS has shown that the average age of initiation has reduced from 28 years during the 1980s to 20 years in the recent times. The most recent data on alcohol use is available from the National Family Health Survey (NFHS-3, 2007). It showed that about 32% were current users of alcohol and between 4 and 13% were daily users.

**Diagnosis and Screening:** Identifying alcoholism is difficult because of the social stigma associated with the disease that causes people to avoid diagnosis and treatment. Several tools may be used to detect a loss of control of alcohol use. These tools are mostly self-reports in questionnaire form (CAGE questionnaire, the Michigan Alcohol Screening Test (MAST), alcohol Use Disorders Identification Test (AUDIT), DSM diagnosis and CIWA-Ar score etc.

**Management:** It needs skills and patience. Above all it essentially needs patient's willingness. It involves a combination of psychological and social support and appropriate pharmacological interventions. Drugs are first required to have favorable outcomes of alcohol withdrawal syndrome and then to prevent the relapses as deterrent and anti-craving therapies. The overall management involves three stages, 1: Detoxification, 2: active Treatment and 3: aftercare

**Detoxification:** It is an abrupt stopping of alcohol drinking coupled with the substitution of drugs, such as benzodiazepines that have similar effects to prevent alcohol withdrawal. Benzodiazepines like lorazepam remain the gold standard for managing the withdrawal but have their own limitations. Gabaergic therapies with pregabalin and gabapentin have been used with some success. Detoxification does not actually treat alcoholism, and it is necessary to follow-up detoxification with an appropriate treatment program for alcohol dependence or abuse in order to reduce the risk of relapse. There are four important aspects of detoxification, summarized as the four S's, sedation (or substitution), symptomatic relief, supplements and supportive environment

**Active pharmacological treatment:** Pharmacological treatment is given at two stages i.e. to prevent the precipitation of withdrawal syndrome and then a long term treatment to maintain the patient on withdrawal and prevent any relapses. In the United States there are four currently approved medications for alcoholism: disulfiram, two formulations of naltrexone, and acamprosate. Many other drugs like baclofen, benzodiazepines, calcium carbimide, ondansetron, serotonergic agents, etc. have been used with some success.

**After care:** This involves the rehabilitation-relapse prevention phase of treatment. Rehabilitation is appropriate for patients who are no longer suffering from the acute physiological or emotional effects of recent substance abuse. Goals of this phase of treatment are:

1. To prevent a return to active substance abuse
2. To assist the patient in developing control over urges to abuse drugs
3. To assist the patient in regaining or attaining improved personal health and social functioning

Conclusion: Alcohol dependence is a severe and ever increasing problem especially in developing countries like India with the new found riches and modern habits. It can lead to a severe deterioration of physical, mental and social health of the individual. So therapy must be started at an early stage with a skillful use of psychosocial support coupled with drugs to prevent and control withdrawal syndrome and to prevent relapses. Therapy is usually successful only in patients who themselves are motivated to quit.

## Human neonatal gut contractility studies *in vitro*

Maloy B Mandal

**Aims & objectives :** Neonatal gut motility disorder is a major concern for the morbidity and mortality of neonates in the Indian subcontinent. The functional characteristics of neonatal gut differ due to its immaturity. However, there are limited studies available to understand human neonatal gut contractile physiology.

The objective of the present study is to know whether gut segments removed surgically from the neonates suffering from various congenital gut malformations could be used for assessment of contractile functions of human neonate.

**Methods:** The gut contractility *in vitro* was evaluated by recording spontaneous and chemically induced contractions of gut segments obtained from intestinal atresia, anorectal malformations and Hirschsprung's disease. Circular muscle strips were prepared and mounted in an organ bath containing Krebs-Ringer solutions continuously bubbled with 100% O<sub>2</sub>. Isometric contractions were recorded onto a personal computer through a force transducer and A/D converter. Spontaneous contractions and drug (acetylcholine, histamine, atropine, pheniramine, hexamethonium) induced responses were recorded from small intestinal, colonic and rectal segments. The histological examination of the segments with H & E stain was performed to evaluate the pathological change.

**Results:** There was uniformity in the responses recorded from the segments with minimal histopathological changes. Different agonists treatment revealed concentration dependent rise in contractile tension (g/g wet tissue) and histamine appeared to be most potent one. H<sub>1</sub> receptor blocker almost completely abolished the response. On the other hand, muscarinic blocker atropine could block 70-80% of acetylcholine response. The heightened effect of histamine in neonatal gut appeared to be partly mediated through enteric nervous system, as evidenced by the experiments with ganglion blocker hexamethonium.

**Conclusions:** Results showed that the contractile responses of the gut segments with gross histological changes were variable, but those with minimum pathological changes were uniform. Therefore, it is concluded that judiciously selected gut segments removed for congenital malformations can be useful model to understand the contractile physiology of neonatal gut smooth muscle.

Corresponding author : Dr. Maloy B. Mandal , MD, PhD., Professor and Head, Department of Physiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi – 221 005, India. Email: maloy\_mandal@yahoo.com

## Fractionated ionizing radiation skews differentiation of glial /oligodendrocyte progenitor cells and induces cognitive defects

Michael Peluso<sup>5</sup>, MA Suresh Kumar<sup>#</sup>, Pankaj Chaudhary<sup>&</sup>, Jasbeer Dhawan<sup>+</sup>, Anat Biegon<sup>+</sup>, Ellen Kang<sup>#</sup> and Mamta Naidu<sup>S\*</sup>

<sup>#</sup> Department of Pharmacological Sciences, Stony Brook University, NY; <sup>&</sup> Center for Cancer Research and Cell Biology, Queens University Belfast, UK; <sup>+</sup> Department of Psychology, Stony Brook University, NY; <sup>5</sup> GeneSys Research Institute, St. Elizabeth's Medical Center-Tufts University School of Medicine, Boston, MA

NASA's radiation research program emphasizes understanding the mechanisms of radiation-induced DNA damage. As radiation research on the central nervous system (CNS) has predominantly focused on neurons, with few studies addressing the role of glial cells, we have focused our research on identifying the major DNA repair pathways induced by oxidative stress due to high atomic number (Z) and energy (HZE) radiation in glial cells. Ionizing radiation (IR) causes degeneration of myelin, the insulating sheaths of neuronal axons, leading to neurological impairment. Recent data with lower doses of <sup>56</sup>Fe particle radiation not only show dose-dependent decrease in viable neurons (like X-rays), but also reveal an adverse effect on astrocytes and OL progenitor cells (OPC). However, with higher doses, there was an increase in the proportion of OPC-derived astrocytes, suggesting astrocytosis. Thus, astronauts exposed to protons and HZE radiation risk adverse effects during their missions as well as latent health effects. Moreover, patients undergoing fractionated radiotherapy show higher DNA repair activity in their normal cells, in contrast to their tumor cells. Both of these irradiated human cohorts would benefit from an increased understanding of DNA repair. Because base excision DNA repair (BER) is a pathway up-regulated in response to oxidative stress by low-LET radiation, it is essential to determine how high-LET-induced BER affects the repair in OPC. BER is even more important in mitochondria, the predominant sites of oxidative metabolism, where other DNA repair pathways are more limiting or absent. Since our studies show significant induction of the central BER enzyme apurinic endonuclease-1 (APE1) with dose fractionation, we plan to develop APE1 as a radiation biomarker to quantify these changes and predict radiation risks to CNS. Also, we find that X-rays, protons and HZE exposure inhibit glial progenitor cell differentiation *in vitro*, which may be due to higher APE1 induction along with lowering of mitochondrial membrane potential. APE1 inhibited (at 30%) glial progenitor cells, which had lower mitochondrial membrane potential (than control cells) also senesced within 2-4 days after exposure of both single/ fractionated dose of X-rays/ HZE / protons. Our similar *in vivo* studies with 10-12 month rat spinal cords exposed to single/ fractionated doses of X-rays/ HZE/ protons indicate demyelination at 1.5- 3 months and these animals also showed significant defects in cognition as measured by Novel Object Recognition Testing (NORT) 1.5- 9 months post exposure. Our recent study with quantification of neuro-inflammation in the brains of the X-rays and Protons exposed rats (only at spinal cords) reveals significant increase in neuro-inflammation in all regions of the brain. Further studies with NORT at 1.5 months post exposure show that 300 MeV/n <sup>28</sup>Si (0.5Gy) is most detrimental as compared to 600 MeV/n <sup>56</sup>Fe (0.5 Gy) or 250 MeV protons (1Gy). Also several of 300 MeV/n Si/ 250 MeV protons exposed rats have developed tumors of brain/ intestine. At present, studies are underway to determine if the spinal cord microscopic observation can be further confirmed by *in situ* cell markers of OPC differentiation, and also be corroborated with inhibition in differentiation *in vitro* of OPC isolated from rat spinal cords, possibly resulting in astrocytosis, higher immature OL and lower mature OL formation, leading to demyelination over time.

**Acknowledgements:** This work was supported by four year NASA grant (NNX11A089G to M. Naidu). We would like to thank all the NSRL support teams at Biology, Collider Accelerator and Medical departments, BNL. We thank Dr. Louis Pena of Medical department, BNL for his suggestions and data on previous studies done on CG-4 and rat spinal cord. Finally, many thanks are due to Ellie Blakely, Lora Green (posthumous), Betsy Sutherland (posthumous), Edouard Azzam, John Fike, Gregory Nelson, Bernie Rabin and Charles Limmoli for their excellent suggestions and piggyback beam time (Sutherland and Green).

## **Transition from Physiological to Pathological cardiac hypertrophy: a potential target for Pharmacological Research**

**Subir K Maulik**

Department of Pharmacology, All India Institute of Medical Sciences, New Delhi

On behalf of the CV Research team: SD Seth (Cardiology) and Ruma Ray (Pathology)

Cardiac hypertrophy is an essential compensatory response so the heart can maintain its pumping capacity in the face of increased workload. It is characterized by an increase in the size of individual cardiac myocyte. Cardiac hypertrophic response has been traditionally classified as either physiological or pathological. Physiological stimuli such as exercise and pregnancy lead to compensatory hypertrophy, in which there are normal cardiac structure without any fibrosis, preserved or improved cardiac function, and minimal shift in cardiac gene expression pattern. On the other hand, the pathological hypertrophy is induced by constant pressure or volume overload under various disease conditions, like hypertension, myocardial infarction and valvular heart disease. It is associated with switch in the fetal gene program, interstitial fibrosis, cardiac dysfunction and ultimate cardiac failure. As cardiac failure is almost always linked with cardiac hypertrophy, the revelation of signalling pathways involved in these two forms of hypertrophy are of paramount importance for the potential targets of pharmacotherapy. Various animal models and techniques, involving imaging, molecular biology have been developed over last several years to elucidate the exact mechanisms by which the transition from physiology to pathology occurs and to screen various candidate “drugs”.

## **Yoga based Cardiac rehabilitation after coronary artery bypass surgery: one-year results on LVEF, lipid profile, psychological states-a randomized controlled study.**

**Nagarathna R<sup>1\*</sup>, Rao PV<sup>2</sup>, Swarnagowri MV<sup>1</sup>, Patil S<sup>1,2</sup>, Chaku R<sup>1</sup>, Kulkarni R<sup>1</sup>, Bhagavan B<sup>1</sup>, Bhargav H<sup>1</sup>, Nagendra HR<sup>1</sup>.**

<sup>1</sup> Division of Yoga and Life Sciences, Swami Vivekananda Yoga Anusandhana Samsthana University, 19 Eknath Bhavan, Gavipuram Circle, Kempgowda Nagar, Bangalore, Karnataka, India; <sup>2</sup>Department of Cardiology, Narayana Hrudayalaya Institute of Cardiac Sciences, No. 258/A, Bommasandra Industrial Area, Hosur Road, Anekal Taluk, Karnataka, India.

*Objective:* To compare the long term effects of yoga based cardiac rehabilitation program with only physiotherapy based program on risk factors after coronary artery bypass graft (CABG) surgery.

*Methods:* In this single blind prospective randomized parallel two armed active control study, 1026 patients posted for CABG at Narayana Hrudayalaya Institute of Cardiac Sciences, Bengaluru (India) were screened. Of these, 250 male participants (35-65 years) who satisfied the selection criteria and consented, were randomized into two groups. Yoga group practiced integrated yogic relaxation techniques consisting of physical movements, breathing techniques and meditation. Within and between group comparisons were done on data obtained at three points of follow up i.e. 6<sup>th</sup> week (A), 6<sup>th</sup> month (B), and 12<sup>th</sup> month (C) by using Wilcoxon's signed ranks test and Mann Whitney U test respectively.

*Results:* Yoga group had significantly ( $p = 0.001$ , Mann Whitney) better improvement in LVEF than control group in those with low baseline EF ( $< 53\%$ ) after 12months. There was a better reduction in yoga group ( $p=0.038$ , between groups) at one year in those with high baseline BMI ( $\geq 23$ ). Yoga group showed significant ( $p=0.008$ , Wilcoxon's) reduction in blood glucose at one year in those with high baseline FBS  $\geq 110$ mg/dl. There was significantly better improvement in yoga than the control group in HDL ( $p=0.003$ ), LDL ( $p=0.01$ ) and VLDL ( $p=0.03$ ) in those with abnormal baseline values. There was significantly better improvement ( $p=0.02$ , between groups) in positive affect in yoga group. Within Yoga group, there was significant decrease in perceived stress



( $p=0.001$ ), hospital Anxiety( $p=0.001$ ), Depression ( $p=0.001$ ), and Negative affect ( $p=0.03$ ) while in the Control group there was increase ( $p=0.003$ ) only in scores on hospital Anxiety.

*Conclusion:* Addition of yoga based relaxation to conventional post CABG cardiac rehabilitation helps in better management of risk factors in those with abnormal baseline values and may help in preventing recurrence.

Key Words: yoga, post CABG, cardiac rehabilitation, LVEF, risk factors

**\*Corresponding Author:** Dr Nagarathna Raghuram, MBBS, MD, Faculty, Division of Yoga and Life Sciences, Swami Vivekananda Yoga Anusandhana Samsthana University, 19 Eknath Bhavan, Gavipuram Circle, Kempegowda Nagar, Bengaluru, Karnataka, India. Email: rnagarathna@gmail.com; Phone : +91 9845088086

## **REHABILITATION THROUGH YOGA IN LYMPHATIC FILARIASIS**

**Narahari SR and Aggithaya MG**

Institute of Applied Dermatology, Kasaragod, Kerala, Email: srnarahari@sify.com

Lymphedema occurs when lymph vessel function is greatly impaired. The major cause of lymphedema is Lymphatic Filariasis and affects millions in developing countries. We used pranayama and yoga exercises as part of the integrative treatment for 2,239 patients affected by lower extremity lymphedema. We also used Yoga as a major component of integrative treatment protocol in 14 Indian village camps improved quality of life in 425 Lymphatic Filariasis patients. All patients experienced better mobility and reduced disability.

This presentation is on the gait abnormalities observed in lymphedema patients and the locomotor changes following integrative treatment. Yoga postures were performed as explained by traditional yoga practice in two sessions: before ayurvedic oil massage without compression bandages and after the massage with compression bandages. Each yoga posture lasted for 5 minutes and the whole session ended in 45 minutes. Throughout each session, we advised patients to do long, diaphragmatic breathing, concentrating on each breath. The flexion of joints was coordinated with exhalation and extension with inhalation. We educated the patients to do longer expiration than inspiration. 98 patients (133 limbs) attending the sixth month follow up were evaluated. The most common gait abnormality was antalgic gait. Structural and functional abnormalities were observed in hip, knee and ankle joints. We found that yoga as an adjunct to other components in integrative treatment improved the gait problems. Long standing lymphedema caused altered gait and joint deformities. This was mostly due to inactivity causing muscle weakness and oedema within and around them. Both large and small limbs have shown significant volume reduction ( $p<0.01$ ) during follow up after one year. There can be a mixed etiology for gait related problems in lymphedema patients. One of the major reasons for improvement in the gait is the reduction in the limb volume. Presentation also discusses that the lymph drainage achieved in these patients was plausibly because of breathing, movements coordinated with breathing and stimulation of autonomic system. Further studies are recommended to understand the causes of deformities in lymphedema patients and an exact role of yoga.

## **Light Exposure at Night: 24 hours chronomics of Ambulatory blood pressure and its relation with salivary cortisol & urinary 6-sulfatoxymelatonin (aMT6s) in night shift nursing professionals**

**Verma N. S<sup>1</sup>, Anjum. B<sup>1</sup>, Bhardwaj. S<sup>1</sup>, Tiwari. S<sup>2</sup>, Singh. R<sup>3</sup>, Mahdi. A. A<sup>3</sup>**

Departments of Physiology<sup>1</sup>, <sup>3</sup>Surgery (Gen), <sup>2</sup>Biochemistry King George's Medical University-226003 UP INDIA.

**Background:** Exposure of Light at night (LAN) and Sleep loss may be a novel risk factor for circadian disruption of blood pressure/heart rate and various hormones. Light is the most powerful synchronizer but its exposure in

the night time disrupts the circadian rhythm which may impair the synthesis of melatonin. Shift work disrupts the synchronous relationship between the body's internal clock and the environment.

**Aim:** The aim of the present study was to investigate the effect of rotating night shift and light at night on circadian pattern of BP/HR, salivary cortisol and urinary 6-sulfatoxy melatonin level and its reversibility.

**Material & Method:** 62 healthy nursing professionals, aged 20-40 year, performing day and night shift duties (continuous 9 days night shift with alternate day shifts) from 6 years and willing for compliance were randomly selected and recruited from Trauma Center, GM and Associated Hospitals, KGMU, Lucknow, UP, India. The duration and pattern of shift work were same among all the subjects. Subjects with any acute/chronic illness, known patients of diabetes mellitus, other endocrinal disorders, hypertension, coronary artery disease, and chronic renal diseases were excluded from this study. Blood pressure and heart rate were recorded by an Ambulatory blood pressure monitor TM-2430. Salivary cortisol and urinary melatonin were estimated by ELISA Method. Groups were compared by two tailed paired t test. A two tailed ( $\alpha=2$ ),  $p<0.05$  was considered just significant,  $p<0.01$  moderate/very significant,  $p<0.001$  highly significant.

**Results:** Highly Significant difference was found in double amplitude or predictable change of blood pressure between night and day shift ( $p<0.001$ ). Very interesting patterns of systolic blood pressure, diastolic blood pressure and heart rate of acrophase were found during night shift, however during day shift incomplete recovery was found in 6 subjects. Ecphasia (odd timing of circadian pattern of blood pressure not of heart rate) was also found in few subjects. Alteration in hyperbaric index of SBP and DBP was found during night and day shift. During night shift, hyperbaric index of mean systolic blood pressure was found to be increased at 00-03 am (midnight) however in day shift, peak was found at 06-09 am (early morning). During night shift hyperbaric baric index of mean heart rate was peak at 18-21 pm while during day shift peak was at 06-09 am. Evening cortisol level did not show a significant pattern ( $p>0.05$ ). Highly significant difference was found in night cortisol levels ( $p<0.001$ ) due to recovery during day shift. Alteration in mean morning cortisol level was also found however, this pattern was not highly significant. Night melatonin level was found declined as compared to morning level. Altered melatonin levels were found in night and in the morning samples during night shift.

**Conclusion:** The altered pattern of acrophase of blood pressure and heart rate was found when subjects came back in the day shift and this changed pattern did not appear during 9 days night shift which it could be the effect of rotating night shifts and an indication of internal desynchronization and insufficient recovery during day shift. The cortisol level rises at night and melatonin level declines at night and in the morning hours during night shift than that of day shift. This could probably be due to counteracting effect of light exposure on endogenous circadian rhythm, and desynchronization during night shift.

## **YOGA FOR OCCUPATIONAL HEALTH AND REHABILITATION**

**Naveen K. Visweswaraiah**

Joint Director of Research, SVYASA, Bengaluru & Executive Director, FAITHS, Bengaluru, Karnataka, India; e-mail: anvesana@gmail.com

Yoga is an ancient Indian science, which includes body-work; breath-work and mind-work with an aim to induce a state of mind leading to conscious self evolution. In recent years, yoga is explored as a wellness and healing strategy to deal with psycho-somatic diseases. Given the chronicity of the lifestyle diseases, rehabilitation is becoming an essential part of managing chronic diseases thus leading to an emergence of new disciplines viz., medical and psychiatric rehabilitation. Most of these lifestyle diseases occur in productive years with a significant impact from occupational health hazards. Occupational risk factors need a comprehensive preventive and rehabilitation strategy.

Yoga with its' host of techniques offers a promise in dealing with needs of occupational health and rehabilitation. Our researches on yoga for perception and performance have shown the beneficial effect of yoga, which forms the foundation for exploring yoga for different occupational needs. The depth perception, reaction time and mental relaxation seen in young adults after a 10-day yoga intensive, lead to evolving and testing a specific yoga module for air force pilots. Similarly, positive results on hand steadiness, eye-hand coordination and mental relaxation lead to the specific module for watch assemblers and jewelry assemblers. Further, effect of yoga on musculoskeletal system lead to testing a specific module for floor workers in vehicle assembly line in TVS Motors and Toyota Kirloskar Motors. Railway research board asked for a specific yoga module for motormen of long distance trains. This particular job required a module, which induced deep physical rest and mental alertness simultaneously.

Computer professionals suffer from a host of risk factors and symptoms viz., computer vision syndrome, chronic back pain, generalized polyarthrititis, myalgia and mental stress which is often referred to as 'techno-stress'. Practice of 2 months of specific yoga module in a randomized controlled trial showed improvement in visual strain, muscular pain and mental stress. The control group who continued with un-structured and un-monitored leisure worsened in all three class of symptoms. Different set of studies has shown the use of yoga in the management of carpal tunnel syndrome.

Back pain is referred to as a risk factor and as a health hazard of most desk jobs, manual jobs and those jobs that require extensive travel. Several studies have shown yoga as first line of treatment with lasting benefits in dealing with back pain. There are studies exploring the use of yoga in elderly hospital workers; nurses specially psychiatric nurses and dental hygienists.

Occupational therapy is an inherent part of medical [cardiac, neurologic and orthopedic] and post-traumatic rehabilitation. Several studies have shown yoga as an effective occupational rehabilitation strategy in these areas. This paper would present the specific yoga modules for occupational health and the prevailing evidence in support of them.

## **Nanoparticulated Fluroquinolnes- an experience to develop ocular drug Delivery**

**N.R. Biswas**

Department of Pharmacology, All India Institute of Medical Sciences, New Delhi, India

Nanoparticles for the purpose of drug delivery have definite advantages because of their high stability, high carrier capacity and feasibility of incorporation of both hydrophilic & hydrophobic substances. The nanoencapsulated forms of drugs, due to their improved pharmacokinetic properties are expected to show higher efficacies and low MICs against the microorganisms and animal model infections as compared to conventional drugs. Therefore, the present study was aimed to evaluate the efficacy of topical nanoparticulated sparfloxacin and plain sparfloxacin in the experimental model of corneal ulcer. Washed diachema membrane was kept on each cell of diffusion chamber fitted with continuous slow injector. Transmembrane resistance confirmed intact membrane. Speed was maintained at 160 mins / inch. Chamber was maintained at 36°C. Hundred ml (300 ug sparfloxacin equivalent) of drug was loaded in each cell. Samples were collected in a pre-weighed microcentrifuge tube at ½, 1, 2, 4, 6, 7 & 24 hrs. They were reweighed and volume was determined via density calculation. Collected samples were stored at 70 °C till further analysis by HPLC. Eight white albino rabbits weighing 1.5-2 kg body weight were procured from Institute's Animal House after the approval of the Institute's Animal Ethics Committee for the use of corneal ulcer efficacy study. Sterile saline (0.05 ml) containing *Staph. aureus* 5x10<sup>6</sup> CFU per ml was injected in the cornea for the induction of corneal ulcer. Cornea was anaesthetized with 4% xylocaine before performing the intra-stromal delivery of the inoculums. Therapy was initiated after 18 hrs of the inoculation. The rabbits, which were having

at least grade 1 ulcer, were included in the study. Each rabbit received 50 ul of either 0.1% w/v nanoparticulated sparfloracin formulation or plain 0.3% sparfloracin eye drop four times a day. Treatment was given for 4 weeks,. In our in vitro release study of nanoparticulated sparfloracin, it was found that Formulation IV (sparfloracin 8% loaded) was found to be the best which was used for the in vivo kinetic study. While comparing the percentage healing that occurred after two weeks of therapy, (using the ulcer size) nanoparticulated sparfloracin (0.1% sparfloracin) showed 100% healing over the period of 4 weeks treatment, which was found to be statistically significant ( $p < 0.01$ ), when compared to the plain sparfloracin. Nanoparticulated sparfloracin has been shown to possess 15 times low MIC<sub>90</sub> value as compared to plain sparfloracin against *Staph. aureus*. This study showed that nanoparticulated formulation may be having potential use in ocular drug therapy.

## **Indoor air pollution – a significant but neglected Environmental Risk of Respiratory Diseases among women in developing countries**

**Padmavathi.R**

Solid fuels are burnt in inefficient stoves in poorly ventilated spaces in close proximity to household members especially women and children creating an exposure situation that lasts literally an entire lifetime in rural households of developing countries. Incomplete combustion of such fuels results in emissions of thousands of pollutants that include a cocktail of aerosols (called particulates in the air pollution literature) in the respirable range (0.1-10  $\mu\text{m}$  in aerodynamic diameter), gases such as carbon monoxide, small amounts of nitrogen dioxide, and vapours including HCs and aldehydes. The concentrations of pollutants thus released within households are often up to an order of magnitude higher than typical health standards. In India, up to 444,000 premature deaths in children under 5 years, 34,000 cases of chronic respiratory disease in women under 45 years are attributable to exposure to Indoor Air Pollution due to solid fuel use by households. The burden of disease attributable to use of biomass fuels in India is estimated as 5-6 percent of the national burden of disease. There are substantial climatic and socio-cultural differences between the northern and southern regions, including different food habits and the use of solid fuels for heating, which could have an important bearing on household exposures. Hence, generation of region specific health data and information regarding risk factors association with select health outcomes will aid the policy makers to implement appropriate corrective measures

Sri Ramachandra University (Environmental and Health Departments) team led by Dr.Balakrishnan have conducted large- scale exposure assessment exercises for IAP and health assessments (ARI, COPD, TB etc) in the southern states of Tamil Nadu and Andhra Pradesh and currently examining relationships between select adverse pregnancy and early childhood health outcomes and maternal/ child exposure to indoor and outdoor air pollution in a ICMR Rural –Urban cohort study. Epidemiological studies such as what has been accomplished by SRU pave the way for understanding opportunities for intervention design as well as in monitoring and evaluation of intervention effectiveness. Moreover, it is difficult to estimate the effectiveness of an intervention in situations where pre intervention estimates of health parameter is inadequate, which requires a demanding study design and analysis to examine or quantify causal associations.

Biomass will remain the principal cooking fuel for a large majority of rural households for many years to come. Hence, an effective mitigation strategy should employ a variety of options, from improvements in fuels and cooking technologies to housing improvements, such as kitchen configuration and ventilation conditions, to facilitating behavioral changes among women, children, and other household members (e.g., keeping children away from smoke).

Indeed, addressing such public health risks is an essential element for ensuring equity in quality of life among populations, and it is hoped that the information presented in this conference represents a small, incremental step toward achieving that goal.

## **Brain-gut axis dysfunction in inflammatory bowel disease**

**Purnima Sharma, PhD**

Department of Physiology, All India Institute of Medical Sciences, Jodhpur-342005, Rajasthan

There is a bidirectional interaction between the brain (central nervous system [CNS]) and gut that serves various physiologic functions. Visceral afferent fibers project to the CNS, producing varying interpretations to the stimuli based on prior learning, one's cognitive and emotional state; in turn, CNS can inhibit or facilitate afferent nociceptive signals, motility, secretory functions or inflammation. Numerous data argue for a dysfunction of the brain-gut axis in the pathophysiology of inflammatory bowel disease (IBD). Chronic inflammation and altered motility are hallmark features of IBD as well as of an abnormality of the brain-gut axis. These symptoms are peripheral and/or central in origin and may be the consequence of gut inflammation or an abnormality of pain pathways at the spinal and/or supraspinal level. Stress is involved in the genesis and maintenance of IBD. Disturbances of the autonomic nervous system, with lower parasympathetic functions, are observed in IBD patients. The deeper investigation on this brain-gut axis dysfunction will provide new insight in the cross-talk between the nervous and the gut immune system, thus may lead to the identification of new therapeutic targets to treat intestinal immune diseases.

## **Future of Sports medicine in India. Physiologists of India should shape India athletes' future Olympic medal tally**

**Rajiv Gulati**

Professor, Dept. of physiology. ExMD(physiology); Diploma Anaesthesiology(D.A) India

India is growing in positive directions in sports ignited by Government desire and people awakened in doing sports activities had increase tremendously. Everywhere, exercise facilities are available let be in stadium, in the city or in colonies many exercise centers are developed.. Yoga is our prime basic, Indian product and cheapest product available for our poor community and very effective antioxidant. Health figures in India are not so good, non- communicable diseases are in upward trends At higher levels of competition, it is likely that 'natural selection' tends to eliminate athletes who failed to either inherit or develop characteristics which favor economy and doing things scientifically.

Core stability in prevention of injury of body is important and applies in therapeutic value in cervical, lumber diseases, spinal cord injuries etc. Sports medicine involve Maintenance of Equilibrium - balance, posture, eye movement, Coordination of half-automatic movement of walking and posture maintenance - posture, gait ,Adjustment of Muscle Tone, Motor Learning Motor Skills, Cognitive Function. It involve economic of musculoskeletal, Biomechanics .I will discuss and highlight to you how different sports need various physiological manipulations and how training help in shaping the future of sports person.

Physiologists are good experts and can easily do the Evaluation of Indian Athlete in various Disciplines and prepared the norms scientifically .We the physiologists too can do teaching in sports medicine and do good research in many different fields-- Aerobic and Anaerobic capacities and Cardio-pulmonary responses to exercise, we are the best one to know· Physiological effect of Training on various exercises on at High altitude is also being in our hand ,we are the best to handle the topic son· Body composition, strength and cardio-respiratory Efficiency

of Sportsman and Physiological demands of various sports (In different turfs). I will discuss in brief about these system in macro, micro levels.

We can be the best to Carried out the physical fitness tests of different teams preparing for International competitions in various centers. And Various Biomechanics involved in movement and use the video graphic technique for Sports motion analysis, Analysis of Arch of Feet (Footwear technologies), are in per view of our department. Also we can teach clinical importance of Stress changes, Anthropometric, Physiological and Biochemical Evaluation. Interco relation of motor ability and V02 max amongst sportsperson and use many different. Developed Software for Scientific Monitoring of Sportsperson. I will be briefly touching all the important topics to make conclusion that Our postgraduates can become as experts in training Indian athelets. Emergency care of sportsperson in events as medical doctors we can do better management in national and international sports events.

Keywords: Sports medicine Physiology Economy performance training

## **AUTONOMIC AND ANGIOTENSINERGIC MECHANISMS IN MUSCULAR DYSTROPHY**

**Rasna Sabharwal**

Dept. of Internal Medicine, University of Iowa, Iowa City, IA 52242, USA

Sarcoglycan- $\delta$  (Sgcd) is a subunit of dystrophin glycoprotein complex that is involved in maintaining integrity of sarcolemma during muscle contraction. Mutation in Sgcd causes muscular dystrophy characterized by muscle weakness, atrophy and dilated cardiomyopathy in animals and humans. Renin angiotensin system (RAS) is involved in maintaining cardiovascular homeostasis. It comprises of two axes – vasoconstrictor angiotensin II (AngII) acting *via* type 1 receptors (AT<sub>1</sub>R), and vasodilator Ang(1-7) acting *via* Mas receptors. **Aims:** We hypothesized that activation of the RAS contributes to skeletal muscle and autonomic dysfunction in Sgcd deficient (Sgcd<sup>-/-</sup>) mice at a young age; which later contributes to development of left ventricular (LV) dysfunction and increased mortality. **Methods:** We measured LV function (echo); blood pressure (BP), heart rate (HR) locomotor activity, indices of autonomic functions (radiotelemetry); and survival (Kaplan-Meier) in conscious mice. **Results:** We demonstrated that young Sgcd<sup>-/-</sup> mice exhibit increased fibrosis and oxidative stress in skeletal muscle, decreased locomotor activity and severe autonomic dysregulation, but normal LV function. Autonomic function continued to deteriorate in Sgcd<sup>-/-</sup> mice with age and was accompanied by LV dysfunction at older ages. Young Sgcd<sup>-/-</sup> mice exhibit increased AngII/AT<sub>1</sub>R and reduced Ang(1-7)/Mas expression. Subgroups of control and Sgcd<sup>-/-</sup> mice were treated with either AT<sub>1</sub>R blocker losartan or Ang(1-7) chronically for 8-10 wks. Both losartan and Ang(1-7) decreased oxidative stress and fibrosis in skeletal muscle, increased locomotor activity, and prevented autonomic dysfunction in Sgcd<sup>-/-</sup> mice. Interestingly, Ang(1-7) treatment restored balance between AngII/AT<sub>1</sub>R and Ang(1-7)/Mas axes. **Summary:** (1) AngII-induced skeletal muscle and autonomic dysfunction in muscular dystrophy at a young age contributes to age-related LV dysfunction, and premature death. (2) Treatment with Ang(1-7) counteracts deleterious actions of AngII in muscular dystrophy. Thus, correcting early autonomic dysregulation by Ang(1-7) or enhancing its endogenous production may provide a novel therapeutic approach in muscular dystrophy.

**Corresponding Author:** Dr. Rasna Sabharwal, PhD, 607 MRC, Internal Medicine, University of Iowa, Iowa City, IA 52242, USA, Email: rasna-sabharwal@uiowa.edu

## **Using neuroimaging to investigate the modulation of cognition in man: “POT”ential mechanisms underlying Schizophrenia**

**Sagnik Bhattacharyya**

Institute of Psychiatry, KCL, King's Health Partners

Schizophrenia is one of the top ten causes of disability worldwide and its causes are unclear. Accumulating epidemiological evidence links regular use of cannabis with an increased risk for the development of schizophrenia. Cannabis is one of the most widely used illicit drugs worldwide and has a number of cognitive and symptomatic effects that are also prominent features of schizophrenia. Hence, acute pharmacological challenge with cannabis may be a useful, reversible and safe way to model in many aspects of the cognitive abnormalities in schizophrenia and understand their neural underpinnings. Here, I will summarise the results from a series of studies in healthy human volunteers that combine pharmacological challenge with cannabinoids and neuroimaging techniques to examine the neural mechanisms underlying the cognitive effects of cannabinoids. I will also present data that suggest how these effects on cognition may be linked to the effects on behaviour. Finally, I will briefly discuss the translational potential of this work in terms of identifying individuals who have a greater sensitivity to the effects of cannabis and the development of novel non-dopaminergic treatments for the early stages of psychosis.

## **Metaplastic regulation of synaptic co-operation and competition and its implications in physiology and pathology of long- term memory**

**Sajikumar Sreedharan**

Synaptic plasticity and memory lab, Yong Loo Lin school of Medicine, Department of Physiology, National University of Singapore, 117456

It is now widely accepted that late long-term potentiation (late-LTP) and its associative interactions such as synaptic tagging and capture mechanisms (STC) provide a conceptual basis for the establishment of long-term memory. The associative interactions between weak synaptic inputs (from an early protein synthesis independent input) and a strong input (late-protein synthesis dependent input) will be successful if there is no competition for plasticity related proteins (PRPs), enabling encoding of associative memory without disruption. Although synaptic co-operation and competition are the two sides of the same coin in the memory selection game, the temporal constraints of both these processes are still unclear.

In my talk, I will provide evidence for the temporal persistence of synaptic potentiation which is enabled on one pathway by virtue of the availability of PRPs from another earlier or later event, potentiation of a third pathway around the same time may trigger sufficient competition to prevent persistent potentiation on all pathways. This mimics the daily situation of neurons in the hippocampus, which have to cope with various new learning events. Varying the timing enabled one or more pathways to persist while others do not. Thus, when the number of competing potential memory events increases and the availability of PRPs are limited, a ‘winner-take-all’ scenario appears to prevail whereby some traces persist in a stable manner while others do not. This reminded us to a situation of lateral inhibition in the sensory system; where it is used to increase boundary detection in order to ensure fast information processing with as less ambiguity as possible.

Finally, I will provide a brief understanding about the role of metaplasticity in enhancing co-operation and preventing competition thus enabling the synapses for better memory.

## **Metabolic dysfunction and cognitive decline in aging brain: Strategies to improve cognitive health**

**Sarada Subramanian**

Department of Neurochemistry, National Institute of Mental Health & Neurosciences, Bangalore – 560 029

Cognitive impairment and dementia occur commonly in the elderly population, and increases in incidence within those older than 65 years. Several studies have analyzed risk factors for development of dementia, specifically Alzheimer's disease. Several health related issues such as diabetes, hypertension, and obesity and various lifestyle factors have been studied to determine a link between them and risk for cognitive decline.

Potential mechanisms that may underlie the relationships between metabolic dysfunction and etiology of nervous system degeneration will be reviewed. Some prominent signaling pathways involved in the link between peripheral metabolism and the central nervous system that are potential targets for future therapies and some of the clinical progress in this field will be discussed.

The experimental approaches followed in our laboratory with animal models and ayurvedic plant extracts will be explained. Outcome of our studies suggests that metabolic pathways may themselves contain promising therapeutic targets for improvement of cognitive health.

## **TECHNOLOGICAL SOLUTIONS TO PHYSIOLOGICAL PROBLEMS: DIPAS PERSPECTIVE**

**Shashi Bala Singh**

Indian boundaries are delimited by diverse geographical locations ranging from frozen Himalayan peaks lacking oxygen to hot and dry deserts to hot and humid coastal areas to dense jungles. Indian soldiers are deployed in these varied environmental conditions and are subject to the detrimental effects of these extreme environmental excesses. In addition, the noise and radiation exposure of the troops is a significant occupational hazard. The troops of the Indian Defence Forces are not only expected to survive these extremes but also to perform physically and mentally to discharge their military duties effectively.

DIPAS has been working in the field of military physiology for past fifty years with the primary mandate of promoting human performance in extreme environments. Neurophysiological mechanisms of anorexia, High Altitude Pulmonary Edema, cold injuries, memory impairment, sleep pattern at high altitude have been elucidated for developing preventive/ therapeutic measures. We have undertaken various approaches to devise strategies and products to improve performance of soldiers to combat physiological stresses posed by harsh environments.

- o **Cold, hypoxic environment of High Altitude:** For treating patients of AMS and HAPE and for persons visiting high altitude for shorter duration, a system for improving oxygenation is developed in the form of hyperoxic shelters. Nitric Oxide Delivery System for treatment of HAPE has also been optimized along with formulating Aloe Vera based Alocal cream to treat/ prevent cold injuries. Acclimatization schedule and tenure of posting to aid in the rapid acclimatization of soldiers to high altitude has been prepared. We have also undertaken sleep studies for ameliorating the effects of sleep deprivation and disturbed sleep at the extremes of altitude. Electrically heated gloves and socks are developed for the extremely cold conditions at HA. Sourja, a self sustained solar shelter designed by DIPAS that can generate power in all weather conditions using solar/ wind energy and provides zero energy based habitability under inhospitable environment. Improved Space Heating Devices (Bukhari) have been designed that uses nearly half fuel and does not build CO in the room where it is used, thus making it safe and cost effective. We have tailored Yoga packages for the Armed forces for their performance improvement.



- o **Hot and dry/ humid climate of Deserts/ Coastal regions/ Dense Tropical Jungles:** Hypohydration and the resultant loss of water and electrolytes from the body are the major threats to human physiology in these environments. Soldiers need to acclimatize to the heat in order to survive in these border areas. DIPAS has designed Vortex cooling systems for desert operations to combat heat stress. Tanks provide a heated microclimate for the soldier operating in it, to provide comfort to the tank crew operating in extreme hot conditions, we made a solid state cooling garment for the tank crew.
- o **Occupational stress environment:** Soldiers are constantly exposed to high intensity noise of firing, aircrafts, tanks, etc and it is imperative to reduce the noise induced hearing loss to safeguard them. DIPAS has made Carbogen Breathing System with 5% CO<sub>2</sub> and 95% O<sub>2</sub> that upon inhalation reduces the risk of noise induced hearing loss.

Samudrasuta, an indigenous hyperbaric chamber is developed for research on underwater physiology & medicine, treatment of decompression illness, hyperbaric oxygen therapy for carbon monoxide poisoning, post-operative recovery and treatment of certain type of malignancies.

## **Toxicity Induced by Environmental Toxin, Bisphenol A on Various Vital Organs in Rats**

**Shripad B Deshpande**

Department of Physiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi

Bisphenol A (BPA), an organic compound with two phenol groups, is used in the production of polycarbonate plastics. Reports indicate that more than 90% of the US population has higher urinary levels of BPA. In India, plastic materials are used indiscriminately in packing hot food, tea, milk, etc. It is known that more BPA is leached from the plastics when exposed to heat, altered pH conditions and in lipids. Thus, Indian population is at greater risk than US counterparts. BPA possesses estrogenic property and is reported to cause defective sperm quality and quantity, decreased litter size per breeding pair in animals, decreased fertility, and altered oestrous cycle. BPA also reported to cause neural and behavioural alterations in experimental animals. Although the studies are focussed on reproductive and developmental changes caused by BPA, the effect on cardio-respiratory system and other organs is not known. Here, the effects of BPA on heart, cardio-respiratory systems and other organ systems are reported.

Acute exposure of anesthetized rats to BPA produced cyclical changes in blood pressure and respiration. There was attenuation of J-reflexes elicited by phenylbiguanide (PBG). The PBG response is mediated via afferent vagal fibres and there was attenuation vagal activity evoked by PBG. The *in vitro* studies showed that BPA decreased the rate and force of atrial contractions. The decreased responses were blocked by L-NAME (NO synthase inhibitor) and methylene blue (G-cyclase inhibitor). Thus indicate the involvement of NO-dependent G-cyclase signalling pathways for the BPA actions on atrial. Chronic exposure to plastic leached water produced bradycardia, hypotension and also attenuated the PBG-evoked reflexes. In addition to these cardio-respiratory changes, both BPA and plastic leached water produced changes in the morphological changes in kidney, lungs, heart, liver and uterus. However, the damage caused by plastic leached water was more severe than BPA alone. Thus, our observations indicate that BPA produces toxicity in various organ systems rather than just an endocrine disruptor. Thus human exposure to this compound will have long term health hazards.

## **CHALLENGES FACED BY ASTRONAUTS AND PILOTS**

**B SINHA**

The different illusions arising out of the vestibular system in aerospace environment are: illusions in aviators during flying of aircraft and illusion in astronauts during space travel. Common illusions of spatial disorientation in aviators are classified on the basis of the parts of the vestibular system involved. Some illusions occur from wrong cues from otolith organs like somatogravic and oculogravic illusion, inversion illusion, elevator illusion and G-excess illusion.

**Space Motion Sickness (SMS):** It is a special form of motion sickness that is experienced by some individuals during the first several days of exposure to microgravity. The reasons of SMS include 'Sensory Conflict' and 'Otolith Tilt-Translation Reinterpretation' mechanism.

### **ASSESSMENT OF VESTIBULAR SYSTEM**

The Electronystagmography (ENG), Rotational Chair Testing and Posturography are the commonly used investigating tools to assess functions of vestibular system.

## **Vitamin B12 and the life cycle - Physiological approaches**

**Sucharita S. MD, PhD**

Associate Professor and Head Clinical Physiology Unit, St John's Medical College, Bangalore – 560034; Email: sucharita.dr@gmail.com

Vitamin B12 deficiency prevalence rates in India are highly variable and depend on the population being evaluated. It is particularly important to investigate the occurrence of vitamin B12 deficiency in an Indian population as majority of them practice vegetarianism. There are other additional problems including parasitic infestation and helicobacter pylori infection. Vitamin B12 deficiency is known to cause triad of complications including anaemia, neuropathy and cognitive deficits. Neuropathy may precede other deficits. Vitamin B12 deficiency is most often under-reported in a clinical setup, as it is thought to take many years to develop. The absence of clinical symptoms in subclinical vitamin B12 deficiency does not rule out the possibility of subtle, early functional changes. Vitamin B12 deficiency across the life cycle is increasingly been recognized, especially in two vulnerable populations, older adults and pregnant women. While there are some data that suggest a predictable association between vitamin B12 status and heart rate variability, along a continuum of vitamin B12 values, it is conceivable that the nature of the association between vitamin B12 status and HRV may be different in different age groups. This is plausible because HRV is influenced by age itself and various other factors, which may be operative to different extents at different phases of the life cycle. Understanding the pattern of association between vitamin B12 status and functional changes across life cycle is of relevance as it helps to identify the critical window period during life cycle where interventions could have maximum effects.

## **Stress and early embryo loss: Molecular cues from functional genomics**

**S. Mondal**

National Institute of Animal Nutrition and Physiology, Adugodi, Bangalore - 560 030, E-mail: sukanta781@gmail.com

Early embryonic mortality is one of the major factors of reproductive failure that causes considerable challenge to the mammalian cell biologists. Majority of the losses occurs due to failure of cellular and molecular dialogues at embryo-uterine interface. Understanding and unraveling the secrets of implantation, embryo homing, development and reciprocal signaling networks between the embryo and uterus as well as determining genetic

causes of implantation failure will lead to alleviation of the problems of infertility or development of novel contraception to restrict world population. Climate change, heat stress and nutritional stress are the major intriguing factors responsible for reduced fertility in farm animals in tropical countries. Heat and nutritional stresses affect the reproductive performance by decreasing the expression of estrous behavior; altering ovarian follicular development and hormonal profiles, compromising oocyte competence, and inhibiting embryonic development in livestock including bovines and ovines. Exposure of in vitro heat stress (40.5°C) increased the secretion of prostaglandin  $F_{2\alpha}$  (PGF $_{2\alpha}$ ) from endometrial epithelial cell in ovines. Heat stress has been found to increase the concentrations of PGFM in peripheral circulation and compromised luteal function by diminishing plasma concentrations of progesterone during Days 13 through 19 in gilts. High environmental temperature had a detrimental effect on the quality and developmental competence of oocytes. In vitro heat stress (40.5°C) decreased the quality of the ovine oocytes with the incidence of asymmetric shape, non-differential dispersion of cumulus layer, shrunken ooplasm and degeneration of oocytes and cumulus cells. Heat shock has been found to reduce the proportion of cultured two-cell embryos that developed to the blastocyst stage than heat shock of four- to eight-cell embryos because early embryos are transcriptionally quiescent and unable to produce protective molecules such as heat shock protein 70 (HSP70) in response to heat shock. Identification and characterization of early deviations in gene expression of transcripts would pave the way towards understanding the molecular mechanisms of implantation, embryogenesis and their potential role in early embryo development in response to heat stress.

## **Iron oxide nanoparticles and magnetic field exposure promote functional recovery by attenuating free radical-induced damage in rats with spinal cord transection**

**Suman Jain<sup>1</sup>, Ajay Pal<sup>1</sup>, Anand Singh<sup>2</sup>, Tapas C Nag<sup>3</sup>, Parthaprasad Chattopadhyay<sup>3</sup>, Rashmi Mathur<sup>1</sup>**

Department of Physiology, <sup>1</sup>Department of Biochemistry, <sup>2</sup>Department of Anatomy,  
All India Institute of Medical Sciences, Ansari Nagar, New Delhi-110029

**Background:** Iron oxide nanoparticles (IONPs) can attenuate oxidative stress in a neutral pH environment in vitro. In combination with an external electromagnetic field, they can also facilitate axon regeneration. The present study demonstrates the in vivo potential of IONPs to recover functional deficits in rats with complete spinal cord injury.

**Methods:** The spinal cord was completely transected at the T11 vertebra in male albino Wistar rats. Iron oxide nanoparticle solution (25 µg/mL) embedded in 3% agarose gel was implanted at the site of transection, which was subsequently exposed to an electromagnetic field (50 Hz, 17.96 µT for two hours daily for five weeks).

**Results:** Locomotor and sensorimotor assessment as well as histological analysis demonstrated significant functional recovery and a reduction in lesion volume in rats with IONP implantation and exposure to an electromagnetic field. No collagenous scar was observed and IONPs were localized intracellularly in the immediate vicinity of the lesion. Further, in vitro experiments to explore the cytotoxic effects of IONPs showed no effect on cell survival. However, a significant decrease in H<sub>2</sub>O<sub>2</sub>-mediated oxidative stress was evident in the medium containing IONPs, indicating their free radical scavenging properties.

**Conclusion:** These novel findings indicate a therapeutic role for IONPs in spinal cord injury and other neurodegenerative disorders mediated by reactive oxygen species.

**Keywords:** secondary damage, oxidative stress, electromagnetic field, cytotoxicity, neurodegeneration, pain

## METABOLIC SYNDROME AND NUTRIGENTIC

**Sunita Tiwari** (MD, FAMS)

Prof & Head, Department of Physiology, KG's Medical University, UP, Lucknow – 226003, India

Nutrition plays a vital role in the multidisciplinary management of metabolic diseases. Depending on the pathophysiology and biochemistry of the disease, nutritional therapy can encompass single nutrient manipulations, vitamin supplementation and/or alternative routes of feeding.

The goal of all nutritional therapy is to promote normal growth and development by meeting an individual's nutrient need for energy, protein, fluids, vitamins, and minerals. Nutrition's role in promoting immune function is also well recognized. An optimally functioning immune system is vital for growing children as infection can be life threatening for them. There is a remarkable change in the lifestyle of modern day man having sedentary lifestyle, junk food, less and less of outdoor activity, sitting hours before a television or computer – all these add up to produce obesity.

The prevalence of obesity has been increasing from last decades and obesity has become a major global health problem. It is associated with multiple chronic health conditions including heart disease, hypertension, hyperlipidemia, diabetes, hyperinsulinemia, and cancer. Recommendations for treatment of adults who are overweight or obese focus on energy balance with lifestyle modifications designed to reduce daily energy intake and increase physical activity.

Dietary fat is an important environmental factor, wherein excessive exposure plays a key role in the development of the metabolic syndrome. Diets with reduced levels of carbohydrates and increased protein result in increased weight loss increased loss of body fat and reduced loss of lean body mass. High-fatty diet, particularly high saturated fatty acid (SFA) have been shown to exert detrimental effects on adiposity, inflammation and insulin sensitivity. This promotes the development of insulin resistance, metabolic syndrome and Type 2 DM.

Fat tissue is an endocrine organ which produces and secretes a variety of bioactive substances, referred to as adipokines. It is now recognized that dysregulated production or secretion of adipocytokines leads to the development of obesity-linked complications (Diabetes, hypertension, cardiovascular disease etc). Which manifests as Metabolic Syndrome. Many factors determine serum levels of adipokines such as gender, BMI, as well as diet. A high consumption of foodstuffs such as vegetables, vegetable oils, coffee and tea positively correlated with adiponectin concentration in serum, whilst a negative correlation was seen with consumptions of mixed bread, fried and baked dishes, alcohol, nuts and seeds. The main factor in the appearance of metabolic syndrome is an excess of dietary energy (largely from fats) causing insulin resistance and creating problem of excess energy disposal. Under these conditions, amino acid catabolism is diminished, which indirectly alters the production of nitric oxide and affects blood flow regulation. The oxidation of nitric oxide to nitrite and nitrate affects microbiota composition and functions. Adipose tissue cannot incorporate excessive nutrients after cell enlargement and hence, there is loss of cellular function.

Tissue damage is a form of aggression, and the response is proinflammatory cytokine release. Cytokines favour the massive penetration of immune system cells, such as macrophages which unsuccessfully try to fight an elusive danger for which they are not prepared. The consequence is low-level maintenance of the inflammatory state, which affects endoplasmic reticulum function and the endothelial response to excess regulatory mechanisms affecting blood flow and substrate/oxygen supply. When inflammation becomes chronic, the pathologic consequences are disseminated throughout the body because unused substrates and signals from adipose tissue affect energy partitioning and organ function. In particular high dietary SFA intake ( $\geq 15.5\%$  of energy) accentuated the deleterious effects of some genes on metabolic syndrome risk, suggesting that the long-term effect of dietary

fatty acid composition and consumption may have the potential to modify the genetic susceptibility of developing the metabolic syndrome.

The challenge for current and future research is validation and translation of nutrigenetic findings, which may provide the basis for successful personalised and public health approaches for metabolic disease prevention.

**Key Words:** Obesity, Metabolic syndrome, Nutrigenetic.

## **Anatomy, Physiology, and Biochemistry of Happiness; How sustained happiness can be achieved?**

**SK Singh and Wasim Shaikh**

Department of Physiology, Pramukhswami Medical College, Karamsad 388 325, Gujarat, Email: singhsk@charutarhealth.org

Happiness is a mental or emotional state of well-being characterized by positive or pleasant emotions ranging from contentment or intense joy.

### **The How of Happiness?**

Sonja Lyubomirsky concluded in her book entitled, "The how of happiness" that 50 % a given human's happiness level is genetically determined, 10 % is affected by life circumstances and situations and remaining 40 % of happiness is subject to self-control.

### **Anatomy of Happiness:**

Individual propensity for happiness depends on genetic heritage. Both innate temperament and negative early life experiences are extremely influential in governing happiness. A healthy person returns to previous level of happiness by a homeostatic mechanism that maintains the normal level of happiness (**Happiness set point**).

Our human brain has well developed "**Happiness System**". Positive and negative feelings are generated by different systems in the brain.

Both halves of the brain processes emotions, though the right side tends to be more active when feelings are negative, the left side when they are positive. Happiness and unhappiness have their own brain circuits and their own chemistry. The left hemisphere can encourage positive feelings, presumably by sending inhibiting impulses to the **amygdala**. The amygdala normally gives rise to fear, anger, and disgust. So we seem to have a natural off switch for negative feelings. And with some training we can activate this off switch consciously. The control of negative emotion is one of the secrets of happiness.

Physiology and Biochemistry of Happiness: The root of happiness physiology is in our brains and glands. Happiness produces physiological and biochemical changes. When people are happy, PET and functional MRI shows activity in the left prefrontal cortex. When left prefrontal cortex of brain is stimulated, people feel more positive. Optimism, a contributing factor for happiness is also linked to brain function. The rostral cingulate cortex, part of the frontal cortex and the amygdala, both become active when we imagine positive events.

The neurotransmitter **dopamine** plays an important role in happiness, because it mediates the transfer of positive emotional signals between the left prefrontal cortex and the limbic system of brain. Specifically, dopamine along with **endorphins, oxytocin and serotonin** creates a sense of euphoria and lower the stress hormones cortisol and adrenalin. Happiness is associated with lower level of cortisol and therefore a stronger immune system. Happiness and exercise leads to increase production of antibodies.

**How to achieve sustained Happiness:** Sustained happiness can be achieved by conscious efforts, which are Expressing gratitude, cultivating optimism, Nurturing personal and social relationship, Living in the present moment. Learning to forgive, Taking care of your body and your soul (Yoga and meditation), Joy of giving, Do something you love and Be curious and committing to your goals. We can conclude that happiness can be achieved by conscious efforts and we can train our self for happiness in the same way as we can train our self to any other skill.

“If you want to make others happy practice compassion; and if you want yourself to be happy practice compassion”  
- Dalai Lama

## **Spiritual Interventions in Rehabilitation.**

### **Thimmappa Hegde**

Director and Senior Consultant Neurosurgeon Narayana Hrudayalaya, Karnataka, India; e-mail: thegde@gmail.com

The most difficult aspect of disability is to come to terms with it. To frankly acknowledge that I have a disability. Only then can one pursue methods to deal with it. Only then a person can more comfortably interact with others and get back to more normal life.

Spiritual inputs are the most powerful tools to help a person to come to terms with disability. This paper will discuss various options depending on the state on mind and background of the patient to come to a state of mental well being. The central theme is around the **Serenity Prayer** is the common name for an originally untitled prayer adopted by Alcoholics Anonymous.

God, grant me the serenity to accept the things I cannot change, The courage to change the things can, and wisdom to know the difference.

## **Enhancing, erasing, and tracing long-term memories by targeting PKMzeta**

### **Todd Sacktor**

Professor of Physiology and Pharmacology, Professor of Neurology, M.D. (1982, Albert Einstein College of Medicine), Brooklyn, NY

Most molecular targets for the manipulation of memory focus on the signaling events that initiate memory formation during the brief time window of memory consolidation, or following the reactivation of memory, during reconsolidation. Targets for maintaining the long-term memory trace after consolidation have been unknown. Recently, however, the persistently active atypical PKC isoform, PKMzeta, has been identified as a potential component of the molecular mechanism maintaining the long-term memory trace. Pharmacological or genetic inhibition decreasing PKMzeta activity disrupts both new and established long-term memories, whereas increasing PKMzeta enhances both new and established memories. Localizing increases of PKMzeta within specific circuits of the brain days to weeks after memory consolidation gives the first indication of how the biological trace of long-term memories are stored and can be erased and enhanced.

## Neural Plasticity on an Evolutionary Scale: Redeploying Mate Selection Skills Towards Higher Cognitive Functions

**M K Unnikrishnan**

College of Pharmaceutical Sciences, Manipal University, Manipal 576 104 INDIA

Since the overwhelming majority of unusual features (physical, behavioural, auditory and olfactory) are maladaptive, sexual creatures will almost certainly avoid mates with aberrant attributes. This phenomenon, termed *koinophilia*, could have served as an early evolutionary trigger for cognitive development. However, the cognitive sophistication in humans has been too quick to be attributed to evolutionary adaptation alone. Gould argued that a process of *exaptation* (coopting of previously evolved features for novel purposes) is critical to the unique human cognitive machinery, supporting the reuse of neural circuitry for several cognitive functions. Thus *koinophilia*-driven abhorrence for phenotypic aberrations not only engendered an infatuation for modal features (experienced as attractiveness) but also facilitated detection of subtle variations from the norm; thereby enabling the identification of individuality, a major survival need in large social groups. Unsurprisingly, the face fusiform area (FFA), believed to be dedicated to face recognition, has also been found to play a role in evaluating attractiveness. The extended role of the FFA towards non-innate cognitive skills such as expert pattern recognition (cars, birds, greebles etc.), understanding degraded speech and recognizing board patterns in chess games further support neural reuse. Neural plasticity facilitates the exaptationary expansion of cognitive functions in the context of sensory sophistication spurred by *koinophilic* mate selection. Thus the neural circuits that evaluate mate fitness could have been expanded and redeployed towards a plethora of higher cognitive functions in humans, including a highly evolved aesthetic sensibility and the potential to acquire non-innate cognitive skills.

## Addiction is an epiphenomenon of a brain developmental disorder! Neurobiology of addiction

**Vivek Benegal M.D. (Psychiatry); Diploma in Psychological Medicine (D.P.M.); M.B;B.S.**

Professor of Psychiatry, Centre for Addiction Medicine, Department of Psychiatry, **Email:** vbenegal@gmail.com

The talk focuses on the emerging evidence that addiction to alcohol, tobacco and other drugs as well as to certain behaviors, e.g. gambling, etc. are chronic brain disorders which occur consequent to prolonged neuro-adaptations in key brain pathways which sub-serve motivation, reward, emotional reactance, learning and others. These neuro-adaptations may be more severe and persistent in a subset of humans who are more vulnerable due to pre-existing neurobehavioral traits which are increasingly thought to be a consequence of gene-environment mediated brain developmental delays.

## Neonatal seizures: brain injury, plasticity and a novel treatment approach

**Yogendra H. Raol**

Department of Pediatrics, Division of Neurology, School of Medicine, Translational Epilepsy Research Program, University of Colorado Anschutz Medical Campus, Aurora, CO 80045, USA

Although seizures can occur at any age, they are most commonly observed in neonates. The increased propensity of the immature brain to develop seizures has been found in both humans and animal models, and is attributed to various developmental factors. Clinical as well as basic science research studies suggest that seizures, specifically recurrent and prolonged seizures, may contribute to brain injury and adverse neurological outcome. Unfortunately, the treatments for neonatal seizures remain suboptimal. One of the reasons for the unsatisfactory

efficacy of the current drugs could be that they were originally developed for the treatment of adult seizures and therefore were designed (specifically the newer drugs) to target the mechanisms that causes seizures in the adult brain, and a developing brain may respond very differently to an injury and a treatment. In recent years new drugs such as Bumetanide that modulate age-specific therapeutic mechanisms have emerged, which in preclinical studies have been found to be effective in treating neonatal seizures. Since potassium channels play very important role in controlling excitability in the developing brain due to underdeveloped GABAergic inhibition, we decided to evaluate efficacy of potassium channel openers to treat neonatal seizures. We found that flupirtine was more efficacious than diazepam or phenobarbital, current first-line drugs which modulate GABAergic activity, for the treatment of chemoconvulsant-induced neonatal seizures in rats. Similarly, in a more biological model, flupirtine effectively treated hypoxia-ischemia induced electrographic and behavioral seizures. In the talk I will discuss the reasons for susceptibility of neonatal brain to seizures, briefly review the studies that suggest a direct role of neonatal seizures in long-term adverse neurologic outcome in later-life, describe the inadequacies of current treatments, and provide an overview of emerging strategies to stop neonatal seizures.



## Chitotriosidase-a put ativebiomarker for Sporadic Amyotrophic Lateral Sclerosis

S1

Anu MaryVarghese<sup>1</sup>, AparnaSharma<sup>1</sup>, PoojashreeMishra<sup>1</sup>, Vijayalakshmi K<sup>1</sup>, Harsha HC<sup>2</sup>, Talakad N Sathyaprabha<sup>1</sup>, Srinivas Bharath MM<sup>3</sup>, Nalini A.<sup>4</sup>, Phalguni Anand Alladi<sup>1</sup> and Trichur R Raju<sup>1\*</sup>

Departments of <sup>1</sup> Neurophysiology, <sup>3</sup> Neurochemistry and <sup>4</sup> Neurology, National Institute of Mental Health and Neuro Sciences, Hosur Road, Bangalore - 560 029, India;<sup>2</sup> Institute of Bio-informatics, Discoverer Building, International Tech Park, Whitefield, Bangalore - 560 066, India

**Background:** Potential biomarkers to aid diagnosis and the rapyneed to be identified for Amyotrophic Lateral Sclerosis, aprogressive motor neuronal degenerative disorder. The present study was designed to identify the factor(s)which are uniquely expressed in the cerebrospinal fluid (CSF)of patients with sporadic amyotrophic lateral sclerosis (SALS; ALS-CSF),and could be associated with the pathogenesis of this disease.

**Results:** Quantitative mass spectrometry of ALS-CSF and control-CSF (from orthopaedic surgical patients under going spinal anaesthesia)samples showed up regulation of 31 proteins in the ALS-CSF,amongst which aten-fold increase in the levels of chitotriosidase-1 (CHIT-1)was seen compared to the controls. A seventeen-fold increase in the chitotriosidase-1 levels was detected by ELISA, whileaten- fold elevated enzyme activity was also observed. Both these results confirmed the finding of LC-MS/MS. CHIT-1 was found to be expressed by the Iba-1 immuno positive microglia.

**Conclusion:** Elevated chitotriosidase-1 levels in the ALS-CSF suggest adefinitive role for the enzyme in the disease pathogenesis. Its synthesis and release from microglia into the CSF may be an align edevent of neurode generation. Thus, high levels of chitotriosidase-1 signify enhanced microglial activity which may exacerbate the process of neuro degeneration. In view of the multi fold increase observed in ALS-CSF, it can serve as apotential CSF biomarker for the diagnosis of SALS.

\*Corresponding Author: Dr. T. R. Raju, Senior Professor and Head, Department of Neurophysiology, National Institute of Mental Health and Neuro Sciences Post Box no.: 2900, Hosur Road, Bangalore - 560029,India Telephone: 91-80-26995168, 5173 (Off);Fax: 91-80-26562121; E-Mail: trraju.nimhans@gmail.com

## Association of TNF- $\alpha$ , IL-6 and resistant mRNA expression with insulin resistance and metabolic risk factors in pre-menopausal women.

S2

Kumar Sandeep, Gupta V, Mishra Supriya, Mishra Sameeksha, Gupta Vandana, SrivastavaNidhi, KulshresthaHimani, Natu Shankar Madhav, Chandra Abhijit, Roy Uma, Kumar S

Department of Physiology, Department of Chemical Pathology, Department of Gastroenterology, King George's Medical University Lucknow, Department of Obsteritics and Gynaecology, RIMS, Saifai, UP, Department of Biochemistry, Central Drug Research Institute, Lucknow, AIIMS, Bhopal

**Introduction:** Adipocytokines such as TNF- $\alpha$ , IL-6 and Resistin impart an essential role in lipid metabolism, insulin sensitivity and energy expenditure. Disturbance of these peptides level could lead to metabolic diseases.

**Objective:** The present study was designed to investigate TNF- $\alpha$ , IL-6 and Resistin mRNA expression in adipose tissue and its correlation with metabolic risk factors., insulin resistance in premenopausal women.

**Method:** this is a case control study. A total of 120 premenopausal women were recruited for the study (60 premenopausal with metabolic syndrome and 60 premenopausal without metabolic syndrome). Fasting blood sample were collected at admission and abdominal VAT (visceral adipose tissue) and SAT (subcutaneous adipose tissue) were obtained during open abdominal surgery. Anthropometrical parameters and biochemical parameters

were measured. Serum TNF- $\alpha$ , IL-6 and Resistin level and insulin was estimated by ELISA and IRMA respectively. In VAT and SAT, the TNF- $\alpha$ , IL-6 and Resistin mRNA expression was done real time PCR

**Result:** In VAT as well as in SAT TNF- $\alpha$ , IL-6 and Resistin mRNA expression was significantly higher in premenopausal women with metabolic syndrome as compared to premenopausal women without metabolic syndrome. However the mRNA expression of TNF- $\alpha$  is significantly higher in SAT compared to VAT. Plasma glucose, serum TG and serum cholesterol were found highly significant except serum HDL in premenopausal women with metabolic syndrome. Serum TNF- $\alpha$ , IL-6 and Resistin levels were positively correlated with metabolic syndrome.

**Conclusion:** These results indicate that TNF- $\alpha$ , IL-6 and Resistin mRNA expression in VAT and circulating TNF- $\alpha$ , IL-6 and Resistin level play an important role in development of metabolic syndrome and insulin resistance. TNF- $\alpha$  from SAT might play an important regulatory role on abdominal obesity.

### **Blood clotting and Thrombolytic potential associated with latex proteases from *Plumeriarubra*, *Tabernaemontanadivaricata* and *Artocarpusaltilis***

S3

**Maheshwari Kumari Singh and Bindhu O.S\*,**

**Department of Biochemistry, Center for Post Graduate Studies, 9<sup>th</sup> Main, 18<sup>th</sup> Cross, Jayanagar 3<sup>rd</sup> Block, Jain University, Bangalore.**

**Introduction:** Pharmacological properties by plant latex are due to various biologically active compounds including several proteolytic enzymes. *Plumeriarubra*, *Tabernaemontanadivaricata* and *Artocarpusaltilis* were known for their diverse pharmacological properties. However, their wound healing potential is empirical and lacking in scientific validation which points towards a need for further investigations.

**Objectives:** To study hemostatic potential associated with *P. rubra*, *T. divaricata* and *A. altilis*.

**Materials and methods:** Proteolytic activity of crude enzyme obtained after dialysis of lattices was determined using casein as substrate. Haemostatic potential was evaluated by recalcification time of platelet poor plasma, fibrinogen polymerizing and percentage blood clot lysis assays. The data were analyzed by two tailed paired t-test and p values of <0.05 were considered statistically significant.

**Results:** Higher caseinolytic activity compared to standard proteases, papain and trypsin, was observed with all the three plant extracts. However, the difference was significant ( $p < 0.05$ ) with papain alone. Significant reduction in clotting time was exhibited by *T. divaricata* compared to *A. altilis* and *P. rubra* ( $p < 0.05$ ). These results were further substantiated with fibrinogen agarose plate assay. All three plants showed potent blood clot lysis, former exhibiting the maximum. Inhibition studies confirmed cysteine protease nature of crude enzyme. Comparative analysis revealed *T. divaricata* to be the best among the three for its wound healing potential.

**Keywords:** Latex proteases, procoagulant, blood clot lysis

**Correspondence address:** Dr. Bindhu O S, Assistant Professor, Department of Biochemistry, Centre for Post Graduate Studies, Jain University, Bangalore, Karnataka, India; E mail: bindhupradip@yahoo.co.in

## Spinal motor neuronal excitability in meningocele infants

S4

**Priyanka Bhagat, A.N.Gangopadhyay, S.P. Sharma and UdaiPrakash**

Neurophysiology Research Unit, Department of Physiology and Department of Pediatric Surgery, Institute of Medical Sciences, Banaras Hindu University, Varanasi (India)

**Objective:** To assess the spinal motor neuronal excitability in infants suffering with neural tube defect – meningocele (MMC) using non-invasive H-reflex studies.

**Subject and Method:** 45 Full term AGA babies between the age group from birth to 37 days were subjected to electrophysiological assessment. Out of them, 31 babies were diagnosed as MMC of lumbosacral region, and remaining 14 were normal infants. MMC infants were examined before operation, after operation and during follow up period of 2-6 months. Electrophysiological studies were done with surface electrodes using BSL Advanced System and GRASS Stimulator (model S88). H-reflex latency (HRL), maximum amplitude of H-reflex (Hmax), maximum amplitude of motor response (Mmax), and H/M ratio (proportion of reflexly excitable motor neuron in %) were recorded in both the lower limbs at posterior tibial nerve - soleus muscle in all the infants.

**Result:** The excitability of neurons was measured by increased Hmax, H/M ratio and decrease in reflex latency (HRL). The important electrophysiological finding in preoperative MMC infants was either absence of H-reflex in one or both the limbs, or increased excitability of neurons on the limb side where the reflex was present. H-reflex was not recorded in more than 50% of operated cases of MMC and was absent even during their follow up. Further, in those operated cases where the reflex was elicited, the H/M ratio was significantly less than normal and other parameter (HRL, Hmax, Mmax and HRCV) were comparable with normal infants.

**Conclusion:** Hyperexcitability of spinal neurons, a sign of neural plasticity, was seen in most of the cases of MMC that disappeared in many after surgery. An overall reduction in motor neuronal excitability was noted after surgery and during follow-up study.

**Key words:** Electrophysiology, H-reflex, Infants, Meningocele.

**Corresponding address:** Dr. PriyankaBhagat, Department of Physiology, Institute of Medical Science, Banaras Hindu University, Varanasi- 221005, India. Email: drpriyanka.bhagat4@gmail.com

## Contribution of preoptic area thermo transient receptor potential vanilloid type I (TRPV1) channel in thermoregulation in rats

S5

**Rajesh Yadav, Ashok Kumar Jaryal, Hruda Nanda Mallick**

Department of Physiology, All India Institute of Medical Sciences, New Delhi-110029, India

**Objective:** To study the effect of microinjection of transient receptor potential vanilloid (TRPV1) channel agonist in the preoptic area on brain and body temperature in awake rats

**Method:** The study was conducted in 5 male Wistar rats. Under thiopentone sodium anesthesia (40 mg/kg BW) a bilateral guide cannula (24G) with indwelling styli was implanted with their tips aimed at 2 mm above the preoptic area (POA) as per De Groot's atlas. A radio transmitter TA10TAF-40 (Data Science International, USA) for the telemetric recording of body temperature (Tb) was implanted in the abdomen. A K-type thermocouple wire was inserted near the hypothalamus to measure the brain temperature (Tbr). Tbr was recorded at 15 second interval through a fluke digital thermometer. Tb was recorded telemetrically at 15 second interval. The temperature was measured from 10.00 to 16.00 h and injection was given at 12.00 h. Temperature data was averaged at 15 minute epochs. TRPV1 agonist, capsaicin (0.2µg/0.2µl) injection was given bilaterally at the POA

at a rate of 0.1 micro liter /minute using an injector cannula. The site of injection was confirmed histologically. The statistical comparison was made between pre and post injection record using paired t-test.

**Result:** The body temperature recorded in five rats range between  $37.00 \pm 0.3^{\circ}\text{C}$  to  $37.46 \pm 0.2^{\circ}\text{C}$  and brain temperature  $36.7 \pm 0.3^{\circ}\text{C}$  to  $37.2 \pm 0.4^{\circ}\text{C}$ . The injection of capsaicin ( $0.2\mu\text{g}/0.2\mu\text{l}$ ) into preoptic area produced a prompt fall in body and brain temperature. Tbr significantly decreased from  $37.1 \pm 0.3^{\circ}\text{C}$  to  $36.5 \pm 0.2^{\circ}\text{C}$ , 12:15 to 12:30 h, ( $p < 0.05$ ),  $36.9 \pm 0.2^{\circ}\text{C}$  to  $36.1 \pm 0.5^{\circ}\text{C}$ , 12:45 to 13:0 h, ( $p < 0.05$ ),  $36.9 \pm 0.3^{\circ}\text{C}$  to  $36.2 \pm 0.3^{\circ}\text{C}$ , 13.0 to 13:15 h, ( $p < 0.05$ ) and Tb significantly decreased from  $37.2 \pm 0.2^{\circ}\text{C}$  to  $35.9 \pm 0.6^{\circ}\text{C}$ , 12:30 to 12:45 h, ( $P < 0.05$ ).

**Conclusion:** The TRPV1 channel agonist injection in the preoptic area (POA) brings about fall in body and brain temperature by stimulating warm sensitive neurons.

**Corresponding address:** Rajesh Yadav, Department of Physiology, All India Institute of Medical Sciences, New Delhi-110029, India. Email: drhmallick@yahoo.com

## Effect of single exposure to extremely low-frequency magnetic field on oxidative stress in 6-hydroxydopamine rat model of Parkinson's disease

S6

Shriya Palchaudhuri<sup>1</sup>, Suman Jain<sup>1</sup>, T. Velpandian<sup>2</sup>, Rashmi Mathur<sup>1</sup>

1. Department of Physiology, All India institute of Medical Sciences, New Delhi, India; 2. Department of Ocular Pharmacology and Pharmacy, All India institute of Medical Sciences, New Delhi, India.

Oxidative stress is implicated in the pathogenesis of Parkinson's disease (PD). The present study aims to check the oxidative stress in the initial phase of PD by exposure to extremely low frequency magnetic field (ELF-MF). In unilateral intrastriatal 6-OHDA rat model, we investigated the deficits in motor-coordination; rotarod test, nociceptive behavior; tail-withdrawal latency (TFL) to thermal noxious stimuli at Wk1, 3 and 5, and the temporal pattern of oxidative stress markers at 2h, 6h, 12h and Wk5 in independent studies. Male Wistar rats were divided into control, PD, MF and PD+MF groups. Single 2h exposure to ELF-MF ( $17.96\mu\text{T}$ , 50Hz) was provided to the rat immediately post 6-OHDA-lesion in PD+MF group. Intrastriatal dopamine concentration decreased at 12h post-lesion and progressed till Wk5 which is characteristic of PD. Stay time on rotarod decreased sharply from basal ( $97.3 \pm 10.61$  sec for 25rpm;  $162.83 \pm 23.84$  sec for 10 rpm) to Wk1 ( $2.78 \pm 1.95$  sec;  $25.89 \pm 1.41$  sec, respectively) and then gradually until Wk5. Similarly, TFL to thermal stimuli (5, 10, 40 °C) exhibited an inverse function of the intensity of stimulus. ELF-MF partially improved postural balance to 15 and 20rpm but not to 25rpm and nociceptive withdrawal reflexes to 10 °C but not to 5 °C and 40 °C at Wk1. Oxidative stress markers, 3-nitrotyrosine (3-NT), 3-chlorotyrosine (3CT), 3,4-dihydroxyphenylalanine (DOPA) and tyrosine were estimated at 2h, 6h, 12h, Wk5 post-lesion utilizing liquid chromatography/ tandem mass spectrometry. Concentrations of 3-NT and tyrosine were significantly improved from 2h-Wk5, DOPA from 6h-Wk5 while 3-CT at 2h and 6h. Single 2h exposure to ELF-MF immediately post 6-OHDA injection abolished the increase in oxidative stress markers; led to partial recovery of the symptoms and no statistically significant improvement in dopamine concentration at Wk1-5. Early ELF-MF exposure ( $17.96\mu\text{T}$ , 50Hz) immediately post-lesion for 2h has a beneficial effect in the progression of PD by abolishing the oxidative stress.

## Association between Polycystic Ovarian Syndrome (PCOS) & Diabetes Mellitus in nonalcoholic fatty liver disease subjects – a study conducted in a tertiary care hospital in South Kerala

Simi M & Kalyani Sen

S7

Department of Physiology, SreeGokulam Medical College & Research Foundation, Trivandrum. Affiliated to Kerala University of Health Sciences

**Objectives :** Aim of the study was to determine the prevalence of Polycystic Ovarian Syndrome (PCOS) in Non Alcoholic Fatty Liver Disease (NAFLD) subjects & if there is an association between Polycystic Ovarian Syndrome & Diabetes Mellitus in the same. NAFLD & PCOS are both known to be associated with metabolic syndrome/ insulin resistance

**Materials & methods :** Thirty Four consecutive female patients of reproductive age group, (15-45 yrs) attending the Medical Gastroenterology OutPatient Department of SreeGokulam Medical College Hospital & Research Foundation with abdominal USG consistent with steatosis were screened for PCOS & DM over an 18 month period. Using 2003 Rotterdam Consensus Meeting Criteria, all patients underwent relevant questionnaire, hormonal assays pelvic ultrasound & FBS. The data was analysed using SPSS version 19 and logical conclusions were made.

**Results :** Out of Thirty Four patients included in the study, twelve women with NAFLD matched Rotterdam Consensus meeting criteria for PCOS (35%). A statistically significant association (p value 0.04) was found between PCOS and DM in NAFLD subjects.

**Conclusion :** There is a higher prevalence of PCOS in NAFLD subjects. A significantly higher occurrence of diabetes mellitus was found in NAFLD subjects with PCOS compared to those without PCOS consistent with the proposed common pathophysiological mechanism of insulin resistance.

**Correspondence address:** Simi M, Junior Resident, Dept of Physiology, SGMCRF, Trivandrum. Email: drsimi@live.com

## L-glutamate microinjection in the preoptic area increases brain and body temperature in freely moving rats

S8

Trina Sengupta<sup>a</sup>, Ashok K. Jaryal<sup>a</sup>, Velayudhan M. Kumar<sup>b</sup> and Hruda N. Mallick<sup>a</sup>

<sup>a</sup>Department of Physiology, All India Institute of Medical Sciences, New Delhi and <sup>b</sup>Comprehensive Centre for Sleep Disorders, SreeChitraTirunal Institute for Medical Sciences & Technology, Kerala, India

The role of the preoptic area (POA) in thermoregulation is well documented. Microinjection of various neurotransmitters into the POA in rats has been shown to influence body temperature. Although there are reports showing changes in temperature on administration of L-glutamate into the POA, the role of this excitatory amino acid in thermoregulation has not been studied in unanaesthetized rats. In the present study, brain and body temperatures were recorded in freely moving adult male Wistar rats with K-type thermocouple implanted near the hypothalamus and temperature transmitter implanted inside the peritoneum. Recordings were performed 2 h preinjection and 4 h postinjection. L-glutamate (0.14 nM) microinjection into the POA induced long-lasting hyperthermia and reduced locomotor activity. The rats remained curled up and showed piloerection. L-glutamate-induced hyperthermia was attenuated by previous injection of the ionotropic L-glutamate receptor antagonist, kynurenate (0.11 nM). We propose that L-glutamate in the POA participates not only in heat production and conservation but also plays a role in interlinking sleep and thermoregulation.

## Cardiac output assessment by Transthoracic Electrical Bio-Impedance in patients of acute myocardial infarction: comparison with echocardiography.

S9

Samir Kumar Singh, Manish Bajpai, Sunita Tiwari, Rishi Sethi, Dileep Kumar Verma

Department of Physiology, King George's Medical University, Lucknow U.P., India

**Aims and Objectives-** Transthoracic electrical bio-impedance (TEB) has been proposed as a non-invasive, continuous and cost-effective method of cardiac output (CO) measurement but, it still has not found wide usages in clinics. In this prospective the present study measured CO, using a new instrument – NICOMON (Larsen & Toubro Ltd., India), and compared it with Echocardiography (ECHO) in acute myocardial infarction (AMI) patients.

**Methods-** The present study consists of 100 AMI patients. They have been assessed by ECHO and NICOMON for cardiac output, where ECHO is considered as a reference method for comparison. TEB CO was measured by passing an alternating current and measuring the bio-impedance across the thorax. Ejection fraction (EF) measured by ECHO was used to calculate CO. Various statistical methods like "t"-test & correlation coefficient (r) have been used where found suitable.

**Results-** Mean TEB-CO was  $4.03 \pm 1.11$  l/min and mean ECHO-CO was  $3.80 \pm 1.28$  l/min with a mean difference of  $0.25 \pm 1.02$  l/min. Correlation coefficient (r) was 0.16 and a significant difference ( $P < 0.001$ ) was found for these measurements.

**Conclusions-** It can be concluded that though NICOMON measures CO non-invasively but needs more elaborative studies on a larger sample to establish it as an alternative method of ECHO for measuring cardiac output on regular basis.

**Key words-** Transthoracic electrical bio-impedance, Non-invasive cardiac output.

**Corresponding address:** Dr. Manish Bajpai, Professor, Department of Physiology, King George's Medical University, Lucknow U.P., India. Email: bajpaimanish@yahoo.com

## Effect of short term exercise on Cardiac autonomic function and stress hormone in hypertensive offspring

H1

Abhigna Kulkarni,<sup>1</sup>RavikiranKisan,<sup>\*2</sup> Swapnali,<sup>3</sup>Vidya M Nadiger,<sup>2</sup> D V Deshpande<sup>2</sup>

<sup>1</sup> MBBS Student, SSIMS & RC Davangere, Karnataka; <sup>2</sup> Department of Physiology, SSIMS & RC Davangere, Karnataka; <sup>3</sup> Department of Biochemistry, SSIMS & RC Davangere, Karnataka

**AIMS:** To study the exercise stress response in hypertensive and non hypertensive offspring

**OBJECTIVES:** 1. To compare the blood pressure, heart rate, heart rate variability, cortisol levels in hypertensive and non-hypertensive offspring. 2. To compare the exercise response on the blood pressure, heart rate, heart rate variability, cortisol levels in hypertensive and non-hypertensive offspring

**METHODS:** The study was approved by Institutional Ethical Committee. The study protocol was explained and written informed consent was taken from the volunteers. Detailed personal, medical history was taken. Resting blood pressure, HRV were recorded. Blood sample for cortisol assessment was collected. Then subjects were performed exercise - Queens College step Test (QCT). After performance of QCT, blood pressure, heart rate, HRV were again recorded till the heart rate reached to baseline.

**RESULTS:** The study results showed that increased stress response in hypertensive offspring in terms of elevated heart rate, blood pressure and serum cortisol activity when compared to non hypertensive offspring.

**CONCLUSIONS:** The study shows that the manifestation of hypertension in genetically predisposed persons begins before disease manifestation itself. Therefore people who are at risk for hypertension should start positive health style and disease preventive measures before clinical diagnosis.

**\*Corresponding author: Dr. RavikiranKisan,** Department of Physiology, SSIMS & RC Davangere, Karnataka, Email: drravikiran@rcdavangere.org

## Study of psycho-social impairment in patients presenting with age related macular degeneration in a tertiary eye care hospital.

H2

ChinmayJani, <sup>2</sup>Parul Danayak, <sup>1</sup>Anita Verma and Parth Shah

<sup>1</sup>Department of Physiology, Smt. N.H.L Municipal Medical College, Ellisbridge, Ahmedabad;<sup>2</sup>Department of Ophthalmology, Shri C.H. Nagri Eye hospital, Ellisbridge, Ahmedabad.

**Introduction:** Age Related Macular Degeneration (ARMD) is an eye condition affecting old age people. It is a progressive and irreversible disease causing severe vision loss due to derangement in macula.

**Aim:** This study was carried out to assess the psycho-social impairment in the ARMD patients and compare it with the normal eye patients.

**Method:** Two study groups were made: 1. ARMD patients. 2. Normal eye patients (control group). Patients of both the groups were made to fill "THE VALIDATED GUJARATI VERSION OF: GENERAL HEALTH QUALITY QUESTIONNAIRE -28 (GHQ 28) Self scoring was done according to 0-1-2-3 lower to higher disability respectively.

**Result:** GHQ Mean score of ARMD patients was 34.27 and that of normal eye patients was 24.66. 80.85% of ARMD patients and 26.73% of normal eye patients were psychosocially impaired.

**Conclusion:** ARMD patients are psychosocially more impaired as compared to normal eye patients (p value <0.001, highly significant).

**Key Words:** ARMD (Age Related Macular Degeneration), Psycho-social impairment, GHQ-28 (General Health Questionnaire)

## Ictal EEG non-linear and high order spectral analysis methods in electroconvulsive therapy and its clinical utility

H3

Hulegar A Abhishekh<sup>a</sup>, Acharya U<sup>b</sup>, Jagadisha Thirthalli<sup>c</sup>, Vivek H Phutane<sup>d</sup>, Kesavan Muralidharan<sup>c</sup>, Bangalore N Gangadhar<sup>c</sup>

a. Bangalore Medical College and Research Institute, Bangalore, India; b. Department of Electronics and Computer Engineering, Ngee Ann Polytechnic, Singapore; c. National Institute of Mental Health and Neuro Sciences (NIMHANS), Bangalore, India; d. Royal Melbourne Hospital, Melbourne, Australia

**Introduction:** Electroconvulsive therapy induced ictal EEG analysis early in the course has been shown to predict clinical outcome. Previous studies assessed visual, power spectral and few non linear methods to evaluate EEG signal. EEG signals are non stationary, non linear, non Gaussian and chaotic in nature. Such signals can be better characterized by non linear and higher order spectrum analysis. However there is scarcity of comparative data assessing superiority of such measures in predicting clinical outcome. We conducted analysis of various non linear and high order spectrum analyses of ictal EEG recorded during ECT and correlated it with clinical outcome.

**Methods:** Schizophrenia patients receiving ECT were assessed using the brief psychiatric rating scale (BPRS) before and 2 weeks after the start of ECT. EEG was recorded during seizure. In 26 patients, completely artifact-free EEG of left frontal-pole (FP1) channel and electrocardiography (ECG) were available. Approximate entropy (ApEn), Sample entropy (SamEn), Hurst exponent (H), Bispectrum entropy (HOS.En), correlation dimension (CD) and Largest Lyapunov exponent (LLE) was computed for EEG from the earliest ECT session (2<sup>nd</sup> or 3<sup>rd</sup>) was used for analysis.

**Results:** HOS.En emerged as significant measure which predicted outcome at two weeks (HOS En1:  $r = -0.434$ ;  $p=0.027$  & En2:  $r = -0.414$ ;  $p=0.036$ ). In contrast to expectation ApEn ( $r = -0.001$ ;  $p=0.995$ ), SampEn ( $r = -0.152$ ;  $p=0.458$ ), H ( $r = 0.123$ ;  $p=0.549$ ), CD ( $r = 0.119$ ;  $p = 0.563$ ) and LLE ( $r = -0.293$ ;  $p=0.146$ ) did not show significant result.

**Conclusion:** In patients with schizophrenia receiving ECT higher ictal EEG high order spectral analysis using bispectrum entropy predicts better clinical outcome at the end of two weeks. None of the other non-linear measures evaluated predicted clinical outcome.

**Corresponding address:** Hulegar A Abhishekh, Intern, Bangalore Medical College and Research Institute, Bangalore, India, Email: abhishek.h.a.123@gmail.com

## Correlation of hypertension with its risk factors in adolescent medical students.

H4

Jayneel Shah, Chinmay Jani, Jasmin Parmar

Smt N.H.L Municipal Medical College, Ahmedabad, Gujarat.

**Aim:** This study was undertaken to correlate the hypertension with its risk factors- Dietary habit, Family history and Obesity and find out that which risk factor had maximum incidence of the disease in Adolescents Medical students.

**Method:** Age, diet, family history of hypertension, weight and height were recorded and Body Mass Index (BMI) was calculated from height and weight. BMI was distributed by criteria of W.H.O. Blood pressure was measured



and classified as per the Seventh Report of the Joint National Committee, Geneva. The data was analyzed using chi-square test to find association between hypertension and its risk factors.

**Results:** 79% of Subjects having BMI>25, 77.4% of subjects taking mixed diet & 45.4% subjects having positive family history had either Pre-Hypertension or the Stage-I hypertension.

**Conclusion:** This study shows that increase prevalence of hypertension in adolescents is attributed to various risk-factors like BMI, dietary habit & positive family history. Early modification in these risk factors can be very useful in decreasing the future prevalence of hypertension.

**Key words:**Hypertension; Basal Metabolic Index (BMI); Dietary habit; Family history

## Prevalence of Byssinosis in women working in cotton mills, Davangere, Karnataka

H5

Malay kumar<sup>1</sup>, Suneeta Kalasuramath<sup>2</sup>

Department of Physiology, S S Institute of Medical Sciences & research centre, NH-4, Bypass, Davangere, Karnataka, India.

**Aims & Objectives:** Byssinosis, best known to pulmonologist as "Brown lung disease" is a chronic occupational lung disease. Low socioeconomic women working in cotton mills, often neglect their health and thus this study aimed to find the prevalence of byssinosis, the associated respiratory symptoms, the severity of the disease between the women exposed to cotton dust alone or in combination with other indoor pollutants.

**Methodology:** A cross-sectional study was conducted on apparently healthy women (n= 315) working in cotton mills, Davangere, Karnataka, India. Pre-validated standard questionnaire were used. Byssinosis was graded as per Schilling's scale. Spirometry was done by using computerized, MEDSPIROR.

**Results:** The prevalence of byssinosis was 41%, majority (28%) of women were in grade ½. Significant association was found in the severity of disease between cotton dusts, other biomass users (p<0.05).

**Conclusions:** The prevalence of byssinosis and other respiratory diseases is high. Exposure to cotton dust activates histamine releasing agents, disrupt mucociliary defenses of lungs, and also domestic smoke emissions aggravates the airway reactivity and bronchoconstriction. Therefore, preventive measures like usage of masks, educational interventions to women are of utmost importance in reducing the risk.

**Corresponding address:** Dr Suneeta Kalasuramath, Associate Prof, Department of Physiology, S S Institute of Medical Sciences & Research centre, NH-4, Bypass, Davangere, Karnataka, India, Email: sunivinu50@gmail.com

## Summative evaluation of the MBBS physiology RGUHS question papers: Are the educational objectives met?

H6

Mayank Tandon<sup>1</sup>, Suneeta Kalasuramath<sup>2</sup>

**Aims & Objectives:** Over the years medical education has evolved in the system of education, teaching and evaluation. It is the evaluation system that has the most insightful impact on learning. This study aimed to assess the effectiveness of summative evaluation of undergraduate medical question papers for content validity, level of cognition and the type of domain.

**Methods:** Retrospective analysis of I MBBS undergraduate question papers (n=24) of RGUHS, Bangalore from the year 2006- 2012 was done. Questions were analyzed individually for the type of question, marks allotted for each,

and type of skill analyzed from each question. The data was classified using a modification of Bloom's hierarchy of cognitive learning (level I, II, III).

**Results:** The percentage distribution of marks was not positively related to the number of hours allotted for each chapter. The domain of Affective (level II) was assessed maximally followed by cognition (level I) and least was psychomotor (level III)

**Conclusion:** Examination and evaluation though a source of apprehension for the undergraduate medical students, it is essential to stimulate their cognitive skills by teaching and enhance the evaluation of mental and reasoning skills.

**Correspondence Address:** Suneeta Kalasuramath, Associate Prof, Department of Physiology, S S Institute of Medical Sciences & research centre, NH-4, Bypass, Davangere, Karnataka, India. Email: sunivinu50@gmail.com

### Effect of stress on sleep quality in young adult medical students – a cross sectional study

Ningamma Kadli, Renu Lohitashwa, Ravikiran Kisan, Sindhuja A

Department of Physiology, SSIMS & RC, Davangere, Karnataka

H7

**Aims:** Medical students are a population who are at great risk to develop sleep disruption due to demanding clinical and academic duties. Knowing how much change in sleep wake pattern is associated with subsequent psychological distress could be useful to establish a systematic mental health program in medical schools.

**Objectives:** To evaluate the prevalence and correlation of sleep quality and general health

**Methods:** A cross-sectional study to identify the sleep quality and its correlation to stress among 50 medical students. The instruments employed for data collection were a self report Pittsburg Sleep Quality Index (PSQI) and the General Health Questionnaire (GHQ).

**Result:** Analysis revealed 58% of subjects as poor sleepers. Moreover, there was a significant correlation between sleep quality and general health status of students ( $r = 0.5118$ ,  $p = 0.0001$ ).

**Conclusion:** Sleep disruption due to academic demanding could be a predictor for mental health morbidity in medical students which should be considered in education and mental health policy for this group of students.

**Keywords:** Sleep quality, general health, medical students, psychological distress

**Corresponding address:** Dr. Renu Lohitashwa, Asst Professor, Dept of Physiology, SSIMS & RC, 'Jnanashankara' NH 4 bypass road, Davangere 577005, Karnataka, **Email id:** renukusagar@gmail.com

### Prevalence of Anemia in adults with respect to Socio-Demographic status and Blood groups in North Indian population

Pratishtha Singh<sup>1</sup>, Pratima Verma<sup>1</sup>, Akhilesh Krishna<sup>1\*</sup>, Ashutosh Kumar<sup>2</sup>, Shraddha Singh<sup>1</sup>

<sup>1</sup>Department of Physiology, King George's Medical University UP, Lucknow-226003, India; <sup>2</sup>P.G. Department of Pathology, King George's Medical University UP, Lucknow-226003, India

H8

**Background:** Anemia is a common, multifactorial condition among adults and it is one of India's major public health problems. The World Health Organization (WHO), definition of Anemia, hemoglobin concentration <12 g/dL in women and <13 g/dL in men is most often used in epidemiologic studies of adults. The prevalence of anemia was found to range from 30% to 98% in different studies from different regions.

**Objective:** The present study was designed to assess the prevalence of anemia according to their socio-demographic status and blood group among the apparently healthy young males and females from north Indian regions.

**Materials and Methods:** This is a prospective cross-sectional study, conducted in the Department of Physiology, P.G. Department of Pathology in Kings Georg's Medical University, Lucknow. U.P. Total 609 participants were studied; selected by simple random sampling.

**Results:** The prevalence of anemia in females was 70.1%, which included 48.7% of mild, 19.9% of moderate and 1.5% of severe anemia cases. The prevalence of anemia in Males was 53.2%, with 34.3% suffering from mild, 17.7% from moderate and 1.2% from severe anemia. Both males and females, who belonged to a lower socio-economic status, lower socio-demographical status and a low activity life style, had a higher prevalence of anemia. The prevalence of anemia is higher in blood group O (22.18%) and lower in blood group AB(5.25 %).

**Conclusions:** The present study found a high prevalence of anemia in both males and females in north Indian population. Large population studies are needed to find out the cause and the type of anemia along with other risk factors in all the age groups, irrespective of sex.

## GENDER DIFFERENCE IN HAND GRIP STRENGTH AND ELECTROMYOGRAM (EMG) CHANGES IN UPPER LIMB.

H9

SWETHA RAJKUMAR<sup>1</sup>, MANJUNATH H<sup>2\*</sup> AND VENKATESH D<sup>3</sup>.

<sup>1</sup> II MBBS Student, Navodaya Medical College, Raichur, Karnataka, India.

<sup>2</sup> Assistant professor in Physiology, Navodaya Medical College, Raichur, Karnataka, India.

<sup>3</sup> Professor Head of Physiology, M S Ramaiah Medical College, Bangalore, Karnataka, India.

**Background:** Measurement of hand grip strength is a reliable, useful screening tool in assessing, and managing chronic wrist pain. An electromyogram (EMG) is the record of electrical activity of muscles. When muscles are active, they produce an electrical current proportional to the level of muscle activity.

**Aims and objective:** In this study, an attempt has been made to assess the gender differences in hand grip strength and EMG pattern in upper limb.

**Materials & Methods:** Hand grip strength and EMG were recorded with the help of Grip Force Transducer and surface EMG electrodes. The Maximum Voluntary Contraction (MVC) consisted of a gradual increase in force from zero to maximum over 3 s, with the maximal force maintained for 2–3 s. Mean of three trials of grip strength for right hand was calculated. Subjects performed sustained submaximal contractions of handgrip at two different intensities: 30%, and 75% of MVC. EMG was sampled in 1-s epochs every 15 s during the contractions and the integrated EMG (IEMG) values were normalized to that of the pretrial MVC by taking the ratios of IEMG at submaximal intensities to that of pretrial MVC. The resultant ratios were expressed as percentage.

**Results:** There was a significant difference in hand grip strength with males  $367.97 \pm 80.51$  N having greater values than females  $174.24 \pm 55.36$  N ( $p < 0.05$ ). But women performed submaximal contractions longer than men at each of the two intensities. At 30% MVC, the durations were  $174.51 \pm 82.93$  &  $157.43 \pm 80.31$  s for females and males respectively. The corresponding values at 75% MVC were  $50.79 \pm 24.33$ ,  $38.86 \pm 11.63$  s. The difference was statistically significant. Females had significantly greater IEMG than males,  $51.65 \pm 24.13\%$ ,  $40.00 \pm 16.77\%$  at 30% MVC;  $92.17 \pm 26.44\%$ ,  $71.30 \pm 26.89\%$  at 75% MVC

**Conclusion:** It may be concluded that males have greater hand grip strength but females take longer time to fatigue. Females have higher IEMG during sustained submaximal contractions owing to the differences in blood supply, type of muscle fibers and the central drive.

**Key words:** Hand Grip Strength, Electromyogram.

\*Corresponding author: Dr.Manjunath H, E-mail: aaryanmunch@gmail.com

## Nerve conduction studies of median nerve of healthy male and female in relation to B.M.I. - a report

01

Abhishek Kumar, F. Roohi

Index Medical College Hospital and Research Centre, Indore

**Objective:** To establish nerve conduction velocities of median nerve of both sexes of age gr (20-60) male-80, female =38 in relation to BMI in the malwa region of M.P. India.

**Methods:** Nerve conduction studies were performed prospectively in the upper limb of 118 carefully screened healthy subjects of both sexes between 20 and 60 yrs by using a standardized technique. The nerve conduction studies were performed in separate room without any air conditioning facilities but room temp was between 31-32°C. The machine used was JAVA RMS Aleron 201.

**Result:** The result and conclusion is that the BMI of male (80) was 22.27kg/m<sup>2</sup>. S.D+5.31 and female (38) 20.93kg/m<sup>2</sup> with S.D.3.74 with T value 1.57 and P value 0.119 non significant. So, the mean BMI of male and female is non-significant. The result showed that the BMI of male 22.27 +5.3 and female 20.93+3.74 value is non-significant. The ncv of male is 69.1m/sec+29.8. and female 55.9+32.9 and P Value is 0.038 significant.

**Conclusion:** the NCV is more in male as compared to female although BMI is equally similar in both.

## Assessment of body composition with physical activity and dietary intake in urban and rural post menopausal women

02

A.P.Krishna\*, Rhea Alva#, and Nikhil N# .Shailaja Moodithaya\$

\*Professor, Dept of Physiology, #Interns, \$ Associate Professor, Dept. of Physiology.

K. S. Hegde Medical Academy, Nitte University, Mangalore, Karnataka.

The study was undertaken to compare the nutritional status, body composition and physical activity of post menopausal women from rural and urban population. A total of 60 post menopausal women aged between 40-70 years, 30 from urban and 30 from rural population around Mangalore, Karnataka were recruited. Informed written consent was obtained from all participants, and the experimental protocol was approved by the Ethics Committee of the college. Subjects underwent anthropometric measurements ( body mass index, fat percent and waist hip ratios.),assessment of physical activity level and dietary intakes using validated questionnaires.

Analysis of data showed that urban community had a significantly higher (P=0.000) BMI than the rural community. A significantly higher percent body fat (P=0.023) was observed among urban women compared to that of rural women. As per the analysis of physical activity level, rural subjects have a significantly higher (P=0.000) physical activity level than urban subjects. The total calorie intake per week was significantly higher (P=0.031) in urban subjects than the rural subjects.

The study concludes that the significant differences in BMI, percent fat, physical activity level and calorie intake between urban and rural subjects indicate that urban postmenopausal women associated with increased risk for cardiovascular disease.

## Cardiovascular risk assessment at menopause

03

**<sup>1</sup>Anil Kumar Pandey, <sup>1,2</sup>Jeevandeep Kaur, <sup>1,2</sup>Sunita Siwach, <sup>1</sup>Vijayata sangwan and <sup>3</sup>Asim Das**

1Associate Professor, Physiology, 1,2Assistant Professor, Physiology, 1Assistant Professor, Obstetrics & Gynecology, BPS Govt. Medical College for Women, Khanpur Kalan, Sonapat ; 3Dean ESIC Medical College, Faridabad

**Aims:** The aim of the present study is to obtain valid estimates of the cardiovascular disease risk associated postmenopausal status.

**Objective:** (1) To find out the role of Ankle Brachial Index (ABI), Arterial Stiffness Index (ASI) & Pulse-Wave velocity (PWV) in cardiovascular risk assessment in postmenopausal group. (2) To determine whether assessment of cardiovascular risk may help to improve risk stratification at menopause.

**Materials and Methods:** The study was conducted at BPS Govt. medical College for women, Khanpur Kalan, Sonapat, Haryana in the departments of Gynecology and Physiology. 64 subjects; 34 Post menopausal and 30 healthy controls were enrolled in the study. Pulse wave velocity and parameters of arterial stiffness were assessed by non-invasive PC based Arterial Health Assessment Analysis system (Periscope TM). The total Cholesterol, HDL, TG and LDL were measured in both the groups using standard methods.

**Results:** The heart rate (HR), blood pressure (BP), PP and MAP were significantly higher ( $p < 0.01$ ) amongst postmenopausal women compared to healthy control women. The Carotid Femoral Pulse Wave velocity (C-F PWV), and Arterial Stiffness were significantly higher ( $p < 0.001$ ) amongst postmenopausal women compared to healthy controls women. There was a positive correlation between parameters of arterial stiffness (PWV, ASI) to TC, LDL and TG levels.

**Conclusion:** Our study emphasizes the importance of the PWV and Arterial stiffness in identifying the vascular damage in patients with cardiovascular risk amongst postmenopausal women. Increased PWV and Arterial stiffness were found to be a good independent predictor of cardiovascular morbidity.

**Keywords:** Lipid Profile, Arterial Stiffness, Pulse Wave Velocity, Periscope

**Corresponding address:** Dr Anil Kumar Pandey, Associate Professor Physiology, BPS Govt. Medical College for Women, Khanpur Kalan, Sonapat, EmailID: drpandeyak@yahoo.co.in

## Effect of cold exposure on cardiovascular responses to isometric exercise with advancing age

04

**Anita Herur**

Associate Professor, Department of Physiology, S. Nijalingappa Medical College, Bagalkot, Karnataka, India;

**E-mail:** dranitaherur@yahoo.co.in

**Background:** Mortality due to cardiovascular diseases like myocardial infarction is more common as age advances, and peaks during winter, more so in the early hours of the day. Such cold climatic conditions trigger acute physiological responses such as an increase in blood pressure and vasoconstriction, which become more pronounced with advancing age.

**Aim and Objectives:** To analyze the effect of aging on cardiovascular responses to isometric exercise by comparing the heart rate, blood pressure and rate-pressure product before and after exposure to cold environment in young adults and middle-aged adults.

**Methodology:** This was a randomized control trial which included 20 young adults and 20 middle-aged adults. At room temperature (28°C), blood pressure and heart rate was recorded before and during isometric exercise. Rate-pressure product was calculated. Later, the study subjects were exposed to cold environment (16°C) for one hour. The above parameters were recorded again 30 minutes and 60 minutes after attaining a room temperature of 16°C. Statistical analysis was done by Student's t test.

**Results:** The cardiovascular responses to isometric exercise on cold exposure were blunted with advancing age.

**Conclusion:** Blunted cardiovascular responses on cold exposure with advancing age could play a role in the causation of myocardial infarction.

### Antianxiety effect of ethanolic extract of *Moringa concanensis* leaves in Swiss albino mice

<sup>1</sup>Anu Elizabeth Joy, K Shankar Bhat

05

**Aims and Objectives:** To investigate the anxiolytic activity of *Moringa concanensis* leaves in Swiss albino mice.

**Methods:** The effect of ethanolic extract of *Moringa concanensis* leaves (MCEE) on anxiety in Swiss albino mice was assessed using Elevated plus Maze (EPM). The animals were divided into three groups. Group I: Normal control, Group II: Diazepam (1mg/kg, i.p), Group III: MCEE (200 mg/kg, i.p). All drugs were given for 14 days. On 14th day after 1 hour of the drug administration, the animals were kept on the EPM to assess their effect on anxiety. Mainly two components, the time spent in open arm and in closed arm were noted.

**Results:** The MCEE demonstrated significant ( $p < 0.001$ ) anxiolytic activity in EPM model of anxiety on comparing with the normal control, as evidenced by the increase in time spent in open arm and decrease in time spent in closed arm.

**Conclusions:** The data suggests that the MCEE may have produced its anxiolytic effects via multiple mechanisms.

**Key Words:** Swiss albino mice, Elevated plus maze, Anxiety, MCEE, Antianxiety

**Corresponding Address:** Anu Elizabeth joy, Lecturer, Department of physiology, Yenepoya University, Mangalore. Email: joyliz07@yahoo.co.in

### Assessing student awareness of learning styles and their perceptions to a mixed method approach of learning.

Anumeha Bhagat<sup>1</sup>, Rashmi F Vyas<sup>2</sup>

06

Department of Physiology, Government Medical College and Hospital, Chandigarh; Email Id: dranumeha\_bhagat@yahoo.com; Department of Physiology, Christian Medical College, Vellore.

**Introduction:** Individualization of instructional method does not contribute significantly to learning outcomes even when it is known that students have differing learning styles (LS). Tailoring of instructional method to fit individual LS leads to neglect of the less preferred LS. Awareness of preferred LS to motivate students to incorporate less preferred one, might enhance learning outcomes.

**Aim:** Determine the impact of awareness of LS among medical undergraduates & promote use of mixed methods of learning

**Method:** 50 medical students participated in the study. Students LS preferences and background knowledge of learning styles were assessed. Group discussions in which students mentioned their own strategies for

learning were organized. During discussion they were suggested to use a variety of LS. After three months, VARK preferences were determined again. Feedback evaluation using questionnaire and interviews was also done.

**Result:** There was a highly significant increase in the number of students aware of LS. There was also a highly significant change in the number of participants showing a change in VARK scores for various modalities of learning ( $p < 0.001$ ).

**Conclusion:** Awareness of individual learning styles among MBBS first professional students and emphasizing the use of mixed methods of learning motivates them to adapt other LS.

## Mitochondrial dysfunction in Amyotrophic Lateral Sclerosis

07

**Aparna Sharma, Anu Mary Varghese, Vijayalakshmi K, Srinivas Bharath MM, Phalguni Anand Alladi, Trichur R Raju**

Department of Neurophysiology, National Institute of mental health and neurosciences (NIMHANS), Bengaluru

**Aims & Objectives:** To study the mitochondrial damage in *in-vivo* and *in-vitro* models of sporadic ALS.

**Methods:** Mitochondrial viability and membrane potential were evaluated by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl-tetrazolium (MTT) and JC-1 respectively. Oxidative damage induced by ALS-CSF on spinal cord mitochondria was assessed by Dichlorofluorescein diacetate (DCFDA), hydrogen peroxide and superoxide dismutase levels. Alteration of mitochondrial proteins was assessed by quantitative proteomics. Enzyme activities of respiratory chain complexes were assessed. TUNEL and caspase-3 expression were studied in NSC-34 motor neuron cells.

**Results:** Mitochondrial viability was reduced by 21% and ROS, a marker of oxidative stress was increased by 58% in the CSF-injected group. Hydrogen peroxide levels were increased by 30% and defective membrane potential was observed in the affected mitochondria. Quantitative proteomics of spinal cord mitochondria, revealed up-regulation of 11 proteins and down-regulation of 60. Critically unregulated proteins were Bnip3l, cytochrome-c oxidase subunitII, whereas sialidase, ATPsynthase subunit s-like protein, cytochrome-b5 type B precursor were down-regulated. Higher number of caspase immunoreactive TUNEL positive cells was noted in the affected group.

**Conclusion:** ALS-CSF induces mitochondrial respiratory dysfunction mediated by higher oxidative stress, reduced mitochondrial viability and membrane potential resulting in apoptosis mediated motor neuronal death.

**Corresponding address:** Dr. T. R. Raju, Senior Professor and Head, Department of Neurophysiology, National Institute of Mental Health and Neuro Sciences, Post Box no.: 2900, Hosur Road, Bangalore-560 029, India; E-Mail: trraju.nimhans@gmail.com

## Evaluation of CRRI feedback on need assessment to implement a structured Professional Development program for the Undergraduate Medical Students

08

**Archana P Kumar<sup>1</sup>, Julius Xavier Scott J<sup>2</sup>, Rajendiran S<sup>3</sup>, Vijayaraghavan P V<sup>4</sup>**

1Department of Physiology, 2Dept. of Paediatric Medicines, 3Dept. of Pathology, 4Dept. of Orthopaedics, Sri Ramachandra University, Porur, Chennai

**Introduction:** Undergraduate medical education program should be aimed at creating an 'Indian Medical Graduate' (IMG) possessing adequate knowledge, skills, attitude, values and responsiveness in order to function effectively (GMR, 2012). In order to develop such a Professional Development program it is mandatory to do the need assessment.

**Objective:** To evaluate the CRRIs feedback on need assessment to implement a structured Professional Development program for the Undergraduate Medical Students.

**Materials and Methods:** After getting informed consent a structured and validated questionnaire consisting of 5 open ended and 5 close ended questions was administered to 43 CRRIs (men = 16, women = 27). The data was analyzed using SPSS software version 10.

**Results:** 63% felt that session on 'breaking a bad news' was important, 53% wanted only medical people to deal with all the topics, 40% opted for interactive lectures, 26% for small group discussion 76% felt that the program was meaningful, 90% felt that it was important to run such a program and 87% said that they would recommend this program for their juniors.

**Discussion and Conclusions:** Professional development including ethics and medical humanities is a proposed program by the Medical Council of India. Undertaking the need assessment in every institution before planning the curriculum is crucial to address the specific needs, in addition to the proposed topics. Involving a team of faculty, students and curriculum experts in this process would prove more beneficial.

## Comparison between auditory and visual simple reaction times and its relationship with gender in 1st year MBBS students of Katihar Medical College, Katihar (Bihar)

Arohi Abhinav Jayaswal

Katihar Medical College, Katihar -854105

09

**Objective:** This study was to find out whether the simple reaction time was faster for auditory or visual stimulus. And also whether there is any relationship between Reaction time and gender of an individual.

**Methodology:** 32 subjects were assigned randomly into 2 groups consisting of 16 male students and 16 female students. Both the groups were performed for the visual and auditory tests. The tests were taken from the DirectRT software program from a laptop. The DirectRT software consists of Testlabvisual and Testlabsounds to test the reaction times to visual and auditory stimuli. For each group both the visual and auditory reaction time test were conducted and, the data was taken. The mean reaction time was calculated excluding the first and last values.

**Results:** The results shows that the mean visual reaction time is around  $293.37 \pm 13.01$  milliseconds as compared to the mean auditory reaction time of around  $248.61 \pm 12.84$  milliseconds. The mean visual reaction time is  $285.59 \pm 12.53$  milliseconds in males and  $301.15 \pm 13.49$  milliseconds in females. The mean auditory reaction time is  $246.88 \pm 14.33$  milliseconds in males and  $250.35 \pm 11.36$  milliseconds in females.

**Conclusion:** This shows that the auditory reaction time is faster than the visual reaction time. And also males have faster reaction times when compared to females for both auditory as well as visual stimuli.

**Keywords:** Reaction Time, Auditory Stimuli, Visual Stimuli, Neuromuscular-Physiological Response, Auditory Cortex, Visual Cortex, Muscle Contraction

## Beneficial effect of Yogic lifestyle intervention on lipid profile and HRQL in coronary artery disease patients

Asha Yadav, Savita Singh, KP Singh† and Preeti Pai

Department of Physiology and Medicine† University College of Medical Sciences and GTB Hospital, Dilshad Garden, Delhi-110095

010



**Background & Objectives:** Coronary artery disease (CAD) is a major cause of premature mortality and disability in both developing and developed nations. Dyslipidemia is one of the important modifiable risk factors in CAD which enhances the coagulability of blood. Acute mental stress, anger, fear and excitement may further reduce blood flow through atherosclerotic arterial segments provoking coronary spasm. Yogic lifestyle intervention may not only improve lipid profile but also improve the psychological factors associated with the disease.

**Study Design:** 40 stable CAD patients of both sexes and age group 40-70 years were selected. Lipid profile and Health Related Quality of life (HRQL) were assessed before and after 3 months of yogic lifestyle intervention which consisted of pranayama breathing exercises, yogic postures, dietary modifications and holistic teaching. HRQL was assessed by using Seattle Angina Questionnaire (SAQ). Student's paired T Test was applied to assess lipid profile and each domain of the questionnaire.

**Results:** Serum low density lipoproteins (LDL) and very low density lipoproteins (VLDL) were found to be significantly decreased after 3 months of yogic intervention in CAD patients. Serum cholesterol and triglyceride levels also decreased and high density lipoproteins (HDL) levels increased although not significantly. Significant improvement in all the domains of SAQ (physical limitation, angina stability, anginal frequency, treatment satisfaction & overall quality of life) was found in CAD patients after yogic lifestyle intervention.

**Conclusions:** Yogic lifestyle therapy can be used as an adjunct to pharmacological treatment in CAD patients to achieve optimal results and to improve patient's perception towards disease symptoms and treatment.

**Key words:** CAD, Health Related Quality of life, lipid profile, SAQ, Yogic lifestyle

OII

## Study of H Reflex In Chronic Traumatic Brachial Plexus Injuries

**Ashish Arvind, Sushma Sood, Roop Singh**

**Aims & Objective:** To study the pattern of H reflex and to correlate it clinically in traumatic brachial plexus injury.

**Methods:** Twelve clinically and radiologically confirmed patients of either sex with traumatic injury of >3 months to the brachial plexus were selected. H reflex of Flexor Carpi Radialis muscle on both the limbs was recorded on RMS EMG EP Mark II machine manufactured by Recorders and Medicare Systems, Chandigarh, India in an isolated room with controlled environmental conditions. A series of responses were obtained on both upper limbs starting with submaximal stimuli increasing to supramaximal stimulation by surface recording electrodes taking the normal side as control.

**Result:** H reflex was invariably diminished or absent on the affected side and normal on non-affected side. M latency was significantly low on affected side (p value <0.05) whereas H latency showed non-significant decrease on affected side. H-M latency was also decreased but was statistically non significant. The electrophysiological findings were in unison to clinical findings.

**Conclusion:** The study has so far shown the affirmative result in characterizing the recovery and prognosis of chronic brachial plexus injury but as the number of cases and data obtained is not adequate so, further work is required.

**Corresponding address:** Dr. Ashish Arvind, Room No.-313, Doctor's hostel, Pt. B D Sharma PGIMS, Rohtak-124001, Haryana; Email I.D.- drashisharvind@gmail.com

## Evaluation of anticonvulsant activity of *nigella sativa* in albino rats

012

Asmatanzeem Bepari, Parashivamurthy B.M., Vadhiraaj

Department of Pharmacology, Mysore Medical College and Research Institute, Mysore.

**Objectives:** 1) To evaluate the anticonvulsant activity of Volatile oil of *Nigella sativa* in albino rats and its comparison with sodium valproate; 2) To evaluate the influence of Volatile oil of *Nigella sativa* on the anticonvulsant activity of sodium valproate in albino rats.

**Methods:** Albino rats (150-200gms) of male sex were randomly selected, from central animal facility, Mysore Medical College & Research Institute, Mysore. The anti-convulsant activity was screened using Maximal Electroshock Seizure (MES) model and Pentylentetrazole (PTZ) model. Albino rats were divided into 6 groups of 6 rats each (per model). Control group – Gum acacia 0.5ml, Standard group - Sodium Valproate (300mg/kg), Groups 3, 4, 5 the test drug – Volatile oil of *Nigella sativa* at doses of 200mg, 400mg and 600mg/kg – and group 6 test drug (volatile oil) 200mg/kg with sodium valproate 150mg/kg. All the drugs were dissolved in gum acacia and administered intraperitoneally 30 min prior to induction of seizures.

**Results:** Results were analyzed by ANOVA followed by post hoc Fisher's LSD test. The Volatile oil of *Nigella sativa* has shown anticonvulsant activity at the dose of 400mg/kg and 600mg/kg body weight and the potentiation of anticonvulsant activity of sodium valproate both in Maximal Electro Shock model and Pentylentetrazole induced seizure model. The anticonvulsant activity of Volatile oil of *Nigella sativa* was less when compared to Sodium Valproate in both Maximal Electro Shock model and Pentylentetrazole induced seizure model.

**Conclusions:** The *Nigella sativa* has shown anticonvulsant activity in Maximal Electroshock Seizure (MES) model and Pentylentetrazole induced seizure model of epilepsy. This study has shown that Volatile oil of *Nigella sativa* potentiated the effect of sodium valproate.

**Corresponding address:** Dr. Asmatanzeem Bepari, Postgraduate student in Pharmacology, Mysore Medical College and Research Institute, Mysore. Email id: asmatanzu04@gmail.com

## Evaluation Of Antidepressant Property of Furosemide in Mice

013

Ayesha Rubina

SSIMS & RC, DAVANGERE

**OBJECTIVE:** To evaluate the antidepressant property of Furosemide in mice

**METHOD:** 48 Albino mice of weighing about 25-30gms were taken and divided into 8 groups of 6 mice in each group. 4 groups were used for Forced Swimming Test and 4 groups were used for Tail Suspension Test. Group 1 : Control ; Group 2 : Fluoxetine (5mg/kg) ; Group 3 : Furosemide (100mg/kg) ; Group 4 : Sub Threshold dose [Furosemide (50mg/kg) + Fluoxetine (2.5mg/kg)]

**RESULTS :** Immobility period in both the forced swimming test and tail suspension test was reduced more than the standard drug fluoxetine by furosemide . Significant reduction in immobility period of both forced swimming test and tail suspension test was seen when the subthreshold dose of Furosemide was used along with subthreshold dose of Fluoxetine.

**CONCLUSION :** Furosemide presents significant antidepressant effect in mice. Furosemide given in subthreshold dose potentiates the antidepressant effect of subthreshold doses of Fluoxetine when given in combination, raising the possibility that Furosemide could be used to facilitate the action of other antidepressants, or itself can be used as an antidepressant.

**Correspondence address:** Dr.Ayesha Rubina, PG Pharmacology, SSIMS & RC, DAVANGERE; E-mail : ayesharubina@yahoo.com

## DIP-2 a novel auto-debridement and tissue regenerative remedy for frostbite

014

**B B Sarker, Vandana K.**

Dept. of Biochemical Science (Homeopathic Research Section), Defence Institute of Physiology & Allied Sciences, Lucknow Road, Timarpur, Delhi-110054, Email: drbbsarkar@yahoo.co.in

Frostbite wound healing is medical and surgical problem of global importance. The ischemic/dead, damaged/infected tissues of wound acts as barrier for topical doses up to deeper tissues and delay in healing process DIP-2, a topical herbal product prepared from alcoholic extract of 'Calotropis gigantea' is a potential skin permeation enhancer and contain modulatory constituents like  $\beta$ -sistosterol etc.. Aim of the study was to evaluate the healing potentials of this product through innovative technique of debridement Severe wounds in feet (n=50) were initially cared by immersion in warmed saline for 3-5 hrs for softening the necrotic tissues. Following debridement with the aid of a sterilized artery forceps. Further, the rest softened tissues immersed in DIP -2 solution for 10-15min and dried under the sunlight / fan Repetition of this procedure facilitated auto-removal of remaining dead tissues and enhanced tissue regeneration / repair in cleansed wound sites. This turnover influence to overcome the barrier for easy penetration of topical curative doses, resulting in quick healing. Phytochemical analysis of total phenolics of DIP-2 was carried out. Wound areas (cm) were measured at base line, after treatment and during follow up. Observation of stability of repaired tissues indicates sustained treatment response of regenerative functions of DIP-2. This turnover influence overcoming the barrier for easy penetration of topical curative doses, resulting in quick healing and control of consequential infections, probably due to antibiotic /scavenging property of phenolics and implication of pro-angiogenic factor. Measurement of wound revealed significant progressive tissue saving (80-90%) with cure in maximum cases. The findings attributed to avoid certain surgical intervention, arresting amputation without adverse effects. The product holds promises for evidence based treatment modality, need in-depth investigations for the benefit of frostbite victims.

**Keywords:** Frostbite Wound Healing, Topical Healing, Topical Herbal Product, Innovative Technique, Tissue Regeneration, Phenolics, and Pro-Angiogenic Factor.

## Sensory discrimination in right versus left hand in visually blind and its association to braille reading

015

**Choraghe Rohan P, Pillai Chitra.**

Dept. Of Physiology, TNMC & BYL Nair Ch. Hospital, Mumbai Central-400008; Email ID:-rohanpdc@gmail.com

**Aims:** Association of the score of 2 point discrimination test (2PD) with the learning of written language in braille by blind participants using right or left hand.

**Objective:** To compare average values of 2PD of right and left hand in blind.

**Methods:** 60 blind participants from various colleges in Mumbai were assessed. Detailed history about onset of blindness, motor dominance, preferred braille finger etc. was asked. 2PD test was done in all 10 fingers of hand using weber compass. Unpaired t-test was used for analysis.

**Results:** There was statistically significant difference ( $p < 0.0001$ ) in average values of 2PD in right versus left hand. Most participants (n=44) chose right hand as preferred hand for braille reading; unrelated to motor handedness. Significant difference was found even in values of preferred braille finger in two groups i.e. right index (n=44) versus left index finger (n=16). No relationship of age of onset of blindness or years of blindness with 2PD.

**Conclusion:** Due to presence of language areas in left hemisphere (90-92% of people), all our language related modalities are inclined toward left hemisphere. Here we prove that blind people prefer right hand over left hand while reading written braille language and thus have better sensory discrimination for same. Previous studies have shown that blindness itself acts as stimulus to activate latent pathways (cross-modal plasticity) between somatosensory cortex, visual cortex and language areas. Overall we tried to prove brain is hardwired to do all language related activities preferably with right hand. Further studies in blind with fMRI and braille language tests are needed to confirm hypothesis.

## **Component analysis of Photoplethysmographic signal for assessing vascular responses to Valsalva maneuver**

**Dinu Chandran, Ajoy John Kattoor, Ashok Kumar Jaryal, Kishore Kumar Deepak**

Department of Physiology, All India Institute of Medical Sciences, New Delhi, India

O16

**Aims & Objectives:** The objectives of the present investigation were to study the changes in AC and DC components of PPG signal during Valsalva maneuver (VM) and correlate it with simultaneously recorded arterial blood pressure (BP) and Valsalva expiratory pressures.

**Methods:** PPG signal was acquired in 11 healthy male volunteers from right middle finger using a reflection mode transducer along with beat to beat BP using Finometer while the subject performed VM sequentially at different expiratory pressures of 10, 20, 30 and 40 mm Hg. AC and DC components of PPG were extracted using appropriate digital filters.

**Results:** A proportional and significant rise was obtained in the PPG DC component with increase in Valsalva pressure ( $0.085 \pm 0.063$  Volts (V),  $0.177 \pm 0.112$  V,  $0.264 \pm 0.139$  V and  $0.323 \pm 0.150$  V for VM conducted at 10, 20, 30 and 40 mm Hg pressures respectively;  $p < 0.05$  for all comparisons). Amplitude of the PPG AC component was significantly correlated with the pulse pressure recorded simultaneously during VM in all the subjects (correlation coefficients ranging from 0.64 to 0.91;  $p < 0.001$ ).

**Conclusion:** The AC and DC components of PPG signal correlated to different cardiovascular properties during graded rise in intra-thoracic pressures. It is suggested that, component analysis of PPG signal can be used to monitor the responses in arterial and venous compartments during VM.

Corresponding **address:** Dr. Ashok Kumar Jaryal, Additional Professor, Department of Physiology, All India Institute of Medical Sciences, New Delhi, India, Email: ashok.jaryal@gmail.com, Fax: 91-11-26588663

## ***Withania somnifera* ameliorates alcohol-induced toxicity in rat testis**

**Divya Bhargavan<sup>1</sup>, Harish Shetty<sup>2</sup>, A P Krishna<sup>3</sup>**

1 Dept of Pharmacology, KSHEMA, Mangalore, 2 Department of OBG, KSHEMA, Mangalore, 3 Dept of Physiology, KSHEMA, Mangalore

O17

**Objective:** This study was carried out to investigate the effect of *Withania somnifera* ethanolic root extract [WSEE] on alcohol induced testicular toxicity in rats

**Methods:** Adult Male Wistar rats were categorized into 4 group. One group served as control. Two groups of animals received alcohol orally. One of these groups received ethanolic extract of *Withania somnifera* root extract [WSEE] 4 hours after alcohol administration.

**Results:** The alcohol treated group showed significant decrease in the body, testes and epididymides weights. It also showed alterations in epididymal sperm count, motility and morphology, while the alcohol+WSEE treated group significantly increases these variables compared to the alcohol alone treated group.

**Conclusion:** The findings in the study showed that treatment of *Withania somnifera* root extract ameliorates alcohol induced testicular toxicity in rats.

**Corresponding address:** Divya Bhargavan, Lecturer, Dept. of Pharmacology, K S Hegde Medical academy  
E-mail id : divyabhargavan@rediffmail.com

## Estimation of urinary excretion of type I collagen degradation products in female population of Manipur - a preliminary study

018

**G. Majachunglu, L. Suresh Roy**

Department of Physiology, Regional Institute of Medical Sciences, Imphal, Manipur – 795004

**Introduction:** Bone is a metabolically active tissue which undergoes remodeling process throughout life and various biochemical markers of bone turnover provide clinically useful evidence of the normal and pathological processes that reflect bone activity in the skeleton which reflect the activity of osteoblasts and osteoclasts. The resorption process mediated by the osteoclast cells can be studied by urinary biomarkers out of which the carboxy- and amino-terminal cross-linked telopeptides of type I collagen (CTX-I and NTX-I) seem to be most reliable. An attempt is being made to develop a normative data for the normal female population of Manipur.

**Objective:** To estimate the urinary excretion of type I collagen degradation products (CTX-I and NTX-I) among the normal healthy female population of Manipur.

**Method:** This is a cross-sectional study conducted in the Departments of Physiology and Physical Medicine and Rehabilitation, Regional Institute of Medical Sciences, Imphal among 85 normal female subjects of Manipur during July to September, 2013. The levels of CTX-I and NTX-I in the urine were estimated with the help of ELISA kits.

**Result:** The levels of uCTX-I and uNTX-I were found to be higher among the younger females which may be due to age related changes in bone turnover.

**Conclusion:** These findings indicate that the normal bone resorption process among females and further study may be needed to understand and obtain a normative data among the population of Manipur.

**Keywords:** Bone, Resorption, CTX-I, NTX-I, Healthy female, Elisa.

## Peripheral vasoconstriction varies among peoples during motor imagery central command

019

**Gaurav Jain<sup>1</sup>, Chhaya Kharya<sup>3</sup>, Mithilesh Pal<sup>3</sup>, Ashok K Jaryal<sup>2</sup>, Sneha Anand<sup>3</sup>, Kishore K. Deepak<sup>2</sup>**

1Department of Physiology, Gajara Raja Medical College, Gwalior (M.P.); 2Department of Physiology, All India Institute of Medical Sciences, New Delhi.; 3Department of Biomedical Engineering, All India Institute of Medical Sciences, New Delhi.

**Objective:** The present study was designed to evaluate the variability of peripheral vasoconstriction among peoples during mental imagery of motor activity (motor imagery).

**Methods:** Seventeen healthy subjects following the 2 min baseline recordings, initially, imagined the act of pressing the hand grip dynamometer kept in dominant hand with maximum contraction (mental imagery of

contraction; Mc) without actually contracting the muscle for 30 sec. Later, they were given a ready signal followed by a command accordingly they either contracted with maximum force (actual contraction, Ac) for 30 sec or didn't contract (no contraction, Nc). The three trials for each condition were given for each subject and responses were averaged. The EMG from dominant arm and pulse volume amplitude (PVA) using photoplethysmograph from middle finger of the contralateral hand were recorded. The decrease in PVA was taken as measure of peripheral vasoconstriction. Recordings were assessed in three bins (initial bin, IB; middle bin, MB; last bin, LB) of equal duration and variability in responses was assessed by grouping the subjects on the basis of amount of peripheral vasoconstriction during IB of Nc.

**Results:** Subjects were divided in Group A (those with >20% decrease of PVA, n=9) and Group B (those with <20% decrease of PVA, n=8). The two groups had significant difference ( $p<0.01$ ) in vasoconstriction during IB of mental imagery and this significant difference was maintained from initial bin till last bin. However, vasoconstriction responses during AC were comparable.

**Conclusion:** Peripheral vasoconstriction during motor imagery is due to central command which is dependent on subjective sense of effort. Thus people differ in their subjective sense of effort during motor imagery, which is not evident during actual hand grip exercise.

### **Adverse drug reaction monitoring in patients on microtubule-damaging antineoplastic drugs (taxanes and vinca alkaloids) in a tertiary care hospital**

O20

Hasitha DM<sup>1</sup>, Sharma A<sup>1</sup>, Adiga S<sup>1</sup>, Bairy KL<sup>1</sup>, Thomas J<sup>2</sup>

1Department of Pharmacology, 2Department of Medical Oncology, Kasturba Medical College, Manipal University, Manipal - 576104, Karnataka, India

**Objectives:** 1) To collect data of the adverse drug reactions (ADRs) in oncology ward 2) To assess the causality of adverse drug reactions 3) To report the same to National Pharmacovigilance centre, CDSCO.

**Materials and Methods:** Data on adverse drug reactions were collected from the patients admitted in Oncology ward of Kasturba Hospital, Manipal from Sep 2012 - Aug 2013. Patients demography, drug, dose, type of ADR, severity, causality and outcome of the treatment of ADR were noted and reported in the CDSCO form. This was uploaded on the Vigiflow database for assessment by National Pharmacovigilance centre.

**Results:** Of the 700 ADRs reported in the hospital during the above period, 91 ADRs were from patients on microtubule-damaging anticancer drugs admitted in Oncology ward. The frequently reported ADRs among taxanes were diarrhea (17.9%), anaemia (17.9%) followed by candidiasis (12.5%). The most common drug causing these ADRs was paclitaxel (54.9%). The frequently reported ADRs among vinca alkaloids were febrile neutropenia (22.9%) followed by candidiasis (20%). The most common drug causing these ADRs was vincristine (38.5%).

**Conclusion:** The pattern of ADRs reported in our hospital will help clinicians for optimum and better use of most commonly used anticancer drugs.

## Comparison of Pain Response in Male Children and Young Adults

O21

Indu Saxena<sup>1</sup>, Anjali Verma<sup>2</sup>, Manoj Kumar<sup>3</sup>

1: Assistant Professor, Department of Biochemistry, AIIMS Jodhpur, Rajasthan

2: Research Scholar, Department of Physiology, TMMC & RC, TMU, Moradabad, UP

3: Professor, Department of Physiology, TMMC & RC, TMU, Moradabad, UP

**Background and Objectives:** Response to experimental pain depends on the nature of the stimulus as well as on the race, culture, and gender of the individual. This study was conducted to determine the effect of age.

**Methodology:** Experimental pain was produced by cold pressor task in 27 male children (9-15 years) and 30 young male adults (18-25 years). Pain response was monitored in terms of pain sensitivity (pain threshold, tolerance, and rating) and cardiovascular reactivity (CVR) (increase in pulse, systolic, and diastolic blood pressure).

**Results:** Resting pulse was higher and resting blood pressure was significantly lower in children. Although pain threshold was higher in children (Mean 30.6s compared to 18s), pain tolerance was significantly higher in young adults (Mean 49.1s compared to 6.54s). There was no significant difference in pain rating on the visual analog scale. There was no significant difference in the parameters of CVR.

**Conclusion:** Tolerance to experimental pain increases with age in young Indian males. This could be due to higher number of painful encounters with age leading to decreased pain sensitivity.

**Author for Correspondence:** Prof. Manoj Kumar, Head, Department of Physiology, TMMC & RC, TMU, Moradabad, Email: premmanoj2001@yahoo.co.in

## Antiepileptic activity of *piper longum* linn. fruit extract in rats.

O22

Janardhan Singh, Vivek Sharma, Jarnail Singh

Department of Pharmacology, Pt. BD Sharma PGIMS, Rohtak (Haryana)

**Objective:** To study effect of aqueous and alcoholic extracts from *Piper longum* fruit on rodent models of epilepsy.

**Methods:** Albino rats, weighing 120-150g, were screened for convulsions using Techno-Audiogenic test chamber and lag time (seconds) was noted in each rat. The rats were divided into 3 groups of 20 each, Group I-*P. longum* aqueous extract (100mg/kg, po), Group II-*P. longum* alcoholic extract (100mg/kg, po), Group III-Phenytoin (130mg/kg, ip). Drug treatment was given 60 min before exposure to the audiogenic stimulus. For MES model animals were divided into 4 groups of 10 each (Group I-Control, Group II-*P. longum* aqueous extract, Group III-*P. longum* alcoholic extract, Group IV-Phenytoin). Duration of hind limb extension (seconds) was noted in control and pretreated rats.

**Results:** In audiogenic seizure model *P. longum* aqueous and alcoholic extract pretreated rats showed complete protection in 40% and 50% animals respectively and delayed convulsions in the remaining rats. In MES model of epilepsy the aqueous and alcoholic extracts were effective in reducing duration of hind limb extension.

**Conclusion:** Aqueous and alcoholic extracts from *P. longum* prevent audiogenic and maximal electroshock seizures in rats.

**Correspondence address:** Dr. Jarnail Singh, Department of Pharmacology, Pt. BD Sharma, Jarnail Singh; Email: drjarnail@gmail.com

## Evaluation of an atypical antipsychotic, Olanzapine for its acute effects on anxiety in preclinical models

Jayaraj M, Shyamjith M, Rao S N.

O23

Department of Pharmacology, Yenepoya Medical College, Yenepoya University, Mangalore.

**Aims & objectives:** To evaluate Olanzapine for its acute effects on anxiety in Wistar albino rats by using elevated plus maze (EPM).

**Methodology:** Rats weighing 150-300g of either sex were divided into 3 groups of 6 animals each. Single dose of control (distilled water), test drug (Olanzapine 2mg/kg) and Standard drug (Diazepam 1mg/kg) were administered orally. One hour after administration of compounds, experiment was conducted using EPM.

**Results:** Animals treated with Olanzapine had significantly fewer open arm entries ( $P < 0.05$ ) & spent significantly less time in open arms ( $P < 0.05$ ) than their control treated counterparts which is suggestive of anxiogenic effect.

**Conclusions:** Observations suggest acute Anxiogenic effect of Olanzapine which is in contrast to results of other previous studies which reported anxiolytic effect.

**Corresponding address:** Jayaraj M, Dept. Of pharmacology, Yenepoya medical college, Yenepoya University, Deralakatte, Mangalore 575018. Email: drjayaraj1984@gmail.com

## A novel paradigm in viva-voce examination: objective structured viva examination (OSVE)

Jitendra R Patel, Anita P Verma

O24

Department of Physiology, Gujarat Adani Institute of Medical Sciences, KSKV Kutch University – Bhuj-370001. E-mail id: dr.jrpatel84@gmail.com

**Aims and Objectives:** To conclude utility and effectiveness of objective structured viva examination as a novel viva-voce examination tool in first year medical students.

**Method:** Study was carried out during periodic viva voce examination in physiology; there were total 147 students of first MBBS participate in this study. In OSVE there were total 6 sheet in which 10 questions/sheet (one copy to examiners and one copy to the students). Time given was 15 min. Feedback was taken from students by using like RT scale regarding utility and effectiveness of OSVE.

**Results:** Response of students on various aspects of OSVE like; regarding time (mean=4.42), number and content of questions (mean=4.15), subjective or objective bias (mean=3.75), effectiveness (mean=4.05), pattern of OSVE (mean=4.24) were obtained. Average mean of individual subject (mean=4.12). By individual response 78% (115) students were strongly agree or agree, 16% (24) neutral and 6% (8) strongly disagree or disagree.

**Conclusion:** The OSVE was very well appreciated by the students. The rational use OSVE was very effective tool for student assessment. So, at the end of study we can conclude that OSVE is novel tool for student evaluation. For future development OSVE should be included in university examination.

**Key words:** objective structured viva examination; Student; Evaluation tool; effectiveness.



## Vascular Endothelium in health & disease

O25

**Jyoti Kumar**

Head of Dept of Physiology, BPs Govt medical college khandpur kalan, Sonapat Haryana

Centuries ago, endothelium was supposed to be an inert wall paper covering the inside of arteries & veins. But it has been established now that endothelium may release substances that can profoundly affect the vascular tone & circulating blood elements. It is now well known that vascular wall plays a key role in the genesis of atherosclerosis, hypertension, reperfusion injury and restenosis. Endothelium also plays an important role in lipid metabolism.

The incidence of hypertension continues to increase, largely because it progressively damages the cardiovascular system. Pre-hypertensive blood pressure levels are also associated with an increased risk of cardiovascular disease (CVD). Endothelium secretes endothelium-derived relaxing factors (EDRF) as well as endothelium-derived constricting factors (EDCF). Both collectively mediate the vasomotor tone. Prostacyclin is produced by endothelial cells, while thromboxane A<sub>2</sub> by platelets from their common precursor arachidonic acid via the cyclo-oxygenase pathway. Thromboxane A<sub>2</sub> promotes platelet aggregation and vasoconstriction, whereas prostacyclin inhibits platelet aggregation and it has potent vasodilatory, anti-growth and anti-thrombotic actions. Endothelium plays a crucial role in the genesis of atherosclerosis, hypertension etc.

## Is motor slowing is a universal phenomenon of aging? Study correlates the effect of aging on psychomotor speed.

O26

**Kamini Ramdas Ilamkar**

Assistant Professor, Physiology department, Government Medical College, Nagpur. Maharashtra State, India.

**Aims:** The study was designed to evaluate the effect of the psychomotor speed with aging on healthy controls and was compared within age groups (mean±SD) to reach any statistical difference.

**Objectives:** The purpose of study was to correlate the effects of aging on dopamine receptor, prefrontal cortex & psychomotor speed. Speed of perception, speed of initiating the response and speed of movement are all involved in psychomotor performance. Reaction time is mainly a centrally determined function. Its slowing with advancing age is based on various age-induced changes that occur in central nervous system.

**Methods:** The study population consisted of 141 healthy volunteers in early adulthood 20 to 39 years (n=46), middle adulthood 40 to 59 years (n=52) & late adulthood 61 to 82 years (n=43) groups. The order of the procedure 1) Folstein Mini Mental State Examination for cognitive disability 2) Hamilton Rating Scale for Depression. 3) A survey questionnaire (questions including health, demographics and dominance). 4) Simple reaction time measurement by using a response analyzer. Statistical analysis was done by using unpaired t-test.

**Results:** It was observed that there is slowness of psychomotor speed with increasing age.

**Conclusions:** Reduced dopamine receptor density, potential biomarkers of aging, might affect dopamine signalling particularly in attention and executive processes, playing a key role in coordinating activity patterns in distinct regions of the neocortex & thus modulates cortico-limbic inputs, including afferents from the prefrontal cortex. Thus motor slowing is a universal feature of human aging commonly expressing human senescence.

**Keywords:** aging, dopamine receptor, psychomotor speed, prefrontal cortex.

**Corresponding address:** DR. Kamini Ramdas Ilamkar, Plot NO.9, Parth Apartment, S.E. RLY Colony-2, Telecom Nagar, Nagpur 440022. Maharashtra, India. **Email Address:** kamini\_ilamkar@yahoo.co.in.

## Spirometric lung function test among dyspneic patients attending outdoor department and indoor ward of respiratory medicine, RIMS Imphal

O27

Kanmi Ningshen<sup>1</sup>, W.Kanan<sup>2</sup>, W.Asoka Singh<sup>3</sup>

Physiology Dept RIMS, Imphal E mail id : kanminingshen@yahoo.in; 1Dr.Kanmi Ningshen PGT Physiology Department, RIMS Imphal; 2Dr.W.Kanan Professor Physiology Deptt RIMS Imphal; 2Dr.W.Asoka Singh Prof and Head Respiratory Medicine Deptt RIMS Imphal

**Aim :** The present study is aimed at the grading of severity of dyspnea and to identify functional lung impairment in dyspnea.

**Methods:** A cross-sectional study was conducted on 60 patients with complaints of dyspnea, attending the outdoor department and indoor ward of respiratory medicine, RIMS Imphal. The study includes both the sexes. The patients are graded on the dyspnea scale of Modified Medical Research Council (MMRC) Dyspnea Scale and Spirometric lung function test done at the time of presentation. Pulmonary function test parameters include Forced Vital capacity (FVC), Forced Expiratory Volume in first second (FEV1), FEV1/FVC, Peak Expiratory Flow Rate (PEFR), Forced Expiration Flow rate (FEF25-75%). The results are compared with the predicted against the different gradings of dyspnea.

**Result:** There is a significant reduction in FVC, FEV1, FEV1/FVC, PEFR, FEF25-75% as the grading of dyspnea increases from grade 0 to grade III, whereas grade IV shows no significant changes from grade III. Analysis of the sub-groups shows Grade 0 having no statistically significant changes of spirometric parameters.

**Conclusion:** The deterioration in lung function parameters is directly related to the severity of dyspnea as graded by MMRC dyspnea scale.

## Effect of submaximal exercise on airway mechanics in young healthy volunteers

O28

Ketaki Poorey, and Elvy Oommen

**Aim :** To compare airway mechanics before and after sub maximal exercise in young healthy subjects.

**Objectives:** (1)To measure and compare FEV1, FEF25-75% and FEF75-85% before and after exercise in young healthy volunteers. (2) To find effect of active/sedentary lifestyle on FEV1 change to exercise.

**Method:** First baseline pulmonary function test was done, and then volunteers were asked to exercise on the treadmill, so that, they achieved 80-90% of the maximum predicted heart rate for 5 minutes. PFT was recorded immediately after completion of the exercise challenge and subsequently at 5, 10 and 20 minutes of recovery period.

**Results:** Analysis indicated bronchodilation after exercise challenge as FEV1 increased ( $3.41 \pm 0.37$  Vs  $3.51 \pm 0.38$ ,  $p < 0.05$ ). Post exercise recovery showed increase in all measured parameters from the baseline but maximum change was seen in FEF75-85% = 14.53% ( $1.30 \pm 0.51$  Vs  $1.46 \pm 0.54$ ,  $p = 0.01$ ). Participants with sedentary lifestyle had a lower increase in FEV1 after exercise ( $0.70 \pm 6.22$ ) than those having active lifestyle ( $5.85 \pm 7.75$ )

**Conclusion:** Exercise challenge causes bronchodilation (due to inhibition of resting vagal tone) which is distinct in the peripheral airways. It can be applied clinically to screen asymptomatic smokers, as peripheral airways are first site to get involved. Thus abnormality may be detected before any irreversible damage.

**Corresponding address:** Dr Ketaki Poorey, Address: D-202, Samrajya2, Silver Arcade, Akota, Vadodara (Gujrat) Mobile number: 9909953548, Email ID: ketakipoorey@gmail.com

## A comparative clinical study on the efficacy and compliance of controlled release morphine (CRM) with immediate release morphine (IRM) in cancer pain management.

029

Kiran Roy, Pratibha Nadig, B N Srinivas

Department of Pharmacology; Vydehi Institute of Medical Sciences and Research Centre

**Aims And Objectives:** The present study was undertaken to compare the efficacy of (CRM) with (IRM) in terms of: Pain intensity (PI) , compliance, and the use of additional non- opioid analgesics in cancer pain management.

**Methods:** It was a randomized open labeled comparative clinical trial of CRM with IRM in cancer pain management. 60 patients with moderate to severe pain were chosen for study. The dose was titrated till pain reduced to moderate or mild intensity assessed using the categorical scale. Then the patients were randomized into two arms, each receiving either IRM (n=30) or CRM (n=30) at the required doses for the next 4 days. Pain intensity was assessed on a daily basis using the above scale. The percentage reduction in pain intensity score from Day 1 to Day 4, the compliance and need for additional adjuvant non-opioid analgesics were observed. Results were analyzed using students t test and chi square test. A p value of 0.05 or less was considered statistically significant.

**Results:** The mean pain intensity score between the two groups of patients, IRM (3.58±1.11), and CRM (3.44±0.69), was not statistically significant.  $p=0.578$ . Mean percentage compliance was statistically similar in two groups of patients with  $p=1.000$ . Two patients (6.66%) in the IRM group however received non opioids in addition to receiving morphine. None from the CRM group received non opioids. The proportion of patients getting converted from moderate/severe pain intensity to mild intensity in CRM was greater than IRM.

**Conclusion:** From the above results it can be concluded that CRM is similar to IRM in terms of efficacy and compliance. More number of patients seem to benefit from CRM. Hence this formulation of morphine can be used as an alternative to treat cancer Pain.

**Corresponding Address:** #42 Type 5 Block 3, NIMHANS Quarters, BRC Campus, Hosur Road, Bangalore-560029

## Animal experiments in an undergraduate curriculum – a students’ perspective.

030

L. Suresh Roy

Associate Professor, Department of Physiology, Regional Institute of Medical Sciences, Imphal, Manipur-795004

**Objectives:** This study was conducted to assess the opinions of the medical students regarding animal experiments in physiology subject as part of existing undergraduate medical education.

**Methods:** A survey was conducted among the third semester MBBS students studying in Regional Institute of Medical Sciences, Imphal during the period of August to September, 2013 through a semi-structured and self-administered questionnaire.

**Results:** Most of the students were of the opinion that they were conducted to fulfill the main objectives in the Physiology syllabus. They felt that it is a sheer waste of time to perform the experiments individually. Instead they prefer demonstrations of the experiments by the teaching staff. On the other hand, they felt that the experiments could be substituted by other alternative and better methods like computer-simulation experiments. Majority of them weren't aware of the recent ban of animal experimentation in medical colleges and suggestion of alternatives to animal experiments.

**Conclusion:** This study seems to provide explanation that the animal experiments may be substituted by other better experimental models as suggested by Medical Council of India (MCI).

**Key words:** MBBS students, animal, experiments, MCI

## **Study of the relationship between initial autonomic functions and subsequent motor and sensory recovery, in traumatic cervical spinal cord injury patients.**

**Latha. N. and Elizabeth Tharion**

031

Department of Physiology, Christian Medical College, Vellore.

**Aim:** To study if assessment of autonomic pathway integrity in traumatic cervical spinal cord injury quadriplegic patients is useful for prognostication.

**Objectives:** To study the (1) correlation between short-term Heart rate Variability (HRV) indices at the time of admission of quadriplegic patients and the change in motor and sensory score at the end of the rehabilitation programme and (2) association between presence or absence of SSR at the time of admission and subsequent recovery.

**Methods:** HRV indices computed in 16 ASIA grade A/B patients at the time of admission were correlated with the change in motor and sensory scores at the end of the rehabilitation programme using Spearman's correlation coefficient. Chi square test was used to study the association between the presence or absence of SSR at the time of admission and the change in ASIA grade at the end of the rehabilitation programme.

**Results:** There was no statistically significant correlation between the HRV indices and the change in motor and sensory scores. Neither was there any statistically significant association between the presence or absence of SSR at the time of admission and the subsequent improvement in ASIA grade.

**Conclusion:** The findings of the present study indicate that HRV indices and SSR are not useful parameters to prognosticate recovery in traumatic cervical cord injury quadriplegic patients.

**Corresponding address:** Dr. N. Latha, Final year PG, Department of physiology, Christian Medical College, Bagayam, Vellore – 632 002. E- mail: latha2011@cmcvellore.ac.in; Dr. Elizabeth Tharion, Professor of Physiology, Department of Physiology, Christian Medical College, Bagayam, Vellore – 632 002. E-mail : e.tharion@cmcvellore.ac.in

## **Effect of prenatal exposure to ethanol on the pup quality and exploratory behaviour in Wistar rats.**

032

**Mitha .K.V., Saraswati Yadav, Santhosh Mayannavar, Ganaraja.B.**

Department of Physiology, Kasturba Medical College, Mangalore (A unit of Manipal University) Karnataka, India

**Aim and Objective:** Aim of the present study was to examine the effect of female alcohol intake on birth weight, crown length, litter size and cognitive functions of their offspring.

**Methods:** Female rats were divided into control and alcoholic group. Rats in alcoholic group were orally fed with 30% alcohol dissolved in water (5g/kg body weight), treatment was started 14 days before mating, throughout their gestation period and continued up to weaning period. Control group were administered with equivalent volume of water. Offspring from each group were divided into two, male and female offspring group. Birth weight, crown-rump length, litter size were taken from the day of delivery, whereas cognitive function test were done from 75th day of post natal life.

**Results:** There was no change in the birth weight, crown length, litter size passive avoidance test, grooming and, rearing score, number of squares entered in central area, but it showed a significant change in the number of squares entered in the peripheral area ( $p < 0.05$ ) and also in the defecation score ( $p < 0.05$ ).

**Conclusion:** This study shows that prenatal exposure to alcohol increases the motor activity and exploratory behaviour and emotional status of their offspring.

Key words: Alcohol, pup quality, open field, passive avoidance

**Corresponding address:** Mitha K.V, PHD JRF, Department of Physiology, Kasturba Medical College, Mangalore. (A Unit of Manipal University) Karnataka, India. E mail Id: mithakv@yahoo.com

033

## **Antidiabetic and antioxidant activity of hydroalcoholic extract of peel of *Punica Granatum* in Albino Rats.**

**Narayansamy S, Kartik J. Salwe Devender O. Sachdev, K. Manimekalai, Yogesh Bahurupi**

**Aims:** To find out Antidiabetic and antioxidant activity of hydroalcoholic extract of Peel of *Punica Granatum*.

**Method:** Diabetes was induced in overnight fasted adult Wister strain albino rats weighing  $160 \pm 10$  g by single intraperitoneal injection of freshly prepared STZ. Rats with blood glucose level above 200 mg/dl were considered diabetic and included in the study. The animals were divided into five groups of six animals in each. The Five groups were named as Normal control, Diabetic control, Peel extract 100 mg/kg, Peel extract 200 mg/kg and Glibenclamide respectively. Fasting Blood Sugar (FBS) was recorded on 1st, 7th, 14th, 21st and 28th day. Higher dose and Glibenclamide significantly lower blood glucose level from day 14th day onwards but Glibenclamide was found to be more effective. Lower dose significantly lowers blood glucose level from 21st day but less effective than Glibenclamide and higher dose. Glibenclamide followed by higher dose was found more effective in reducing plasma TBARS and increasing levels of Super oxide dismutase and Catalase indicating a protective role of the extract.

**Conclusion:** Peel extract of *P. Granatum* possesses significant hypoglycemic activity; this may be due to antioxidant activity. Further studies are required to determine the exact mechanism.

**Corresponding address:** Dr. Kartik J. Salwe, Assistant professor, Department of Pharmacology, MGMCRI, Pillaiyarkuppam, Puducherry

## **A Study on Knowledge, Attitude and Practice on Blood Donation among Health care Professional Students in Rajarajeswari Medical and Dental College, Bangalore, Karnataka.**

**Neelkanth Kote, Shilpa M, Ranganath M.D**

034

**Aims:** To understand the various factors contributing to knowledge, attitude and practice of Voluntary Blood Donation (VBD) among health care professional students.

**Objectives:** The study aims to assess the level of knowledge, attitude and practice regarding blood donation among the health care medical and dental students.

**Methods:** A cross-sectional study was conducted among 200 health care medical students from Rajarajeswari Medical College and Rajarajeswari Dental College, Bangalore, Karnataka.

**Results:** Overall knowledge on blood donation among respondents was 48 %. Majority of non-donors showed positive attitude 82 % by expressing their willingness to donate blood if they were asked to donate blood .About 5% of the non-donors don't know the importance of blood donation

**Conclusion:** This study deeply suggests that even the healthcare student community needs to be educated about the importance and health benefits. There should be a strong focus on blood donation awareness and motivation of blood donation on regular basis.

**Key words:** Blood Bank; Voluntary Blood Donation; Health care professional students

## Occupational exposure to dust on respiratory system: an alarming trend

035

**Praveen Patil and Shivanand K G**

Department of Physiology, Raichur institute of medical sciences, Raichur. Karnataka-584102 Email:praveenkmc@gmail.com

Chronic obstructive pulmonary disease (copd) is a major cause of morbidity and mortality in many countries including India. COPD is projected to be ranked 5th as a worldwide burden of disease according to a study published by the world health organization. Yet COPD fails to receive adequate importance from health care community and by the government officials. Workplace exposure to various chemicals, which may be absorbed or inhaled, can affect airways directly or cause bronchial mucosal inflammation. Data on such exposure in a particular geographical area can give the reflection of social and mental status of the community residing. This prospective study aims at exploring the association between occupational exposure and the risk of developing COPD and suggesting the preventive measures.

**Key words:** COPD, sawmill workers, occupation

## EFFECT OF LIMB DOMINANCE ON THE NERVE CONDUCTION VELOCITY & COGNITION STUDY IN HEALTHY MEDICAL STUDENTS

036

**R.G. Latti, M.R. Medical College, Gulbarga**

**Introduction:** In recent years, electrodiagnostic studies play a major role in the assessment & diagnosis of patients with various neuromuscular disorders. Various physiological factors like age, gender, height, temperature also affect the nerve conduction studies. However, very least attention in research is towards the limb dominance.

**Aims & Objectives:** The present study was planned to assess the effect of limb dominance & cerebral dominance on motor as well as sensory nerve conduction velocities.

**Materials & Method:** In the present study, 50 right handed & 50 left handed healthy medical students decide to be volunteers. The volunteers will be selected randomly, age group ranging from 18- 25 years, with no history of any illness, medication, addiction etc. from student record sheet. The median nerve conduction velocity was measured by using Clarity Medicare's OCTOPUS-2 – Channel EMG Machine available in our Department. Edinburgh Handedness Inventory was used to determine limb & brain dominance questionnaire, Luciano Maviani, was used to determine cerebral dominance. Cognition test by PGI Memory Scale Chandigarh.

**Results:** In our study, there was no statistical significant difference ( $P < 0.05$ ) found in the velocity between dominant & nondominant hands & cognition test. The cognition score was found slightly higher in left handed participants.

**Conclusion:** From our study, we may conclude that limb dominance may partially affect on nerve conduction velocity & cognition functions.

## A comparison of respiratory functions of people living in urban, rural and semi-urban areas of select districts of Tamil Nadu

037

<sup>1</sup>Ramya K, <sup>2</sup>S.Roopa, <sup>2</sup>Priscilla Johnson, <sup>2</sup>R.Padmavathi, <sup>2</sup>Madhusudhan Rao, <sup>2</sup>A.S.Subhashini, <sup>3</sup>Santhu Ghosh, <sup>3</sup>Rajkumar

1Department of Physiology, ACS Medical college and Hospital Chennai, 2Department of Physiology, Sri Ramachandra Medical College & Research Institute, Sri Ramachandra University, Chennai, 3Department of Environmental Health Engineering, Sri Ramachandra Medical College & Research Institute, Sri Ramachandra University, Chennai.

**Background and objectives:** Air pollution is known to produce profound ill effects. A lot of studies have been done on the adverse effects of air pollution in cities but studies from rural and semi-urban population are limited. Hence this study was done to assess and compare the lung functions of urban, semi-urban and rural population of select districts of Tamilnadu.

**Methodology:** The present cross sectional study was conducted among 231 subjects, of both genders, aged between 20 to 60 years, residing in their respective present localities for  $\geq 10$  years. Medical and exposure history were collected and anthropometric measurements were taken. Pulmonary functions (forced vital capacity [FVC], forced expiratory volume in 1 second [FEV1] and peak expiratory flow rate [PEFR]) were measured using a portable spirometer.

**Result:** Data were analyzed by one way ANOVA and 't'test. The lung functions of semi-urban population were significantly lower than that of rural and urban population. The lung functions of rural population were significantly higher than that of urban and semi-urban population.

**Conclusion:** This study has highlighted the respiratory burden faced by the semi-urban communities in developing countries. The semi-urban communities perhaps face the highest exposures from both indoor (solid fuel) and outdoor (vehicles, industries etc.) sources.

**Key Words:** pulmonary functions, rural, semi-urban, urban.

**Corresponding address:** Ramya K, Email: ramyakumar\_2006@yahoo.co.in.

## Hepatotoxic activity of Artesunate in Wistar albino rats.

038

Ranjita, Shyamjith M, Rao S N.

Dept of Pharmacology, Yenepoya Medical College, Yenepoya University, Mangalore

**Aim:** To study the effect of Artesunate, the antimalarial drug on liver.

**Objective:** To observe the effect of Artesunate on liver in Wistar albino rats.

**Methods :** For studying the effect of Artesunate on the liver, Wistar albino rats were used after obtaining ethical committee clearance. Animals were divided into two groups, Group I received only distilled water i.p and Group II was administered artesunate i.p at a dose of 110mg/kg. They were administered the respective agents for 14 days. On 15th day, the blood was collected under ketamine anaesthesia and sent for liver function tests [LFT].

**Results :** The LFT result showed that there were a significant rise in the levels of Aspartate transaminase, Alanine transaminase, Alkaline phosphatase and bilirubin levels in the serum of animals received artesunate (group II) on comparing with the animals of group I.

**Conclusions :** The above results clearly indicates that the newer antimalarial drug has a potential to cause drug induced liver injury. It has to be cautiously used in patients who are having existing liver ailments.

**Corresponding address:** Ranjita, Department of pharmacology, Yenepoya Medical College, Deralakatte, Mangalore 575018 Email: dr.ranjtak@gmail.com

### Evaluation of cognitive function in subclinical hypothyroid patients.

039

**Rashmi Mahaur, Aarti Sood Mahajan, A.K.Jain, Tijender Singh, Dinesh Kumar Dhanwal, Meena Gupta.**

**Aim and Objectives:** We evaluated cognitive function of patients with subclinical hypothyroidism using event related potentials (P300).

**Materials and methods:** 30 females aged 30-50 years diagnosed with subclinical hypothyroidism (group1) were compared with 30 age and sex matched hypothyroid patients (group2) and euthyroid controls (group3). Cognitive functions were evaluated using three parameters MMSE, P300 (latency and amplitude) and reaction time (audio and visual).

**Result:** In subclinical hypothyroid patients mean P300 latency was found to be significantly delayed with value at Fz  $337.57 \pm 23.84$  ms, Cz  $333.07 \pm 27.96$  ms, Pz  $336.93 \pm 34.84$  ms compared to mean P300 value at Fz  $308.90 \pm 11.90$  ms, Cz  $307.17 \pm 12.65$  ms, Pz  $308.34 \pm 10.48$  ms in euthyroid controls. The mean audio and visual reaction time, both were significantly prolonged in subclinical hypothyroid patients compared to euthyroid controls.

**Conclusions:** Delayed latency of P300 wave and prolonged reaction time in both hypothyroid and subclinical hypothyroid cases in spite of normal MMSE score warrants the use of P300 to diagnose cognitive decline in subclinical hypothyroid patients.

**Corresponding address:** Dr. Rashmi Mahaur, Room no. 246, 2nd floor, Department of Physiology, Pathology Block, Maulana Azad Medical College, New Delhi- 110002. Email: drrashmi1501@gmail.com

### Clinical profile and therapeutic outcome of Falciparum Malaria patients in a tertiary care hospital

040

**Sanitha Kuriachan, Bharti Chogtu Magazine, Jayaprakash B**

Department of Pharmacology, Department of Medicine, KMC, Manipal

**Objective:** To study the clinical profile and therapeutic outcome of patients with Plasmodium falciparum malaria in a tertiary care hospital

**Methodology:** A retrospective observational study was conducted in the Department of Medicine, Kasturba hospital, Manipal to study the clinical presentation, diagnosis, treatment and outcome of P. falciparum malaria. Data of patients diagnosed and treated as P. falciparum malaria from January 2012 to July 2013 were obtained from case records in Medical records library.

**Results:** Data from 100 patients; of which 85% were males was recorded. Mean weight was  $62 \pm 15$ kg. Common presenting symptoms were fever (97%), vomiting (44%), jaundice (37%), headache (35%). Median duration of hospital stay was 7 days. 28% of cases were diagnosed with severe malaria of which 7.5% was cerebral malaria. Severe anemia was seen in 3.8% cases. Thrombocytopenia was seen in 91% cases; 15% was grade 4 thrombocytopenia requiring transfusion. Hyponatremia was seen in 68% patients. Artesunate combination therapy was given in 75% cases. 95% patients improved and 3 patients died of complications. Resistance to



treatment was seen in 8% of cases. 34% patients tolerated antimalarial drugs well, while 68, 28, 25 % patients developed anemia, headache and vomiting respectively.

**Conclusion:** Such studies will help in preventing ADRs and improving clinical outcome.

**Corresponding address:** Dr. Bharti Chogtu Magazine, Associate Professor, Department Of Pharmacology, Kasturba Medical College, Manipal. Email: bhartimagazine@gmail.com

### Protective effects of fish oil on diabetic brain damage in Wistar rats.

041

**Saraswati Yadav, Mitha K.V., Mamtha T Shenoy, Santhosh Mayannavar., Ganaraja.B.**

Department of Physiology, Kasturba Medical College, Mangalore (a unit of Manipal University) Karnataka, India

**Aims & Objectives:** To investigate the beneficial effect of dietary fish oil on STZ induced diabetic rats.

**Methods:** Adult, male, Wistar rats (n=18) were divided into three groups (n=6) viz. diabetic control, treated diabetic rats & normal controls). Diabetes was induced by an injection of STZ (48 mg/kg). The animals received either control or fish oil (0.5g/kgbw) for 40 days. Serum lipid profile, MDA and total antioxidants were estimated from the brain tissue homogenates. Passive avoidance and open field test was conducted.

**Results:** Fish oil diets significantly ( $p < 0.05$ ) lowered serum triglycerides and cholesterol levels in diabetic rats, while serum HDL-C was increased in fish oil treated rats. Fish oil diet significantly ( $p < 0.05$ ) reduced the MDA levels and increased the antioxidant levels in the diabetic rats. Memory was improved in fish oil treated rats as compared with diabetic rats as indicated by the passive avoidance test results. In open field test exploratory behaviour was improved in fish oil treated animals whereas other emotional behaviours like rearing and grooming remained unchanged.

**Conclusion:** Dietary supplementation with omega-3 fatty acids (fish oil) has demonstrated to have positive physiological effects on lipid metabolism, antioxidant level, oxidative status and cognition.

**Key Words:** fish oil, diabetes, streptozotocin, open field, passive avoidance, lipid profile, MDA, total antioxidant capacity.

**Corresponding address:** Mrs. Saraswati Yadav, PhD JRF, Department of Physiology, Kasturba Medical College, Mangalore (A Unit of Manipal University) Karnataka, India, Email id: saras.jaiswal@gmail.com

### The study of nerve conduction parameters in patients of hypothyroidism

042

**Satish Waghmare, Shobha Pajai, Sachin pawar and AR Chaudhari**

Department of Physiology, Mahatma Gandhi Institute of Medical Sciences, Sevagram.

**Objectives:** Hypothyroidism is caused by the low level of circulating thyroid hormones. Iodine deficiency is its most common cause in India. Metabolic alterations in hypothyroidism are responsible for peripheral neuropathy. Nerve conduction study is an effective method in revealing peripheral neuropathy in patients with hypothyroidism. Nerve conduction parameters are affected by dietary, environmental, geographical and ethnic factors. Therefore, it is reasonable to study nerve conduction alteration in hypothyroidism in this geographical set up of central India.

**Aim:** To study alterations in the nerve conduction parameters in patients with hypothyroidism.

**Methods:** Case control study was conducted on 100 subjects (50 cases; 50 control) aged 18 years and above. In all the subjects, motor and sensory nerve conduction study was performed using RMS EMG EP Mark-II.

**Results:** Mild sensory-motor axonal polyneuropathy was observed in 40% of the cases. Abnormal nerve conduction was observed prominently in sensory nerves especially in sural nerve. Distal latencies were significantly prolonged ( $P < 0.05$ ) with reduced amplitude and conduction velocities in cases as compared to controls.

**Conclusion:** The findings reflect that electrophysiological alterations may be the consequences of hypothyroidism and sensory neuropathy is the common manifestation in patients suffering from hypothyroidism in our geographical set-up.

**Corresponding address:** Dr. Satish Waghmare, Tutor, Department of Physiology, MGIMS, Sevagram (M.S.)  
E-mail: satishwaghmare@mgims.ac.in

## Faculty perspectives on the multi-component assessment system in physiology

043

**Sharmila Torke<sup>1</sup>, Reem Rachel Abraham<sup>1</sup> and Ramnarayan, K<sup>2</sup>**

<sup>1</sup>Department of Physiology, Melaka Manipal Medical College (Manipal Campus), Manipal University, Manipal 576104, Karnataka State, India.; <sup>2</sup> Vice Chancellor, Manipal University, Manipal 576104, Karnataka State, India.

**\*Corresponding author:** Dr. Sharmila Torke, Associate Professor and Head, Department of Physiology, Melaka Manipal Medical College (Manipal Campus), Manipal 576104, Karnataka State, India, Phone no: 91-820-2571201 ext-22519, Fax no: 91-820-2571905, E-mail: sharmilatorke@yahoo.com

**Objective:** This study was conducted to explore faculty perspectives on multi-component assessment system in Physiology at Melaka Manipal Medical College (Manipal Campus), India.

**Method:** Faculty feedback regarding the multi-component assessment system was collected by administering a 9-item questionnaire to the physiology faculty ( $n=12$ ) at MMMC, in order to study their perception about the adequacy and appropriateness of assessment methods in relation to course objectives in physiology. They were asked to rate each item using a five-point Likert scale (5=strongly agree, 1=strongly disagree).

**Results:** 9 of 12 faculty members agreed with the statements emphasizing the role of assessment system in assessing understanding, in testing appropriateness of the breadth of knowledge being tested and the contribution of each assessment component to the final exam and also in providing feedback to students. However, responses were mixed (7 satisfied and 5 not happy) regarding the quality of existing assessment tools and stress level of students as well as faculty members.

**Conclusion:** The multi-component assessment system helps students to identify strengths and weaknesses needing remediation. The system also helps teachers to think about innovative methods of teaching and assessment to improve the relevance of physiology in clinical practice and to modify question format in the succeeding examinations.

## New insight into scope of research in sliding filament theory of muscle contraction

044

**Shreechakradhar U Mungal, Sushil P Dube, Anandkumar M Dhole, N. D. Somwanshi, S.S. Karadkhedkar, M. B. Kulkarni**

Dept. of Physiology, Dr. S. C. Govt. Medical College, Nanded (Maharashtra) – 431602. Email Address: shreechakradharmungal@rediff.com

**Introduction:** All the current understanding about skeletal muscle contraction is based on sliding filament theory proposed by Huxley A.F. and Huxley H. E. independently in 1954. Since then many scientists are working on unresolved aspects of this theory. In 1973 Sir Andrew Huxley, himself addressed some unexplained issues in this theory.

**Aim:** The present study is aimed to find scope of research in sliding filament theory.

**Objective:** To determine whether sliding theory can explain the process of shortening when every Z disc is pulled by two myosin filaments in consecutive sarcomeres on opposite sides.

**Method:** We prepared a model based on sliding filament theory to study process of shortening with reference to position of Z discs.

**Result:** Shortening of sarcomere was not possible in context of sliding filament model because when one Z line is being moved towards center of one myosin filament, on contrary the same Z line is being pulled towards center of another myosin filament in adjacent sarcomere.

**Conclusion:** There is scope for further research to see whether there exists other mechanism of sliding of filaments during shortening.

**Keywords:** Sliding filament theory, muscle contraction

## Association of Platelet function and Hematocrit with anthropometric variables in donor's blood.

045

**Somesh Raju<sup>1</sup>, N S Verma<sup>1</sup>, Sunita Tiwari<sup>1</sup>, Tulika Chandra<sup>2</sup>, Jagdish Narayan<sup>1</sup>**

1Department of Physiology King George's Medical University, Lucknow, UP; 2Department of Transfusion Medicine, King George's Medical University, Lucknow, UP

**Aims & Objectives:** To evaluate the anthropometric variables of blood donors and to see the association of hematological parameters and platelet function with different parameters of anthropometry.

**Methods:** This is a cross sectional observational study conducted on 100 healthy male blood donors. Anthropometric variables i.e. Weight, Body mass index and Waist circumference of donor's were recorded. After 350 ml of blood donation, 5 ml blood collected and different hematologic parameters i.e. RBC count, MCV, MCH, MCHC, PCV and platelet count as well as function were performed. Obtained data of subjects were analyzed statistically by paired t-test and Pearson correlation coefficient.

**Results:** Majority (64%) of subjects was overweight or obese group. Significant association of weight with RBC count, MCV, MCH, MCHC and Platelet count were observed. Significant association of BMI was found with hematological parameters MCV and MCHC. Waist circumference also showed significantly correlated with hematological indices and platelet count.

**Conclusion:** Various anthropometric variables like BMI, body weight and waist circumference can give a quantitative idea of various hematological parameters (RBC, MCV, MCH, MCHC, PCV) including platelet count in blood of normal healthy normal donors.

**Key words:** body mass index, waist circumference, Mean corpuscular volume, mean corpuscular hemoglobin, Mean corpuscular hemoglobin concentration, Platelet function test.

**Corresponding author-** Dr. N S Verma, Professor, Department of Physiology, King George's Medical University, Lucknow UP, India E-mail: narsinghverma@gmail.com

## Intra ocular pressure changes in myopics and hypermetropics

046

**Sowjanya Mohan, Satyavati K, Biradar, Subash Chimkode, Raj Kumar Banner, Munniyappanavar, Varsha Akhade**

Department of Physiology, Bidar Institute of Medical Sciences, Bidar, Karnataka

**Aim:** To study the relation between intra ocular pressure & refractive errors.

**Introduction:** Intra ocular pressure (IOP) is the fluid pressure inside the eye. IOP is an essential entity in maintaining structural & functional integrity of the eye ball. Normal IOP varies between 10 to 20mmHg. The average value is 15.5mmHg with fluctuations of about 2.75mmHg. During night IOP usually decreases. IOP is influenced by various factors like exercise, heart rate, respiration, fluid intake, systemic medications, topical drugs, alcohol, smoking etc.,. IOP is also influenced by the refractive errors. Myopia is a refractive error also called as near sightedness where there will be difficulty in focusing the far objects. Hypermetropia is also a refractive error & know as long sightedness. In this hypermetropia, there is difficulty in focusing the near objects. Control of IOP within normal physiological range is necessary to maintain the anatomical conditions necessary for optimal refraction & thus vision. Several studies have shown there is an association between IOP and the refractive errors.

**Objectives:** To study the effect of myopia & hypermetropia on IOP by comparing the IOP of emmetropics.

**Materials And Methods:** This study was conducted in Ophthalmology Dept of Bidar Institute Of Medical Sciences, Bidar. 150 subjects within the age group 20 to 50years were selected and grouped under control group, study group 1 and study group 2 with 50 subjects in each group. 50 myopic subjects whose refractive status was examined using refractive tests were study group 1, 50 hyperopics whose refractive status was examined by refractive tests were group 2 and 50 emmetropics were the control group. With the exclusion criteria –alcoholics, smokers, diabetics, hypertensives, vitamin A deficiency, patients on eye medications & previous eye surgeries. IOP of the subjects was measured using schiottz tonometer. Results were analysed by applying 'annova' unpaired 'T' test with p value less than 0.05 were considered significant.

**Results:** The study showed IOP changes with the refractive errors with significant p value of 0.014.

**Conclusion:** This study showed a relationship between IOP & the refractive errors. IOP of myopics is significantly higher than the IOP of emmetropics and the IOP of hypermetropics is significantly less than the IOP of emmetropics.

## Evaluation of anxiolytic activity of hydroethanolic extract of roots, stems and leaves of *Coriandrum sativum* in mice.

047

Sridevi K, Rejeesh EP, Rao SN

Dept of Pharmacology, Yenepoya Medical College, Yenepoya University, Mangalore

**Aim & Objectives:** To investigate the anxiolytic effect of the hydroethanolic extract of roots, stems and leaves of *Coriandrum sativum* in Swiss albino mice.

**Methods:** The anxiolytic effect of the hydroethanolic extract of *Coriandrum sativum* was assessed using elevated plus maze and light and dark arena. The animals were divided into five groups (n=6); Group I received distilled water orally; served as normal control; Group II were administered the standard drug, diazepam orally and Group III, IV and V were administered hydroethanolic extracts *Coriandrum sativum* (roots, stems and leaves) . After the administration of drugs, the animals were screened for anxiolytic activity using elevated plus maze and light and dark arena.

**Results:** Hydroethanolic extracts of *Coriandrum sativum* (roots, stems and leaves) showed potential anxiolytic activity.

**Conclusion:** Our findings demonstrated that the hydroethanolic extract of *Coriandrum sativum* (roots, stems and leaves) exerted an anti-anxiety effect when compared to the control group and less anxiolytic activity than the diazepam treated group.

**Corresponding author :** Sridevi K, Dept of Pharmacology, Yenepoya Medical College, Yenepoya University, Derlakatte, Mangalore-575018. Email id : shettysri87@gmail.com

## Study of awareness of pharmacovigilance in MBBS undergraduates in a teaching hospital, KIMS, Nalgonda

048

Srujana P, Tadv NA, Venkat Rao Y.

Department of Pharmacology, Kamineni Institute of Medical Sciences, Sreepuram, Narketpally, Nalgonda, Andhra Pradesh.  
EMAIL ID: vasireddy.srujana@gmail.com

**Objectives:** To study the awareness of pharmacovigilance in second year MBBS students in a teaching hospital.

**Materials and Methods:** A questionnaire based observational study was conducted in 102 MBBS students. The questionnaire was tested prior to the study by conducting a pilot test and finding out Cronbach's alpha value (0.7). Time of 20 minutes was given to each student for filling the questionnaire. The students who were unwilling to fill the questionnaire were excluded from the study.

**Results:** 102 students completed the study 29 (28.43%) males and 73 (71.56%) females. 67 (65.68%) students defined pharmacovigilance correctly, and 46 (45.9%) students knew the purpose of pharmacovigilance. 93 (91.17%) students knew the term of adverse drug reactions (ADR), but only 34 (33.33%) students were able to define ADR correctly. Even though 41 (40.19%) students encountered adverse drug reactions in patients, only 6 (5.88%) students reported it.

**Conclusion:** The study indicated the need for creating more awareness in MBBS students regarding pharmacovigilance as lack of awareness is the major cause of under reporting. This study will be helpful for increasing the awareness of adverse drug reactions and attain more effective pharmacovigilance.

## Heart rate variability – a tool for early prediction of hypertension

049

**Surekharani Chinagudi.**

Associate professor, Department of Physiology, S.N.Medical College, Bagalkot, Karnataka. Email: csurekha.rani@rediffmail.com

**Background:** Hypertension or prehypertension are the diseases which affect entire body. Many times there would have been organ damage before the diagnosis of hypertension. So it becomes essential to diagnose hypertension or rather prehypertension at an early stage so that preventive measures can be employed. Heart rate variability (HRV) proves to be the best tool to diagnose prehypertension at early stage.

**Aim:** To record HRV in offsprings of hypertensive parents and offsprings of normotensive parents and compare results between them.

**Materials:** Study was done in IMBBS students (2011-2012) of S.Nijalingappa Medical College, Bagalkot. 20 cases were obtained and matched with controls; HRV was recorded in both groups using polyrite.

Statistical analysis was done by unpaired t test using EPI-info software.

**Results:** Time domain parameters were decreased in cases. Low frequency domain (LF) was higher and high frequency domain (HF) was lower in cases. LF/HF ratio was higher in cases.

**Conclusion:** There is increased sympathetic drive and decreased parasympathetic drive in cases compared to controls indicating autonomic imbalance in cases. If detected earlier, preventive measures can be undertaken to prevent prehypertension and subsequently hypertension in them.

## The study of Prevalence of different ACTN3 genotypes and their association with endurance performance in non-sedentary, non-athletically trained healthy young adult males.

050

**Tanaji Wankhede, Madhu Bhatt, S P Singh, Anuj Chawla, Nikhil Moorchang.**

**Aim:** To find association between ACTN3 genotypes and endurance performance in non-sedentary, non-athletically trained healthy young adult males.

**Objectives:** To estimate the prevalence of ACTN3 genotypes and to measure the endurance performances in 5 km run in ACTN3 genotypes.

**Methods:** PCR- RFLP method was used for genotyping 70 males and their 5 km run timings were recorded for endurance performance.

**Results:** ACTN3 genotype prevalence was RR 20%, RX 58.57% and XX 21.43%. The mean timings in seconds for 5 km run were RR (1331.86 ± 112.12), RX (1349.41 ± 101.63), XX (1264.60 ± 91.44). There was a significant difference between 5 km run timings between RX and XX group.

**Conclusions:** The distribution of ACTN3 genotype was close to Asian population as in previous studies. The absence of ACTN3 gene improves endurance performance in non-sedentary, non-athletically trained healthy young adult males. ACTN3 deficiency reduces the activity of glycogen phosphorylase and results in a fundamental shift towards more oxidative pathways of energy utilization.

**Corresponding address:** Maj (Dr) Tanaji Wankhede, Department of Physiology, Armed Forces Medical College, Pune-40 (Maharashtra) Fax Number: 020 26331580 Email: wankhede.tanaji@gmail.com

## Change in platelet count during pregnancy and puerperium in same woman

051

Tejashwini. V. Basarigidad, Vineet.S. Baljoshi, Kammar.K.F

Department of Physiology, Karnataka Institute of Medical Sciences, Hubli-22

**Aims and Objective:** Normal pregnancy involves many changes including alterations in hematologic parameters. Hematologic changes also involve changes in platelets during pregnancy. Therefore in the present study, the change in platelet count is studied during pregnancy and puerperium in the same women.

**Methods:** 30 pregnant women in the age group of 20 to 30 who registered in KIMS, Hubli were enrolled for the study. Platelet count is measured during pregnancy and puerperium in the same women.

**Results:** Values were analyzed statistically using paired "t" test. Platelet count is decreased during pregnancy compared to puerperium ( $p < 0.05$ ) which is statistically significant.

**Conclusion:** The decline in the platelet count during gestation possibly caused by increased destruction or hemodilution. This decline may also be a consequence of physiological increased fibrinolysis within the uteroplacental circulation to maintain blood flow. They also likely represent increased platelet consumption, leading to a greater proportion of younger and therefore larger platelets.

**Key words:** Platelets, pregnancy and Puerperium.

**Corresponding address:** Tejashwini.V. Basarigidad. P.G Student, Department of physiology, KIMS, Hubli-580022  
Fax number-0836-2373724; Email: teju23091987@gmail.com

## A study of the effect of acute exposure to high altitude on blood pressure control during orthostatic challenge in non-acclimatized lowlanders

052

Thyelnai Dawn Khaling, Rajeev Bajaj, S P Singh, Anuj Chawla, Gaurav Sikri, S K Ramphal, Anirban T Bhattacharya.

**Aim:** To study the effect of acute exposure to high altitude on the blood pressures on orthostatic challenge and the relationship between orthostatic change in BP and Acute Mountain Sickness (AMS) in non-acclimatized lowlanders.

**Objectives:** To compare the changes in supine-to-standing BP (orthostatic changes) recorded within 2 hours (Day1) of arrival & the orthostatic changes between 24-30 hours (Day2) of stay at high altitude.

**Methods:** The blood pressures of 53 fresh air inductees to high altitude were recorded after a 5 minute of rest in supine position and again at 1 minute & 3 minutes after standing. The recordings were first taken within 2 hours of landing and thereafter repeated between 24-30 hours of landing. The subjects were divided into two groups depending on whether they developed AMS or not (Group 1: AMS,  $n=22$ , Group 2: Asymptomatic,  $n=31$ ). The Orthostatic changes in Day 1 & Day 2 were analyzed statistically intra-group as well as inter-group.

**Results:** There was statistically significant increase in SBP as well as DBP from Day 1 to Day 2 in both the groups on orthostatic challenges. On comparison between the two groups, there was no significant difference in changes of pulse & blood pressure from Day1 to Day 2.

**Conclusions:** Within 24 hour of acute exposure to high altitude, both the SBP and DBP were significantly increased on orthostatic challenge in both the groups. Our study indicated that there is no significant change in control of blood pressure on orthostatic challenge in AMS cases.

**Corresponding address:** Dr (Sqn Ldr) Thyelnai Dawn Khaling, Department of Physiology, Armed Forces Medical College, Pune-40 (Maharashtra), Fax Number: 020 26331580, Email: dawn\_khaling@hotmail.com

### **Kynunerate microinjection at the preoptic area attenuates glutamate induced thermogenesis in free moving rats**

053

**Trina Sengupta, Ashok Kumar Jaryal, Hruda Nanda Mallick**

Department of Physiology All India Institute of Medical Sciences, New Delhi-110029, India

**Objective:** The preoptic area (POA) is the key neural structure for regulation of body temperature. Ionotropic and metabotropic glutamatergic receptors are presented in the POA. This study was carried out to investigate the preoptic glutamatergic receptor mechanism involved in thermoregulation in free moving rats.

**Method:** The study was conducted in 14 adult male Wistar rats, divided into 2 groups. Group A was microinjected with kynunerate (KYNA) followed by glutamate via a chronically implanted guide cannula above the POA and the group B was microinjected with glutamate at the POA. Brain temperature (Tbr) was recorded with a precalibrated K-type thermocouple placed near the hypothalamus and body temperature (Tb) was recorded by a preimplanted peritoneal transmitter. Temperature was recorded constantly for 2h preinjection and 4h postinjection of the drugs.

**Results:** Long-lasting increase in Tb and Tbr was induced by glutamate (0.14nM) microinjection in the POA. KYNA (0.11nM) injection before glutamate microinjection prevented the rise in Tbr and Tb for 1 h 45 min and 1 h 30 min respectively. Increase in Tb and Tbr after this period was significant when compared with time-matched control and vehicle control data.

**Conclusion:** Glutamate induced hyperthermia at the POA was attenuated by ionotropic glutamate receptor antagonist, KYNA. Preoptic ionotropic glutamate receptors may be playing a role in glutamate induced hyperthermia.

### **A study on analysis of cognition and brain stem auditory evoked potential in anemic persons**

**U. Kavitha, Nirmala.N**

Sri Venkateshwraa medical college & Research Centre, Ariyur, Pondicherry

054

**Aim:** To analyse the cognition and brain stem auditory evoked potential in anemic young adult women

**Objectives:** (1) To assess the cognitive function and brain stem auditory evoked potential in normal and anemic persons. (2) To compare the cognitive function and brain stem auditory evoked potential between normal and anemic persons.

**Methods:** A descriptive cross sectional study was conducted among normal and anemic persons. Biochemical parameters such as hemoglobin, serum iron were assessed to identify the anemia. Subjects were divided into two groups (n=30). Mini mental status examination, Wechsler memory scale (WMS-IV), Digit symbol substitution test were used to assess the cognitive function. Brain stem auditory evoked potential was recorded by using PHYSIOPAC PP4, medicaid system, Chandigarh.

**Results:** There was no significant difference in mean score of cognitive function tests between the groups. Brain stem auditory evoked potential also did not show significant increase in anemic group (p<0.05).



**Conclusion:** Mild anemia in young adult women won't have effect on cognitive function and brain stem auditory evoked potential.

**Corresponding address:** U. Kavitha., No.103, PG quatres, Sri Venkateshwraa medical college & Research Centre, Ariyur, Pondicherry. E mail id: kavikrish.u@gmail.com

## **Association of Insulin antagonist adipokines gene polymorphism, mRNA expression with metabolic risk factors in Pre & postmenopausal women.**

Vani Gupta<sup>1</sup>, Sandeep Kumar<sup>1</sup>, Supriya Mishra<sup>1</sup>, Nidhi Shirivastava<sup>1</sup>, Himani Kulshrestha<sup>1</sup>, Sameeksha Mishra<sup>1</sup>, Vandana Gupta<sup>4</sup>, Yashodhara Pradeep<sup>2</sup>, Sandeep Kumar<sup>3</sup>

Department of Physiology<sup>1</sup>, Department of Obst & Gyanees<sup>2</sup>, KGMU, UP, Lucknow

Director<sup>3</sup>, AIIMS, Bhopal, M.P

Department of Obst & Gyanees<sup>4</sup>, UPRIMS& R, Saifai Etawah, UP

O55

### **Introduction**

Insulin antagonist adipokines such as TNF- $\alpha$ , IL-6 and Resistin impart an essential role in lipid metabolism insulin sensitivity and energy expenditure. Disturbance of these peptides level could lead to metabolic diseases.

### **Aim & Objective**

The present study was design to investigate insulin antagonist adipokines (TNF- $\alpha$ , IL-6 and Resistin) gene polymorphism, mRNA expression and their correlation with metabolic risk factors, insulin resistance in pre and postmenopausal women.

### **Method**

This is a case control study. Total 455 women (premenopausal 225 & postmenopausal 230 with & without metabolic syndrome) were recruited for the study. The fat tissue was collected from the 120 women who underwent open abdominal surgery. Fasting blood samples were collected. Anthropometrical parameters and metabolic risk factors were measured. Serum TNF- $\alpha$ , IL-6, Resistin level and Insulin was estimated, adipokines gene polymorphism and TNF- $\alpha$ , IL-6 and resistin mRNA expression in VAT & SAT.

### **Result**

Homozygous mutant genotype and allele frequency of TNF-  $\alpha$  308 G/A & Resistin 420 C/G polymorphism were observed higher in pre and postmenopausal women with metabolic syndrome. In VAT as well as in SAT, TNF- $\alpha$ , IL-6, Resistin mRNA expression was significantly higher in women with metabolic syndrome as compare to pre & postmenopausal women without metabolic syndrome, while VAT mRNA expression of TNF-  $\alpha$  & IL-6 were observed high as compare to SAT mRNA expression in women with metabolic syndrome. Plasma glucose, serum TG and serum cholesterol, insulin and circulating TNF-  $\alpha$ , IL-6, resistin and leptin were found significantly high in women with metabolic syndrome.

### **Conclusion**

Women with high visceral adipose tissue are more prone for development of metabolic syndrome irrespective of their menstrual status as visceral adipose tissue is a good source for insulin antagonist adipokines. So high waist to hip ratio may be considered as one of the potential risk predictors for metabolic syndrome.

## Comparative study to correlate the Incidence Of Dysmenorrhoea and Total body fat distribution in Medical Students

056

Vidya.G, Syamala.B, Sri Nageswari.K, Kalpana.M, Pushpanjali

**Aim and objectives:** 1. To correlate incidence of dysmenorrhoea with physical activity and Body Mass Index (BMI). 2. To compute body age vis-à-vis actual age as per BMI and regional fat distribution. 3. To find out the correlation of BMI with Total fat and visceral fat distribution

**Materials and Methods:** Ninety age (18-20yrs) and sex matched medical students of same ethnic group and socio-economic status were selected. Demographic data were collected through a standard questionnaire. BMI was calculated from height and weight. Total body fat percent, visceral fat, Regional fat distribution and projected Body age were obtained by using OMRON body fat analyzer HBF-362 Karada scan. The subjects were divided into six groups depending on their BMI values. Control group consisted of group I (BMI<18.5) and II (BMI18.5-24.9). The data of overweight subjects (BMI=25-30, Group III) and obese subjects (BMI>30, Groups IV -VI) were pooled together as obese group. Data were statistically analyzed by Pearson Chi-square test and Analysis Of Variance (ANOVA).

**Results and Conclusions:** A significant positive correlation between BMI, total body fat percent, visceral fat and projected body age was obtained in groups II-VI( $p<0.01$ ). All these parameters increased progressively with increase in BMI in the above mentioned groups II-VI.

The mean age at which menarche was attained by the subjects was 12+2 yrs. Many (72%) of the subjects experienced dysmenorrhea and majority (93%) of the subjects with dysmenorrhea had normal menstrual cycles and 88% of them had no physical activity. A significant positive correlation between dysmenorrhea and physical inactivity was obtained ( $p<0.05$ ) and there was no significant correlation between BMI and dysmenorrhea in both the groups ( $p>0.05$ ).

## An evaluation of antinociceptive effect of venlafaxine and its interaction with morphine and naloxone in albino mice

057

Vinisha M Saldanha, Janaki R Torvi,

**Objective:** To evaluate the antinociceptive effect of venlafaxine in comparison with standard drug morphine and to probe its possible interaction with naloxone in albino mice.

**Methods:** Albino mice of either sex weighing 20-30g were divided into 5 groups of 10 animals in each. Group I received (0.9% NaCl ), Group II(Venlafaxine 22.5mg/kg ), Group III(Morphine 10mg/kg), Group IV (Venlafaxine 22.5mg/kg + Morphine 10mg/kg) and Group V(Venlafaxine 22.5mg/kg + Naloxone 4mg/kg ). All drugs were administered intraperitoneally. The animals were tested for analgesia 30, 60, 90 mins after drug administration using tail flick method and Tail clip method. The statistical analysis was done using students 't' test and analysis of variance (ANOVA).  $P< 0.05$  was considered as statistically significant.

**Results:** There was significant antinociception with venlafaxine as compared to normal saline with onset of action at 30 minutes and peak effect occurring at 90 minutes ( $P<0.05$ ). The activity of venlafaxine was not comparable to that of morphine ( $P< 0.05$ ) at 30, 60, 90 mins. The blockade of opioid receptors with naloxone, an opioid receptor antagonist showed no significant difference between control and venlafaxine with naloxone.

**Conclusion:** This study shows that venlafaxine has significant antinociceptive activity and the opioid system probably has a role in its antinociceptive effect.

**Keywords:** antinociception; venlafaxine; morphine; naloxone

**Corresponding address:** Dr. Vinisha M Saldanha, Department of Pharmacology, Karnataka Institute of medical Sciences, Hubli- 580021, e-mail: vinisha\_saldanha@rediffmail.com

## Sensitivity of Histamine - Mediated Gut Contraction Mechanisms is Greater in Neonates than in Infants In-Vitro

P1

A.K. Tiwari #, \*Abhinav Gupta (late), \*M.B. Mandal, and †A.K. Ganguly

\*Department of Physiology, †Department of Pediatric Surgery, Institute of Medical sciences, Banaras Hindu University, Varanasi, Pin - 221005, India. Corresponding Author#: mobile: 9935347757, email: tiwak4@gmail.com

**Aims:** Studies have suggested the role of histaminergic mechanisms in mediating contractions in stomach and gall bladder, but such mechanisms mediate contractions in other parts of gut specially small and large gut is not clear. Further, it is also not known whether sensitivity of such contraction mechanisms vary with age.

**Objectives:** Present in-vitro study was undertaken to assess the role of histaminergic mechanisms in mediating the muscle contractions in other parts of gut (mainly small and large gut) in pediatric age group with a comparative approach between neonates and infants.

**Methods:** 2 - 3 mm wide and 15 - 20 mm long longitudinal muscle strips were prepared from healthy gut muscle tissue obtained from the resected gut segment from neonates and infants undergoing resection and anastomosis operation. One end of the muscle strip was tied to curved end of the glass tube and another was fastened to a force transducer. The preparation with the tube was then transferred to a Dale's organ bath containing Kreb's Ringer solution maintainin the temperature at 28 °C, pH 7.4 and continuous bubbled with 100% O<sub>2</sub>. The tissue was allowed to stabilize for 30 minutes with initial tension of 0.5 gm and muscle contractions were recorded (control) on a recorder (Powerlab, AD Instruments, Australia). Histamine in different concentrations (0.01- 100 µM) was used and contractions were obtained for 2 minutes at each dose (n=6). The contraction at each concentration was calculated in gm/gm of tissue and were expressed as % of control. Maximum contraction was obtained at 100 µM.

**Results :** In neonatal muscle strips, contractility produced by 100 µM histamine at 0.5, 1.0, 1.5, 2.0 minute was 301.50 ± 104.61, 488.94 ± 188.50, 561.57 ± 220.74, 444.76 ± 157.15 (%) of control respectively. In infantile muscle strips, contractility elicited by 100 µM histamine at 0.5, 1.0, 1.5, 2.0 minute was 108.81 ± 3.42, 123.97 ± 5.08, 134.35 ± 7.86, 121.63 ± 6.06 (%) of control respectively. In both the groups, histamine induced contractions were completely blocked by chlorpheniramine (0.32mM). Results show that gut muscle contractility produced by histamine was significantly greater in neonatal tissues than infantile tissues (Mann-Whitney test, p value ≤ 0.05).

**Conclusion :** Therefore, present study suggests that the sensitivity of histamine induced muscle contraction mechanism is greater in neonates than in infants.

## A comparative study of post operative pulmonary functions in laparoscopic surgeries versus laparotomies

P2

Abdul Raof Omer Siddiqui

Department of Physiology, Shadan Institute of Medical Sciences, Ranga Reddy dist, Andhra Pradesh Email: sufyansiddiqui2000@yahoo.co.uk, Fax: 040-24198708/66669915

**Aim:** To prove that pulmonary complications are less in laparoscopic surgery.

**Objective:** To compare the recovery of pulmonary functions after laparoscopic surgery (LS) and laparotomy (LT).

**Methods:** 100 patients undergoing abdominal surgery under general anaesthesia (50 LS & 50 LT) were tested for pulmonary functions (Forced Vital Capacity [FVC], Forced Expiratory Volume at first second [FEV<sub>1</sub>], Peak Expiratory Flow [PEF] and Forced Expiratory Flow at 25% to 75% [FEF<sub>25%-75%</sub> ]) and blood gas analysis (pO<sub>2</sub> and pCO<sub>2</sub>) before surgery and on the second postoperative day.

**Results:** There was a decrease in FVC, FEV1, PEF, FEF<sub>25%-75%</sub>, pO<sub>2</sub> and pCO<sub>2</sub> to 65.9%, 66.9%, 64.9%, 66%, 92% and 99% respectively of the preoperative value following laparotomy and to 82.5%, 84%, 82.5%, 86%, 97.5% and 102% respectively of the preoperative value following laparoscopic surgery.

**Conclusion:** Post operative recovery of pulmonary function is faster in laparoscopic surgery in comparison to laparotomy.

### Protective effect of ascorbate against oxidative stress in hippocampal neuronal cells monitored with Raman spectroscopy

Abhaya Dutta,<sup>1</sup>Sreejata Chatterjee,<sup>1</sup> Rekha Gautam,<sup>2</sup>Siva Umopathy,<sup>2</sup> Sujit K Sikdar<sup>1\*</sup>

P3

Molecular Biophysics Unit, IISc, Bangalore, India and Dept. of Inorganic & Physical Chemistry, IISc, Bangalore, India

**Objectives:** Oxidative stress can induce central and peripheral neurodegenerative diseases. Reactive oxygen species or free radicals play a critical role in oxidative stress. Hydrogen peroxide in presence of metal ions produces hydroxyl radical, which induces peroxidation of major cellular components such as lipids, proteins and nucleic acids. Hence, the effects of hydroxyl radical on hippocampal neurons were studied to understand the molecular changes related to oxidative stress in neurodegenerative disorders.

**Methods:** Raman spectra were recorded from cultured hippocampal neurons incubated in the HEPES buffer in physiological condition. After recording the control spectra (before treatment), the incubation buffer was replaced with (i) the same buffer containing 0.2mM of FeSO<sub>4</sub> and 0.2mM of H<sub>2</sub>O<sub>2</sub> to yield 0.2mM of hydroxyl radical (ii) 0.2mM of hydroxyl radical with 1mM of ascorbate.

**Results:** Only hydroxyl radical treated cells showed changes in shape and evidence of opacity or nuclear fragmentation. Raman peaks related to proteins and nucleic acids progressively decreased till 60 min. However, when ascorbate and hydroxyl radicals were applied together, the morphological changes in neurons were minimal and the Raman peaks decreased initially but later recovered back to control level.

**Conclusions:** These results indicate the protective (anti-oxidative) effect of ascorbic acid.

**Corresponding address:** Molecular Biophysics Unit, IISc, Bangalore, India; Fax: +91-80-23600535; E-mail: sks@mbu.iisc.ernet.in.

### Effect of short term exercise on Cardiac autonomic function and stress hormone in hypertensive offspring

Abhigna Kulkarni,<sup>1</sup> Ravikiran Kisan,<sup>\*2</sup> Swapnali,<sup>3</sup> Vidya M Nadiger,<sup>2</sup> D V Deshpande<sup>2</sup>

P4

<sup>1</sup> MBBS Student, SSIMS & RC Davangere, Karnataka; <sup>2</sup> Department of Physiology, SSIMS & RC Davangere, Karnataka; <sup>3</sup> Department of Biochemistry, SSIMS & RC Davangere, Karnataka

**AIMS:** To study the exercise stress response in hypertensive and non hypertensive offspring

**OBJECTIVES:** 1. To compare the blood pressure, heart rate, heart rate variability, cortisol levels in hypertensive and non hypertensive offspring. 2. To compare the exercise response on the blood pressure, heart rate, heart rate variability, cortisol levels in hypertensive and non hypertensive offspring

**METHODS:** The study was approved by Institutional Ethical Committee. The study protocol was explained and written informed consent was taken from the volunteers. Detailed personal, medical history was taken. Resting blood pressure, HRV were recorded. Blood sample for cortisol assessment was collected. Then subjects were

performed exercise - Queens College step Test (QCT). After performance of QCT, blood pressure, heart rate, HRV were again recorded till the heart rate reached to baseline.

**RESULTS:** The study results showed that increased stress response in hypertensive offspring in terms of elevated heart rate, blood pressure and cardiac sympathetic activity when compared to non hypertensive offspring.

**CONCLUSIONS:** The study shows that the manifestation of hypertension in genetically predisposed persons begins before disease manifestation itself. Therefore people who are at risk for hypertension should start positive health style and disease preventive measures before clinical diagnosis.

\* **Corresponding author: Dr Ravikiran Kisan**, Department of Physiology, SSIMS & RC Davangere, Karnataka, drravikiran@kisan@gmail.com

## **Incidence of Undiagnosed Obesity, Hypertension, Proteinuria, and High Blood Glucose in Indian Males**

**Abhijeet Singh Barath<sup>1</sup>, Indu Saxena<sup>2</sup>, Manoj Kumar<sup>3</sup>**

P5

1: MBBS 2<sup>nd</sup> Year, AIIMS Jodhpur, Rajasthan

2: Assistant Professor, Department of Biochemistry, AIIMS Jodhpur, Rajasthan

3: Professor, Department of Physiology, TMMC & RC, TMU, Moradabad, Uttar Pradesh

**Background and Objective:** Rapid urbanization has led to life style changes in the Indian population, resulting in increased incidence of cardiovascular diseases and diabetes, and decrease in the age of onset of these diseases. This study was carried out to determine if individuals who consider themselves healthy have latent health problems or risk factors associated with these diseases.

**Methodology:** Basal parameters, protein creatinine ratio (PCR), and blood glucose levels were measured in normal male volunteers (120) of different age groups: Children (33), Young Adults (32), Middle Aged (34), and Old Adults (21).

**Results:** Body Mass Index (BMI) was <18 in 7 males (all Children), BMI was > 24 in 38 (31.6%). PCR >0.2 was observed in 34 (28.3%) males. 42 (35%) people were pre-hypertensive while 46 (38.3%) were hypertensive. Random blood glucose was higher than 140 mg/dL in 13 (10.8%) males.

**Conclusion:** There is an urgent need to increase health awareness in general population through news reports and advertisements etc. Regular health check-ups should be encouraged in educational institutes.

**Author for Correspondence:** Prof. Manoj Kumar, Head, Department of Physiology, TMMC & RC, TMU, Moradabad, Email: premmanoj2001@yahoo.co.in

## **Comparative study of pulmonary functions in yoga performing group and non -yogics (sedentary population)**

**Abidafarheen, Gousuddin Arif, B.S Malipatil**

P6

Department of Physiology, M.R Medical College, Gulbarga.

**Background:** A 3,000 year old tradition, yoga, is now regarded in the Western world as a holistic approach to health. Regular practice of yoga improves pulmonary functions.

**Objectives:** The present study was carried out to assess beneficial effects of long term (>1 yr) regular yoga practices on pulmonary functions, BMI & body fat percentage.

**Methods:** Sixty three (n=63) healthy male & female volunteers 30–70 years and consisting of thirty three (33) yogic subject performing yoga and thirty (30) non yogics (sedentary group) participated in the study. Participants practiced yoga under supervision of professional yoga instructor, two hours daily seven days a week. Standing height, weight and dynamic lung function tests viz. Forced Vital Capacity (FVC), Forced Expiratory Volume in 1st second (FEV1), FEV1/FVC ratio, Peak expiratory flow (PEFR) were measured in individuals performing yoga for >1 yr and sedentary population using SPIROMETER-SPIROLAB 111.

**Results:** The result revealed that long term (>1yr) yoga training resulted in a significant increase in FEV1 ( $p < 0.05$ ) FEV1/FVC ratio ( $p < 0.05$ ) PEFR ( $p < 0.05$ ).

**Conclusions:** Long term regular yoga practice improves pulmonary functions.

**Key words:** yoga, pulmonary function tests, FVC, FEV1, FEV1/FVC, PEFR, BMI, Body fat percentage

**Corresponding address:** Dr .Abidafarheen, Department of Physiology, M.R Medical College, Gulbarga, E-mail: abida\_farheen36@yahoo.com

## **Audit of text book information about pacemaker mechanisms, with special reference to $I_f$ and $I_{NCX}$ .**

P7

**Abirami.V, Sathya Subramani**

**Background:** Current debate on the fundamentals of pacemaker mechanism of heart revolves around two ionic currents,  $I_f$  and  $I_{NCX}$ .  $I_f$  (funny current) is a hyperpolarisation activated depolarising current that plays a vital role in pacemaker mechanism. Recent data suggests a significant role for  $I_{NCX}$  (sodium calcium exchanger current) as a pacemaker current. Studies from our laboratory also show that  $I_{NCX}$  is mandatory for pacemaker activity. In view of this we undertook to review textbook information on pacemaker mechanisms and hence this poster.

**Aims:** To catalogue information on pacemaker mechanism from various Physiology text books used by medical students and faculty in our institution

**Objective:** To assess specifically whether the text books chosen for the audit mention  $I_f$  and  $I_{NCX}$  in pacemaker mechanisms

**Methods:** 12 Physiology textbooks were chosen based on popular usage by medical students in our institution. Information on pacemaker currents (with special reference to  $I_f$  and  $I_{NCX}$  currents) was entered into a table.

**Results:** 50% of the textbooks listed in the table mention the role of  $I_f$ . Only 17% of text books mention about  $I_{NCX}$ , which is now evolving as an important pacemaker current.

**Conclusions:** Majority of Physiology textbooks do not describe the major pacemaker mechanisms in heart.

## Study on auditory reaction time in alcohol dependent patients

P8

Aditi Sood\*, Pushpa Pazare\*, Kranti Kadam\*\*, Shubhangi Parkar\*\*

\*Department of Physiology and \*\*Department Of Psychiatry; Seth G. S. Medical College and KEM Hospital

**Background:** It's a known fact that alcohol affects the reaction time as well as cochlear function by damaging the hair cells of cochlea.

**Aim & Objective:** The aim of this study is to compare whether alcohol dependence affects the auditory reaction time for high pitch and low pitch sound equally or not. This is done by comparing the two reaction time in Alcohol Dependent Patients.

**Methods:** The sample population includes 25 male subjects aged 25 – 50 years who had been diagnosed with Alcohol Dependence according to DSM – IV TR and admitted for treatment in de-addiction ward in KEM Hospital. Three readings of Auditory reaction time was measured for high pitch and low pitch sound separately by using Human Reaction Time Apparatus and best of three readings has been taken. ANOVA test of variance has been used for statistical analysis.

**Results:** Auditory reaction time for both high pitch and low pitch sounds are increased in Alcohol Dependent patients as compared to normal. However as compared to reaction time for low pitch sound, the reaction time for high pitch sound is highly deranged.

**Conclusion:** This study concludes that Alcohol Dependence affects the reaction time for high pitch sound more than that of low pitch sound

**Corresponding author :** Dr. Aditi Sood, A-101, Krishna Paradise, Khandelwal Layout, Evershine Nagar, Malad (west), Mumbai – 400064. Email – dr.aditisoos@gmail.com

## A study of $VO_{2max}$ in relation with body mass index during tread mill exercise in healthy young adult young men.

P9

Aditya Ghosh and Wasima Jahan

Post Graduate Trainee, Physiology, Assam Medical College & Hospital, Dibrugarh

**Objective:** To compare the  $VO_{2max}$  during the tread mill exercise in healthy young adult in relation to their BMI.

**Method:** 50 healthy young students of age group of 18-25yrs were selected from different semester of the college. They were grouped according to their BMI into 4 groups; BMI 18.5-22.9 include 12 subjects, BMI 23-24.9 include 14 subjects, BMI 25-29.9 include 11 subjects, BMI  $\geq$  30 include 13 subjects. The subjects were then asked to perform exercise on tread mill for 9mins, under Bruce protocol, the speed and the inclination change in every 3mins interval, the heart rate was calculated in every stages of exercise and the  $VO_{2max}$  was calculated with help of Ardele equation;  $VO_{2max} = 111.33 - (0.42 \times \text{HR in bpm})$

**Results:** The mean and  $\pm$ SD of BMI and  $VO_{2max}$  of each group was calculated. The Pearson correlation also calculated (r value -0.50873) which shows a negative correlation, with increase in BMI there is decrease in  $VO_{2max}$ .

**Conclusion:** The  $VO_{2max}$  which is a index of cardiorespiratory fitness of an individual decreases with increase in BMI, this indicates that obesity which is cause of increase in BMI compromises the cardiorespiratory fitness of the individual & limit their exercising capacity.

**Presenting author:** Name: Dr. Aditya Ghosh, Department of Physiology, Assam Medical College and Hospital, Barbari, Dibrugarh, Assam, PO- AMC, PIN- 786002; Email: dtghosh1@gmail.com

## Acute effects of chewing tobacco on heart rate variability (HRV) in healthy young adults.

Afreen Begum H Itagi, Nagaraja S, Suresh Y Bondade

Dept. of physiology, JJM Medical College, Davanagere

P10

**Objectives:** Despite the antiquity and popularity of chewing tobacco in India, its effects have not been investigated systematically in humans. The aim of this study was to investigate acute effects of chewing tobacco on heart rate variability among healthy young adults.

**Methods:** A total of 30 young adult males were included in the study. Each individual was asked to chew tobacco and subjected to HRV analysis. The HRV parameters were measured before and at 5, 30 and 60 min after starting of chewing tobacco. Repeated measures ANOVA and paired *t*-test was used to assess changes over time.

**Results:** There was a significant increase in heart rate during tobacco chewing. Mean heart rate at baseline measured  $79.2 \pm 11.3$  bpm. There was a rise in mean heart rate to  $87.5 \pm 15.4$  bpm at 5min during tobacco chewing and gradual reduction to baseline observed after 30min followed by no significant change till 60 min. The normalized Low-frequency power (LFP) and low/high frequency power ratio were elevated after 5 min; however, normalized high-frequency power was reduced after 5 min tobacco chewing.

**Conclusions:** Present study detects a transient enhancing sympathetic activity during tobacco chewing followed by gradual decrease in parasympathetic response among healthy young adults.

**Corresponding address:** Dr. Afreen Begum H Itagi (M.D. physiology), Dept. of physiology, JJM Medical College, Davanagere -577004 (Karnataka), E-mail: afreen.itagi@gmail.com

## Geriatric socio-demographic status: a major potential barrier among the geriatric health care seekers to the built environments of health care providers in the rural sector of Tripura.

Aghore Debbarma\* and Nabagata Roy

Department of Physiology, Agartala Government Medical College, Tripura. Fax No. 03812356701, Email: aghoredebbarma@yahoo.com

P11

**Aims and Objectives:** The aged patients seem to be confronted with barriers when using health services. As to the potential pitfalls that may exist, there is a need to explore the different factors in the creation of the barriers. A barrier, as it is used in this paper, restricts the use of health services. The aims and objective of the study is to assess the potential barriers and the factors that may restrict the geriatric people from using health services.

**Methodology:** Hospital based cross sectional study was taken up among geriatric patients of both sexes in rural sector of Tripura, through the designed questionnaires. Survey of 100 geriatric patients was done during the period of July and August'12. Mentally and physically fair, geriatric patients of both sexes above the age of 65 years, attending at Kumarghat hospital and Ananda Nagar primary health center, located at the remote of north and west Tripura respectively, were investigated, on consent.

**Result and observations:** Most of the respondents were found to be between the ages 74-78 years. 50% of geriatric had no formal education and earning methods (71%). 88% of geriatric receive good and caring behavior from their family, while 7% were found to receive disruptive behavior from their family. 23% individuals have a good health status who attended the hospital for general check-ups and about 77% were found to be ill and 33% of them could not afford to spend for their treatment. About 91% individuals do not have any family doctors. Positive impacts were observed in regard to the family doctor, knowledge about the institutional services ( $P=0.000$  and  $0.001$  respectively). Literacy has some positive impact on health status ( $P=0.025$  and helpful attitude of family members ( $P=0.019$ ) also found to be significant.



**Conclusion:** The “elderly age” has itself acted as a barrier. Low education (50%) level also acts as a barrier. Such can expose the elderly people as the most vulnerable and less knowledgeable ones, thus leading to low access to health care and use of preventive care. The study did not show negative perception in regards to family and social support. Clearly family support is advantageous as their needs may be differently expressed. Lower socioeconomic status (71%) acted as a barrier and has a disadvantageous effect on the patient's perceptions towards the use of services provided. The general emphasis is that the greatest need for support is in the last few years of a person's life.

## The Effect of Body Mass Index and Gender on Audio Visual Reaction Time In Young Adults

Aiesha Durrebar Younus Khan, A.Ashwini

Department of Physiology, M.R. Medical College, Gulbarga

P12

**Objectives:** Reaction time is defined as an interval of time between the application of stimulus and the initiation of appropriate voluntary response as the subject has been instructed to respond as quickly as possible. Reaction time is found to be altered by a number of physiological and pharmacological factors. In this study the effect of Body Mass Index (BMI) and gender on the Visual (VRT) and Auditory reaction time (ART) was studied.

**Methods:** Visual and auditory reaction times (VRT and ART) were studied in 122 healthy medical students in the age group of 17-22 years, among them 38 were male and 41 were female. Subjects were presented with two visual stimuli viz red and green light stimuli and two auditory stimuli viz tone and click sound stimuli. Data was analyzed using one – way ANOVA and Karl Pearson co efficient co relation analysis.

**Results And Conclusions:** Males had higher BMI than females. It was found that females had a significantly longer visual reaction time for red light than compared to males. Also females had longer auditory reaction time than males but it was not statistically significant. It was also observed that in both males and females visual reaction time was longer than auditory reaction time.

**Corresponding address:** Dr.Aiesha Durrebar Younus Khan, Department of Physiology, M.R. Medical college, Gulbarga, Email: durrebaryounus@yahoo.com

## Role of vascular endothelial growth factor inhibitor with and without steroid on, visual acuity, intraocular pressure and central macular thickness, in type 2 diabetes mellitus.An interventional case series.

<sup>1</sup>Ajay Ambade, <sup>2</sup>Rakhee Ambade, <sup>3</sup>Sunil Gupta, <sup>4</sup> Mohan Sagdeo.

<sup>1</sup>Ambade Eye Hospital, Kamala Towers, Indora Sq. Nagpur-17; <sup>2</sup> Associate Professor , Department of physiology, NKP Salve institute of medical science and research centre. Nagpur; <sup>3</sup>Dibetes n’Care research Centre. Lendra Park, Ramdaspath Nagpur;

<sup>4</sup>Professor, Department of physiology, NKP Salve institute of medical science and research centre. Nagpur

P13

**Background:** Pathophysiology of Diabetic macular edema has multi- factorial origin. Increase in retinal capillary permeability and subsequent retinal edema may be the result of breakdown of the blood retinal barrier mediated by VEGF (Vascular endothelial growth factor). Many studies are currently evaluating the role of antiVEGF agents associated with neovascularization in Dibetic retinopathy. Corticosteroids are also known to reduced vascular permeability and down regulate VEGF. Hence summative effect can be promising

**Aims and Objectives:** The purpose of this study to evaluate the visual prognosis and anatomical alteration after giving intravitreal injection of Triamcinolone Acetonide(steroid) and Bevacizumab (Anti VEGF)in comparison with only Bevacizumab treatment separately in diabetic retinopathy.

**Methods:** Prospective, Randomized, comparative interventional case series of 98 eyes of 81 subjects. After doing base line investigations viz visual acuity (VA), IOP and Central subfield Macular thickness (CMT) Intravitreal Injections of Bevacizumab with and without Triamcinolone are injected separately under topical anaesthesia in Diabetic eye. The same investigations are repeated at 3 and 6 month interval and compared with base line and inter group. ANOVA was performed to evaluate the statistical significance with time in each group. Assumption of sphericity was evaluated by GREENHOUSE-GEISSER or HUYNH-FELDT corrections. Upon significant post HOC analysis carried out by BONFERRONI corrections.

**Results:** Visual Acuity improved and CMT decreases significantly at 3<sup>rd</sup> and 6<sup>th</sup> month in comparison with base line in both groups but intergroup difference failed to reach significance at the end of 6<sup>th</sup> month (p=0.341; p=0.204) though the percentage reduction of CMT at 3<sup>rd</sup> month is more in combine group (25.73% vs 34.81%). Also the VA which shows statistical significance at the base line in inter group, was insignificant at the 6<sup>th</sup> month with upper hand for combine group. Analysis also revealed nonsignificant rise in IOP in Bevacizumab group while significant increase in combine group. Inter group comparison at the end of 6<sup>th</sup> month shows significant rise of IOP in combine group. (p=0.00003).

### Study of Peak Expiratory Flow Rate [PEFR] in the residents surrounding puffed rice industries

Ajay K T<sup>1</sup>, Ranajit B Naik<sup>2</sup>, Suresh Y Bondade<sup>3</sup> and Balu P S<sup>4</sup>

P14

**Introduction:** Industrial pollution has been and continues to be a major factor causing the degradation of the environment around us, Puffed rice is produced in cluster of small units. Fuels used in the ovens for Puffed Rice making are mainly rice husk, wood, wood shavings, used automobile tyre, groundnut shell, and agricultural residues. Burning these generates high levels of particulate matter, carbon monoxide and other pollutants.

**Objectives:** To compare PEFR in residents with in a range of 100mts from puffed rice industries with those residing more than 300mts away.

**Methods:** A total of 60 healthy adult subjects (30 residing with in a range of 100mts of the cluster units and 30 residing more than 300mts) were selected randomly among the general population surrounding puffed rice industries. PEFR was recorded. The duration of the stay in the area and the distance of the stay from the puffed rice industries is also considered. Results were assessed and analyzed.

**Results:** The result showed a significant decrease in PEFR in residents with in a range of 100mts than the people who are residing 300mts away from the clusters. It has also shown that, the PEFR decreases more with increase of their stay in that area.

**Conclusion:** Smoke of the Puffed rice industries causes inflammation and narrowing of airways which results in increase in resistance to airflow and a decrease in elastic recoil pressure of the lungs. Health education on hazards of pollutants and also about the safety measures to be taken by the residents should be done.

**Key Words:** PEFR; Puffed rice industries

## A Pilot Study on Sympathovagal Balance in Patients with Hydrocephalus

P15

Akhil Deepika K\*, Arun Babu R\*, Sathyaprabha T N#, Dhaval P Shukla\*, Indira Devi B\*

\* Department of Neurosurgery and # Department of Neurophysiology. National Institute of Mental Health And NeuroSciences, Bangalore

**Background:** Cushing described the Cushing's reflex in 1902 as the vasopressor response to increased intracranial pressure. This reflex was defined or elicited in patients who were terminally ill. In this study we attempted to find the sympathovagal balance and subclinical autonomic dysfunction in patients with hydrocephalus who were admitted for ventriculoperitoneal (VP) shunt.

**Methodology:** Patients with hydrocephalus who were admitted in the department of neurosurgery for VP shunt were recruited in the study. BioHarness™ (Zephyr technologies) a non-invasive telemetric device was used to procure the Lead II ECG. A 5 minute artifact free segment from the recording was analysed with the LabChart© software. Intracranial pressure (ICP) was measured intraoperatively, at the time of insertion of ventricular end of VP shunt. Statistical analysis was done to find the correlation between the ICP and sympathovagal balance.

**Results:** A total of 15 patients were recruited. The age range was 18 to 52 years. There were 6 males and 9 females. The mean ICP was  $20.73 \pm 6.73$  mmHg. The ratio of Low Frequency to High Frequency (LF/HF) which denotes the sympathovagal balance ranged from 0.31 to 2.44. The Spearman's correlation coefficient between ICP and LF/HF was 0.281 ( $p=0.381$ ).

**Conclusion:** There was no significant correlation between ICP and Heart rate variability parameters in patients with hydrocephalus.

## Molecular basis of Alzheimer's disease and latest treatment strategies

P16

Ambika Jawalkar

PG in MD Physiology, Department of Physiology, Sri Venkateswara Medical College, TIRUPATI.

Alzheimer's disease (AD), the most common cause of dementia in elderly, is a progressive and fatal neurodegenerative disorder characterized pathologically by atrophy of the cerebral cortex and hippocampus, with intraneuronal neurofibrillary tangles containing abnormally phosphorylated *tau* protein, extracellular amyloid plaques, and neuronal cell death, and clinically by gradual impairment of memory. The patient gradually becomes progressively impaired in both cognitive and functional capacities. The loss of intellectual abilities is of sufficient severity to interfere with social and occupational functioning. The plaques are deposited outside the neurons and are composed of a small protein called amyloid beta (A-beta). The tangles are found inside neurons, and their branching axons and dendrites. They are made up of filaments of proteins called *tau*. The plaques and tangles are responsible for the degeneration of the neurons. Amyloid-beta triggers the disruption and death of the neurons.

This hypothesis has led to the efforts of developing drugs to inhibit the production of A-beta and *tau*, and thus stop the harmful effects of these on the neurons. Knowledge of the molecular basis and genetics of AD is helpful to understand the latest treatment strategies of the disease like Inhibition of A $\beta$  production, Enhancement of A $\beta$  clearance and A $\beta$  degradation, RNA interference, NGF therapy, immunotherapy etc., apart from the approved therapies using cholinesterase inhibitors and NMDA receptor modulation.

Medical fraternity is eagerly looking forward for a breakthrough in the research to provide a drug that could effectively slow or stop the gradual loss of neurons in the brain, and ultimately to stop the progression of the disease.

**Corresponding** Fax No. 03812356701, Email: aghoredebbarma@yahoo.com: Ambika Jawalkar, PG in MD Physiology, Department of Physiology, Sri Venkateswara Medical College, TIRUPATI. Contact No: 9705557821 Email id: drjnambika@gmail.com

## **Correlation of Erythrocyte and Platelet Parameters in Iron Deficiency Anemia.**

**Amrish Kalaskar, Suresh. Y. Bondade**

P17

Department of Physiology, J. J. M. Medical College, Davangere, Karnataka.

**Objectives:** In iron deficiency anemia (IDA), several changes in platelets have been reported. Therefore, a relationship between erythrocyte and platelet parameters should be considered. The aim of this study was to evaluate the correlation of erythrocyte and platelet parameters in adults with IDA.

**Methods:** Thirty women of mean age 35 +/- 15 (20-50) years with IDA were enrolled in this study. The relationship between serum erythrocyte parameters such as erythrocyte count, hemoglobin concentration, mean corpuscular volume (MCV), mean corpuscular hemoglobin concentration (MCHC) and platelet parameters such as platelet count (PLT), platelet distribution width (PDW), mean platelet volume (MPV) were evaluated.

**Results:** A mild thrombocytosis in 26.6% patients and thrombocytopenia in 6.6% patients were noted. Platelet counts were increased when there was a decrease in mean platelet volume (MPV). There was an inverse relationship between PLT and MPV ( $p < 0.001$ ). Also there was a linear relationship between PDW and MPV ( $p < 0.001$ ) and an inverse correlation between PDW and MCV ( $p < 0.001$ ). MPV is inversely correlated with MCHC ( $p < 0.001$ ).

**Conclusions:** PLT was inversely related to hemoglobin levels. These changes in the platelet parameters may be related to low levels of hemoglobin.

**Corresponding address:** Dr Amrish, Department of Physiology, J. J. M. Medical College, Davangere, Karnataka. Email: dr.amrish@live.com

## **Correlation of anthropometric parameters with Peak Expiratory Flow Rate**

**Amruta Bawaskar, Neela Iyer**

P18

**Aims & Objectives:** To know correlation between PEFr and height, weight & BMI in males and females and determining which factor has a stronger association with PEFr.

**Method:** The study has been carried out on 150 healthy females & males of 18 to 25 years of age. Informed consent taken, Their PEFr is measured with the help of mini Wrights Peak Flow Meter. Three PEFr readings were taken from each individual and the best of the three readings was considered. Subjects were categorized into groups based on their differences in height, weight and BMI. The variations of PEFr with respect to height, weight and BMI were determined separately. Unpaired t-test was used for analysis.

**Results:** The values of PEFr obtained in this study were within the normal range. The mean values of height, weight, BMI and PEFr were higher for males than females. There is also positive anthropometric association with PEFr.

**Conclusion:** It is concluded that PEFr shows positive correlation with anthropometric determinants like height, weight and BMI.

**Corresponding Address:** Dr. Amruta Bawaskar, Department Of Physiology, 3 rd floor college building, L.T.M.M.C. & G.H, Sion, MUMBAI.400022. Maharashtra.

Email Id :mamrutak@gmail.com.

### **Effect of height and BMI on nerve conduction velocity**

P19

**Amruta S Bennial, Manjunath H, R H Taklikarand Vijayanath Itagi**

Department of Physiology, Navodaya Medical College, Raichur Karnataka India.

**Objective:** To know the effect of height and Body Mass Index (BMI) on median motor nerve conduction velocity in younger age group.

**Materials and Methods:** A Cross – Sectional study was conducted in 50 female medical students with mean age 19 to 22 years. Nerve conduction velocity was calculated by recording evoked electromyogram (EMG) by stimulating median nerve at elbow and at wrist with the help of EMG electrodes and isolated stimulator by using Power lab 8/30 series with dual Bioamplifier. Statistical analysis was done by using Karl Pearson Correlation coefficient.

**Results:** There is moderately negative correlation effect with height on motor nerve conduction velocity with “r” value -0.23487 and also slight negative correlation effect of BMI on conduction velocity with “r” value -0.1832.

**Conclusion:** With increasing height and BMI, nerve conduction velocity is decreased. Therefore this phenomenon should be considered for comparative studies and diagnosing pathological conditions.

**Corresponding address:**Dr. Amruta S Bennial; Assistant professor in Physiology; Navodaya Medical College, Raichur. Phone no -9448433789; Email addresses- amrutabennial@gmail.com

### **Playing games during a lecture hour: experience with an online blood grouping game**

**Anand Bhaskar**

P20

**Aims:** To engage the students in an online blood grouping game during lecture on blood grouping.

**Objective:** To assess the effectiveness of such an activity by taking feedback from the students using a questionnaire.

#### **Materials and Methods:**

Online blood grouping game available in the Nobel Prize website was used (<http://www.nobelprize.org/educational/medicine/bloodtypinggame/>). After a lecture on blood grouping, the first MBBS students were given the opportunity to play the game. The activity consisted of blood grouping followed by transfusion of appropriate blood to a virtual patient. Few students volunteered to play the game. The spectators also helped the volunteers in doing the blood grouping and transfusion correctly.

**Results:** 97% (n=95) of the students felt that the game helped in understanding the basics of blood grouping. 94% felt that it improved their understanding of blood grouping. For 91%, the game helped in reviewing their knowledge on blood grouping. 98% recommended this activity for future batches. 99% wanted such activities for other topics. For 91%, this activity was a relief during the lecture. 99% felt it was fun.

**Conclusions:** Activities like games can break the monotony of didactic lectures. Such activities are interesting for the students and can grab their attention during lecture.

**Corresponding address:** Dr. Anand Bhaskar MD, Assistant Professor, Department of Physiology, Christian Medical College, Bagayam, Vellore – 632 002, Tamilnadu, India, Fax: +914162262788, Phone: +914162284268, Mobile: +919489330600, E-mail: anandbhaskar@cmcvellore.ac.in, dranandbhaskar@gmail.com

## **Assessment of diabetic autonomic neuropathy by heart rate variability analysis and Ankle-Brachial Index**

P21

**Anbarasi M, Rajendran P and Rajkumar G**

**Aims and Objectives:** To assess autonomic neuropathy in type II diabetic patients by heart rate variability (HRV) analysis and ankle-brachial index (ABI)

**Methods:** 45 type II diabetic patients (Age - 40 – 60 yrs; males - 21; females - 24) are recruited in this cross-sectional study. Based on the duration of diabetes since diagnosed, the patients are divided into 3 groups, group I (duration  $\leq$  5 yrs; n=26), group II (duration 5 – 10 yrs; n=9) and group III (duration  $\geq$  10 yrs; n=10). The subjects were investigated for their glycemic index and fasting lipid profile. Ankle-brachial index and short-term resting HRV was done in all patients. All the data were analysed using SPSS statistical software 16.0.

**Results And Conclusions:** On analysing the HRV data, the pNN50 and total power were found to be significantly decreased as the duration of diabetes increases ( $p < 0.05$ ). Also, there is increase in ankle-brachial index from group I to group III. This concludes that, in spite of the absence of neuropathic symptoms, periodic assessment using non-invasive HRV analysis and ABI is recommended to assess autonomic neuropathy in diabetic patients.

**Corresponding address:** Dr. M. Anbarasi, M.D, Assistant professor of Physiology, Chennai Medical College Hospital & Research Center, Irungalur, Tichy – 621 105. Phone: 0431-3058668, Mobile: +91 97905 42244, Email: anbarasi.physio@gmail.com, dr\_anbarasi@yahoo.co.in

## **Role of Vitamin D Supplementation in Elderly Subjects with Cognitive Impairment**

**Anil Kumar Gangwar\*, Sunita Tiwari\*, S.C. Tiwari\*\*, Anita Rawat\* Pradeep Kumar\***

P22

\*Department of Physiology, KGMU; \*\*Department of Geriatric Mental Health, KGMU

**Introduction:** Psychological wellbeing is an important aspect of health. Elderly persons have various psychological problems like cognitive decline, depression, sleeplessness etc. This may be attributed to deficiency of vitamins and minerals especially vitamin D. Thus, based on the neurosteroid properties of vitamin D, it can be hypothesized that the correction of hypo vitaminosis D may prevent age related decline in cognitive functions.

**Aims and Objective:** To see the effect of Vitamin D supplementation on cognitive performance in subjects of cognitive impairment.

**Material and Method:** The study was conducted on 80 subjects they were divided into two groups, Group A (case) and Group B (control), each group having 40 subjects. Intervention (vitamin D) was done in Group A (case). Cognitive testing was done by MMSE score. Clinical evaluation and base line measurements [serum vitamin D, calorie assessment and nutritional assessment (total serum protein, serum albumin and BMI)] were done.

**Result:** After 3 months of intervention, the mean MMSE score improved (6.7% higher) significantly ( $p < 0.05$ ) in Group A as compared to Group B. Further, after 6 months, MMSE score improved (8% higher) significantly ( $p < 0.001$ ) in Group A as compared to Group B.

**Conclusion:** Vitamin D<sub>3</sub> supplementation has an additive effect on the cognitive functions in elderly, who are on medical therapy for senile dementia.

**Corresponding address:** Dr. Anil Kumar Gangwar (JR III), Department of Physiology, King George's Medical University, Lucknow, U.P.

*Email address:* anil\_kgmu@rediffmail.com

### **Perceived stress and academic performance: a cross-sectional study among undergraduate engineering students**

P23

**Anindita Mahanta**

Department of Physiology, Gauhati Medical College, Narakasur Hill-top, Guwahati, Assam,

**Aims:** Students, particularly in professional courses, are exposed to different types of stress stimuli, which may affect their academic performance.

**Objectives:** 1. To assess perceived stress and sources of stress, 2. To determine the relation between perceived stress and academic performance.

**Methods:** The study was carried out among 88 final-year engineering students of Regional Institute of Science and Technology, Meghalaya. Perceived stress was measured using Perceived Stress Scale (PSS-14). A 34-item questionnaire was used to determine sources of stress. Academic performance was assessed from students self-reported examination score.

**Results:** Overall mean perceived stress was 18.18±6.32. Mean stress levels were higher among females (20.27±7.18) compared to males (18.32±6.74). The most common stressors were Expectation after graduation (60%), Performance in Examination (48%), Class attendance (47%), increased class workload (42%) and Quality of food in mess (40%). A negative correlation ( $r=-0.482$ ) was found between perceived stress and academic performance.

**Conclusions:** Identification of the sources of stress helps to reduce their negative impact on students and fosters a healthy academic environment. A follow-up study will enable further evaluation of the determinants of stress and their impact on academic performance.

**Corresponding address:** Dr. Anindita Mahanta, Demonstrator, Department of Physiology, Gauhati Medical College, Narakasur Hill-top, Guwahati, Assam. Pincode: 781032, Contact no.: 09706064757, E-mail: draninditamahanta@gmail.com

### **Relationship between physical activity and obesity among urban school-aged adolescents in Davangere.**

P24

**Anisha, S. Chandrasekharappa, Suresh Y Bondade**

Dept. of physiology, JJM Medical College, Davanagere

**Objectives:** The objective of the present study is to assess the relationship between physical activity and obesity among adolescents aged 13-17 years old from Davangere.

**Design:** Cross sectional study.

**Methods:** Overweight and obesity were defined according to age and sex specific BMI cut-points. A total of 150 school students aged 13-17 years underwent anthropometric measures of height and weight and provided self-reported measures of physical activities.

**Results:** 14% of 13-17 years adolescents were overweight and 5% were obese. The prevalence rates were greater in girls than boys ( $P<0.001$ ) and tended to increase with age ( $P<0.05$ ). The normal weight boys were significantly more active ( $P<0.01$ ) than obese peers. The physical activity levels were lower ( $P<0.05$ ) and television viewing times were higher ( $P<0.01$ ) in overweight and obese boys and girls than normal weight adolescents.

**Conclusions:** Present study shows physical activity has beneficiary effect in reducing overweight/obesity among adolescents.

**Corresponding address:** Dr. Anisha(M.D. physiology), Dept. of physiology,JJM Medical College, Davanagere -577004 (Karnataka) E-mail: anishahegdekar@gmail.com

### Verbal fluency deficits in patients with Parkinson disease.

P25

Anita Pal, Madhuri Behari# and Ratna Sharma\*

Department of Physiology, AIIMS, New Delhi, # Department of Neurology

**Aims:** This study compares the performance of Parkinson's disease patients with or without dementia on semantic verbal fluency tests.

**Objectives:** To assess the semantic memory (verbal fluency) in the patients of Parkinson disease with or without dementia.

**Methods:** Forty four patients with PD matched for mean age, years of education, onset of disease and duration of the disease participated in this study. Mini mental state examination (MMSE) scale was used to classify PD patients as PD without dementia (PDND, n = 23) and PD with dementia (PDD, n=22). Patients with MMSE score <24 were considered as PD demented and with MMSE score >24 as PD non-demented. Clinical dementia rating (CDR) was used to assess the degree of severity of dementia in both the groups, to evaluate verbal fluency, naming test was performed thrice, for duration of 30 sec each. Verbal fluency, MMSE and CDR scores were compared between the groups.

**Results:** PDD patients scored significantly lower than PDND in MMSE (Unpaired t test  $P< 0.0001$ ) and verbal fluency (two-sample Wilcoxon rank-sum (Mann-Whitney) test). CDR scores were higher in PDD patients as compared to PDND.

**Conclusions:** These results indicate that the two groups of Parkinson's patient differ in their cognitive abilities. Further PDD patients are deficits in semantic memory as revealed by their lower performance on verbal fluency task.

**Keywords:** Parkinson's disease, Dementia, Semantic memory, MMSE, CDR.

**Corresponding address:** Prof Ratna Sharma, Stress and Cognitive Electroimaging Lab, Department of Physiology, AIIMS, New Delhi, Ph: 011 26504682, Email: ratnaaiims@gmail.com



## Comparison of Cardiovascular Reactivity to Stressors in Indian Young Adults

P26

Anjali Verma<sup>1</sup>, Manoj Kumar<sup>2</sup>, Indu Saxena<sup>3</sup>

1: Demonstrator, 2: Professor; Department of Physiology, TMMC & RC, TeerthankerMahaveer University, Moradabad, Uttar Pradesh, 244001

3: Assistant Professor; Department of Biochemistry, AIIMS Jodhpur, Rajasthan

2: Corresponding author, premmanoj2001@yahoo.co.in

**Backgrounds and Objectives:** Cardiovascular reactivity (CVR) is the increase in heart-rate and blood pressure in response to stressors. Different stressors have been used to monitor the CVR in various studies. In this study, we have compared the CVR to three different stressors (cold pressor task, hand grip test, and video game) to determine the best suited stressor for any particular study design.

**Materials and Methods:** 82 (38 Female) young Indian adults with normal basal parameters and normotensive parents were selected for the study. Each subject was exposed to three stressors: cold pressor task (CPT), hand grip test (HGT), and video game (VG). The CVR to the three stressors was compared within female subjects and within male subjects by ANOVA, and between male and female subjects by unpaired Student's t-test.

**Results:** CVR to CPT was significantly different in male & female subjects but highest CVR was obtained to HGT. Video game was not able to generate significant change in heart rate and blood pressure.

**Conclusion:** If the purpose of research is to study the gender difference in CVR then CPT is a more appropriate stressor but HGT is more appropriate if maximum CVR is to be generated.

## Effect of isometric contraction using handgrip dynamometer on heart rate variability in normal individuals.

P27

Anjum Datta\*, R.S. Inamdar, Sunaina Soni, Yashoda Kattimani

**AIM:** To study the effect of isometric contraction using handgrip dynamometer on Heart Rate Variability in normal individuals, both males and females.

**OBJECTIVES:** (1) To record and compare pre (at rest) and post 30 % maximal voluntary contraction; Pulse rate, blood pressure, Heart Rate Variability parameters; (2) To examine the association of Heart Rate Variability spectral component with isometric contraction.

**METHODS:** 60 normal healthy subjects (30 boys and 30 girls, age range- 18 to 25 years) participated in the study. Pulse rate, Blood Pressure and Heart Rate Variability (for 5 mins) were recorded at rest. Then 30 % Maximal Voluntary Contraction for 3 minutes was performed by the subjects. Then immediately after 3 minutes of 30 % Maximal Voluntary Contraction Pulse rate, Blood Pressure and Heart Rate Variability (for 5 mins) were recorded.

**RESULTS:** Observations were analysed using Paired 't test'. After 30 % Maximal Voluntary Contraction for 3 minutes statistically significant rise was found in pulse rate ( $p < 0.001$ ), systolic blood pressure ( $p < 0.001$ ), diastolic blood pressure ( $p < 0.001$ ), pulse pressure ( $p < 0.05$ ) and mean arterial pressure ( $p < 0.001$ ). Heart Rate Variability parameters, Low Frequency (LF) increased, High Frequency (HF) decreased and LF/HF ratio increased but these results were not statistically significant after 30 % Maximal Voluntary Contraction for 3 minutes.

**CONCLUSION:** This study suggests that after sustained isometric handgrip contraction at 30% MVC for 3 minutes sympatho/vagal balance shifted towards sympathetic dominance. Isometric exercise provides a convenient and easy way to activate the cardiovascular system and define the role of Autonomic nervous system in exercise

response. Isometric handgrip test is one of the most common autonomic function test used. During rehabilitation Isometric exercises should be used cautiously in patients suffering from cardiovascular diseases as it can evoke a significant sympathetic response which can be dangerous.

**Corresponding address:** Dr. Anjum Datta (P.T.), MGM Institute Of Health Sciences, Department Of Physiology, Kamothe, Navi Mumbai-410209, Maharashtra; Correspondence Address- 1/62 Sunder Vihar, Near Paschim Vihar., New Delhi- 110087 E-mail id- decent\_anjum\_datta@yahoo.co.in

## **Assessment of cardiac function during immersion of face in water in humans.**

P28

**Anjusha I B, Subba Rao, Padmakumar R**

Department of Physiology, BGS Global Institute of Medical Sciences, Bangalore

**Aims:** TO study the cardiac response to breath hold face immersion in water by echocardiography.

**Objectives:**To observe the changes in the following parameters during breath-hold face immersion in water; (1) Heart rate by using Electrocardiograph; (2) Left ventricular End diastolic volume (3) Left ventricular End systolic volume (Using Echocardiograph); (4) Left ventricular Stroke volume; (5) Left ventricular Cardiac output (6) Left ventricular ejection fraction (derived values from the above)

**Methods:** Study sample: The subjects chosen for this study were experienced active breath hold swimmers of age group 20 to 35 years, who can communicate in English. They were members of Manipal Institute of Technology swimming pool, who were NOT students of any of the Institutions of Manipal University.; Sample size : 15 ; Study site : Cardiology Department of Kasturba Medical College, Manipal.

**Results:** After analysis of the data for the 15 subjects, the following changes were observed during 'breath-hold face immersion in water' when compared to those of basal condition. (1) There is a statistically significant reduction in heart rate. (2) There is a statistically significant increase in Left Ventricular End Diastolic Volume as well as Left Ventricular End Systolic Volume. (3) Even though there is an increase in the calculated Left Ventricular Stroke Volume & a decrease in the calculated Left Ventricular Cardiac Output, they were found to be of NO statistical significance. (4) The Left Ventricular Ejection fraction showed a statistically significant reduction.

**Conclusions:** In conclusion, while bradycardia is a common feature observed in both actual diving and breath hold face immersion in water; the significant increase observed in the left ventricular end diastolic volume in the present study, differs with some of the previous observations of actual diving. So it may be difficult to extrapolate the results of this study to those of actual diving. However more studies comparing the changes between the actual diving and breath hold face immersion in water may help to decide the correlation between the two. Once this correlation is established, the efficacy of the diving reflex may be conveniently assessed in prospective divers using the method employed in this study.

**Corresponding address:** Department of Physiology, BGS Global Institute of Medical Sciences, Bangalore.

## Correlation between Experience in Yoga and Mental Health

P29

Ankur Kumar, Shirley Telles, Prabhat Mishra, Shivangi Pathak, and Acharya Balkrishna

Patanjali Research foundation, Haridwar, India

**Objectives:** The present study was intended to correlate between experience in yoga on hospital anxiety and depression.

**Methods:** Seven hundred sixty six volunteers with ages ranged between 14 and 86 years (group mean age  $\pm$  S.D.,  $50.21 \pm 14.15$ ) participated in this study. Their experience of the yoga techniques was a group average ( $\pm$  S.D.), of  $45.01 \pm 57.09$  months. The data were collected from the participants who attended a 7 day residential yoga camp in the north of India. A cross-sectional single group design was used in this study. They were assessed for anxiety and depression using State Anxiety Inventory (STAI) and Hospital anxiety and depression questionnaire (HADS). They practiced *asanas*, *pranayamas*, and meditation during the yoga camp for three hours, daily for seven days. Data was analyzed using Pearson correlation with PASW version 18.

**Results:** There was significant negative correlation between state trait anxiety, hospital anxiety and depression to the experience of yoga practice in months ( $p < 0.01$ ). There was also a significant negative correlation between state trait anxiety ( $p < 0.05$ ), and hospital anxiety ( $p < 0.01$ ) to the experience of yoga practice in minutes.

**Conclusions:** The result suggests that the experience in time per day and number of months influences anxiety and depression differently.

**Corresponding address:** Ankur Kumar, Patanjali Research foundation, Haridwar, India. EMail: ankurkumar5678@gmail.com

## Spectral analysis of HRV during acute mental stress in Type 2 diabetics as compared to non-diabetics

P30

Anupama Deepak, Aithal K, Khode VH, Shobha N

Department of Physiology and Department of Medicine, SDM Medical College, Dharwad.

**Background:** Cardiovascular Autonomic Diabetic Neuropathy (CADN) is widely studied because of its life threatening consequences. Reduced heart rate variation is the earliest indicator of CADN. Resting HRV has been studied in Type 2 diabetics but HRV response to acute mental stress has not been studied so far.

**Aims:** To study power spectral analysis of HRV during mental stress in diabetics, thereby to assess autonomic function in them.

**Methods:** 30 male asymptomatic, Type 2 diabetics with duration of diabetes of 2- 8yrs in the age group of 30-65 yrs were chosen as subjects. The 30 controls chosen were healthy individuals who were matched with the study group for age and sex. HRV analysis was done using ECG recorded at rest in supine position for 5 min and then during 5 min of acute mental stress testing. Mental stress was induced by serial subtraction test.

**Results:** At rest total power (TP), LF (low frequency) power and HF (high frequency) power were less in diabetics as compared to non-diabetics. Though acute mental stress increased LF power, and LF/HF ratio in both the groups, TP increased significantly only in non- diabetics. LF and HF were lower in diabetics even during stress.

**Conclusions:** PSA of HRV using mental arithmetic as a stressor can diagnose autonomic neuropathy at early stages in asymptomatic diabetics.

**Key words:** Diabetic autonomic neuropathy, Heart rate variability, Power Spectral Analysis, Acute mental stress.

**Corresponding address:** Dr Anupama Deepak, Department of Physiology, SDM College of Medical Sciences and Hospital, Manjushree Nagar, Sattur, Dharwad, Karnataka. E mail, ID: anupamadeepak789@yahoo.com

### Comparative study of different teaching modules in paramedical students

**Anupama Vithal Kumar Betigeri**

P31

Lady Hardinge Medical College & SSK Hospital, New Dehli 110001

**Aims and Objectives:** The teaching –learning process in first year paramedical students is very crucial because it is the time that they are taught about the fundamental concepts of medicine and their application in their professions.

**Method:** Study was undertaken on 51 first year Physiotherapy (BPT) students of BCIP New Delhi. For this, we exposed them to similar topic which was taught by using different teaching modules. They were divided into three groups, as-Group I used Overhead projector, Group II used Black Board and Group III used LCD Projector as a teaching mode. Identical questionnaires were asked to test the student's comprehension of topic after completion of the each individual teaching sessions.

**Result:** Scoring in group III was statistically significant than other groups. But 42.8% of students preferred black board as the preferred mode of teaching aid.

**Conclusion:** Even though the teaching modules have changed over time, Black board teaching still preferred by majority of students. But LCD projectors maintain interest, enthusiasm and attention seeking benefits in students. As we teachers must organise our teaching aids and try to maintain interest.

### Comparative study of cardiovascular fitness ( $Vo_2$ max), Body mass index (BMI), Body flexibility and Peak anaerobic power in female medical students amongst two ethnic groups

**Anuya A. Joshi, Kanchan Wingkar and Anand Joshi**

P32

**Aims and objectives:** Physical fitness is the prime criteria for survival and to achieve any goal and to lead healthy life. Obesity and physical inactivity comprise an important worldwide epidemic that has been linked to metabolic syndrome. So in present study few of the physical fitness parameters were studied.

**Methods:** Body mass Index (BMI), Waist to Hip ratio (W/H ratio), Shoulder –wrist flexibility, Hip trunk flexibility, Peak-anaerobic power and cardiovascular fitness ( $Vo_2$  max) were studied in 62 Indian and 45 Malaysian female medical students.

**Results:** It was observed that BMI, W/H ratio and  $Vo_2$  max parameters were within the normal limits in both the groups. However values of Hip trunk flexibility and Peak- anaerobic power parameters were significantly reduced in both the groups.

Compared to Indian students Malaysian students were having better physical fitness for all the parameters studied. ( $p < 0.001$ )

**Conclusion:** compared to Malaysian students Indian students were having lower values of physical fitness. Hip trunk flexibility and Peak- anaerobic power parameters were significantly reduced in both the groups. Which indicates that physical fitness shows decline in Indian students. This is pilot study. Large scale study is required to confirm the findings.

**KEY Words :** Body mass Index (BMI.), Waist to Hip ratio (W/H ratio), Body flexibility, Peak-anaerobic power, cardiovascular fitness (Vo<sub>2</sub> max)

**Corresponding address:** 21/2 Koyna Housing Society, Koyna Vasahat, Post.malkapur, Karad Dist. Satara Maharashtra. (m)9637176454

### Effect of sustained handgrip on dynamic lung function in healthy young adults and its correlation with fat free mass index

P33

**Aparajita Priyadarshini, Snigdha Prava Mishra, Bipin Bihari Pradhan.**

**Aim and Objective:** The study was taken up with an aim and objective to find out the lung function changes during sustained handgrip (SHG) and their relation with Fat Free Mass Index (FFMI).

**Method:** The study included 150 healthy young adults(86 male&64 female) of age group17-25 yrs. Their height, weight were measured and body fat percentage (BF%) was calculated by OMRON body fat monitor. Basal spirometry was done using FLOWHANDY ZAN 100 USB spirometer using ZAN software GP3.1XX based on Microsoft windows. They were subjected to handgrip at 30% of Maximum Voluntary Contraction (MVC) for 3 minute by handgrip dynamometer. Spirometry was repeated at the end of 3 minutes.

**Result:** FEV<sub>1</sub> decreased significantly after 3 minutes of sustained handgrip.FEV<sub>1</sub>&FVC showed significant correlation with FFM & FFMI. Correlation with BMI was insignificant.

**Conclusion:** From our study we found that FEV<sub>1</sub>&FVC showed better correlation with FFM&FFMI than BMI.

**Key Words:** SHG, MVC, BMI, BF%, FFM & FFMI

**Corresponding address:** Aparajita Priyadarshini, P.G Student, Dept of Physiology, M.K.C.G Medical College, Berhampur.State-ODISHA PIN-760004.Mail Id- draparajita1@gmail.com

### Study of Lipid Profile in Raja Yoga Meditators

P34

**Archana D. Mandape, Jyotsana R. Bharshankar, Mrunal S. Phatak**

Department of Physiology, Indira Gandhi Government medical college, Nagpur

**Objectives:** To observe the effect of Raja yoga meditation on serum lipid profile and fasting blood sugar levels in healthy adults.

**Methods:** The case control study included total 100 participants of either sex, in the age 25-45 years. The participants were divided in 2 groups-meditators (50) doing Raja-yoga meditation for more than 5 years and non-meditators (50) who were age, height and weight matched, served as controls. Serum total cholesterol (TC), Triglycerides (TG), High density lipoproteins (HDL), Low density lipoprotein (LDL), Very low density lipoprotein (VLDL) and fasting blood sugar (FBS) levels were estimated by kit method. The mean values for each parameter were compared using students-t test.

**Results:** Values for TC (134.34±17.77 Vs 146.34±30.83mg/dl) and TG (101.6±26.92 Vs 122.62±43.82mg/dl) were significantly less in meditators than non-meditators. HDL was (45.6±7.03 Vs 41.86±7.63mg/dl) was significantly more in meditators. LDL (81.34±16.71 Vs 86.4±14.29mg/dl) and VLDL (24.12±10.53 Vs 27.48±8.04mg/dl) values were lower in meditators though it was not statistically significant. The fasting blood sugar level was lower in meditators (73.12±12.43 Vs 76.52±6.30 mg/dl).

**Conclusions:** Meditators who were practicing Raja-yoga for more than 5 years showed lower levels of TC, TG, LDL, VLDL and FBS and higher level of HDL than non-meditators.

**Corresponding author:** Archana D. Mandape, C/O D. D. Sudame, Plot no.8, Renukamatanagar West, Hudkeshwarroad, Nagpur Email: archanadhanvijay@rediffmail.com

## Body Composition, Lipid Profile and Adipokines as Predictors of the Waist Circumference in Overweight and Obese Adults

P35

**Arti Yadav, Shirley Telles, Sachin Kumar Sharma and Acharya Balkrishna**

Patanjali Research Foundation, Haridwar, India

**Aims and Objectives:** The aim of this study was to assess the predictive capacity of body composition, lipid profile and adipokines estimated by using waist circumference (WC) in overweight and obese adults.

**Methods:** The present study was conducted on 67 persons of whom 5 were overweight (BMI  $\geq 25$  kg/m<sup>2</sup>) and 62 were obese (BMI  $\geq 30$  kg/m<sup>2</sup>). Their ages were between 20 and 54 years and there were 35 females in the group.

**Results:** Multiple regression analysis using SPSS Version 18 was carried out with WC as the dependent variable and with total body fat, total cholesterol, triglycerides, leptin and adiponectin as independent variables. Multiple regression showed a significant prediction of the variables [p<.001, adjusted R<sup>2</sup>=0.587]. However of the five independent variables studied body fat (kg) alone was a significant predictor of WC [p<.001, t = 9.53,  $\beta$  =.800; multi-collinearity statistics (tolerance) = .891].

**Conclusions:** The present results suggest that higher total body fat, measured as a part of body composition analysis can predict a higher WC, in this population of South Asian Indians.

**Corresponding address:** Arti Yadav, Patanjali Research foundation, Haridwar, India.  
E Mail: aartiyadav100@gmail.com

## PFT in automobile spray painters and non painters

P36

**Arun Kumar H.P, Dr. Shivakumar Veeraiah**

**Aim:** Automobile spray painting is an occupation in which there is high risk of developing obstructive airway disorders. There is greater risk of exposure to isocyanates present in spray paints which may have adverse effect on lung function. This study aims at assessing the lung function in automobile spraypainters.

**Objective:** To compare Pulmonary function test between automobile spraypainters and non painters.

**Methods:** 30 automobile spray painters and 30 controls were taken up for the study with consideration of inclusion and exclusion criteria. Later, pulmonary function tests were conducted on all subjects under all necessary precautions. Collected data was statistically analyzed.

**Results:** All PFT values were significantly lower in painters when compared to non painters. FVC=3.35±0.77 (p=0.02), PEF=4.60±1.66, FEV1=2.78±0.72, FEV1/FVC=82±0.09% and FEF 25-75 of 2.44±1.16 with p value < 0.001.

**Conclusion:** Automobile spray painting is associated with a high risk of work related obstructive respiratory pathology. The PFT values were significantly reduced among automobile spray painters.

**Corresponding address:** Dr. Arun Kumar H P; Room no. 311, BMCRI PG men's hostel, near Bowring and Lady Curzon hospital, Shivaji Nagar, Bangalore Fax no: 26704342; Email ID: muktha900@gmail.com

### **Improvement in Quality of Sleep and Life in Elderly Subjects Post Moderate Aerobic Activity.**

**Arun Kumar\*, Dr. Dhangauri N. Shenvi.**

P37

Department of Physiology, Seth G.S. Medical College & K.E.M. Hospital, Parel, Mumbai,

**Aim:** To study effects of moderate physical activity on sleep, mood and quality of life in elderly subjects with insomnia.

**Objective:** Analysis of sleep quality in elderly subjects doing moderate aerobic activity and non aerobic activity.

**Methods:** Randomized pilot study compared 8 weeks of moderate aerobic physical activity plus sleep hygiene to non-physical activity plus sleep hygiene in 19 adults aged  $\geq 56$  years with sedentary habits and chronic insomnia (mean age 62.57 (SD $\pm$ 4.08) years). Eligibility included primary insomnia for at least 2 months, habitual sleep duration < 6.5 hours and a Pittsburgh Sleep Quality Index (PSQI) score > 5. Outcomes included sleep quality, mood and quality of life questionnaires (PSQI, Epworth Sleepiness Scale[ESS] and Short-form 36[SF36]).

**Results:** The aerobic activity group reported significant improvement in sleep quality on the global PSQI ( $p < 0.0001$ ). Their sub-scores for sleep duration, sleep latency, daytime dysfunction and sleep efficiency improved significantly ( $p < 0.05$ ) as compared to the non physical activity group. ESS and SF36 also showed reduction in daytime sleepiness, better mood and quality of life.

**Conclusion:** Sleep quality as well as mood and life quality are effectively improved by simple addition of moderate aerobic physical activities and sleep hygiene in daily routine of elderly with chronic insomnia.

**Corresponding address:** Dr. Arun Kumar\*, Department of Physiology, Seth G.S. Medical College & K.E.M. Hospital, Parel, Mumbai, Email: docarun26@gmail.com

### **Study of predominant neural component (somatosensory, vestibular and visual) involved in static balance in healthy young adults.**

P38

**Arun Prakash. M, Komala Devi. SD**

Department of Physiology, Vydehi Institute of Medical Sciences & Research Centre

**Aim:** Aim of the study is to examine which sensory system predominates in maintenance of static balance (e.g., visual, vestibular, and somatosensory) in healthy young adults.

**Objectives: (1)** To examine the visual, vestibular, and somatosensory in maintenance of Unipedal stance and identify predominant neural component. **(2)** To correlate the effect of BMI, Yoga, Physical activity, stress in maintenance of unipedal stance.

**Method:** 29 young male volunteer in the age group of 18-20 years were participated in the study. Participants BMI, Stress level, food habit, sleep pattern, yoga practice, level of physical activity were noted. Unipedal stance test (UPST) was done on the participants.

**Results:** The mean value for UPST on hard surface with Eye Open was  $78.45 \pm 50.566$ , with Eye closed  $11.45 \pm 15.539$ , on Foam surface with eye open  $44.10 \pm 30.879$ , Foam surface eye closed  $4.24 \pm 2.899$ . Test was significantly better in people when eye was open in hard surface and foam surface. No difference was seen between UPST on hard surface with eyes closed and foam surface with eyes closed. Other factors did not appear to affect the UPST.

**Conclusion:** People with contribution from all the three components were able to balance the best. Vision and somatosensory components appeared to have equal contribution.

**Corresponding address:** Department of Physiology, Vydehi Institute of Medical Sciences & Research Centre, #82, Nallurahalli, Near BMTC 18th Depot, Whitefield, Bangalore - 560 066 (Karnataka) Email: arun.prakash314@gmail.com

### **A Pilot study to assess skeletal muscle function using Isokinetic dynamometry in healthy young and middle aged Indian male subjects.**

P39

**Aruna R, Sucharita S, Avadhany ST**

Department of Physiology, St John's Medical College, Bangalore.

**Background:** Skeletal muscle function is generally assessed using simple dynamometer. However, there is lack of data using much accurate method like isokinetic dynamometry in healthy Indian subjects.

**Objectives:** 1. To assess skeletal muscle function in young (18-30 years) and middle aged (31-60 years) healthy Indian male subjects.; 2. To evaluate the association between muscle mass, fat mass and muscle function in healthy Indian male subject.

**Methods:** 26 healthy males were grouped based on their age. Isometric/Isokinetic and endurance exercise were performed on lower limb. Other measurements included anthropometry, muscle mass and muscle volume.

**Results:** Peak torque during isometric muscle function was significantly lower in middle aged group compared to young adult group. Isokinetic peak torque at 60, 120, and 180 were significantly lower in middle age group. Muscle mass, muscle volume and percentage body fat was higher in middle age group compared to young adult group. There was positive association between muscle mass and muscle strength ( $r = .67$ ,  $p = .001$ ).

**Conclusions:** Pilot data demonstrated that skeletal muscle function is reduced in middle age healthy Indians in spite of having greater body fat and muscle mass. Further studies will help us understand these changes and mechanisms, which could be operating.

**Corresponding address:** Aruna R, Department of Physiology, St John's Medical College, Bangalore 34. Email : arunaraju10@gmail.com

### **Evaluation of Laboratory Based Learning sessions in physiology of first year undergraduate medical program**

P40

**Asha Vashe, Reem Rachel Abraham, Sharmila Torke, Vinod Pallath, Asha Kamath**

Department of Physiology, Melaka Manipal Medical College, Manipal, Karnataka.

**Aim:** To evaluate the laboratory based learning (LBL) sessions included in physiology curriculum of first year MBBS program.



**Objectives:** To explore students' and teachers' perspectives regarding LBL sessions in physiology and to find out students' performance in four block-end practical examinations.

**Methods:** Questionnaires for students and teachers inviting responses in the form of Likert scale were developed and administered for first year MBBS students (n=113) and to teachers of physiology department (n=13). Open ended questions were added in the questionnaire for faculty members. Analysis of performance of students in four block-end examinations was done.

**Results:** Students gave positive response to all items, with a median score of 4. Teachers differ only in student related items and expressed that current laboratory exercises were adequate, while stressing the need for students to focus more on practice. Examination performances showed that in the first and second blocks the passing percentage was 98, while in the third and fourth block it was 100.

**Conclusion:** Majority of students and teachers were satisfied with the content & methodology employed in current laboratory exercises in physiology. Analysis of performance of block practical examination substantiates the validity of the responses.

**Corresponding address:** Asha Vashe, Reem Rachel Abraham, Sharmila Torke, Vinod Pallath, Asha Kamath, Department of Physiology, Melaka Manipal Medical College, Manipal, Karnataka. Email Id: drashabhat@gmail.com

## **Correlation of peripheral granulocyte counts with different grades of functional lung impairment in copd patients of Manipur**

P41

**Ashem Nandarani Devi<sup>1</sup>, W. Kanan<sup>2</sup>**

Department of Physiology, RIMS, Imphal-795004; E-mail id: nandu7229@gmail.com

**Objective:** To correlate the peripheral granulocyte counts with different grades of functional lung impairment in COPD patients of Manipur.

**Method:** This study was conducted in the Department of Physiology, RIMS, Imphal. 34 COPD patients were taken comprising of 23 males and 11 females. Lung function was studied by computerized spirometer (Helios 701). Blood leukocyte counts (absolute neutrophil count, absolute eosinophil count, absolute basophil count) of all the patients were done.

**Results:** Grading of COPD was done according to GOLD guidelines based on FEV<sub>1</sub>% predicted. 20.58% of patients had mild COPD, 23.52% of patients had moderate COPD, 29.41% of patients had severe COPD and 26.47% of patients had very severe COPD. Mean abs.neutrophil count in mild patients = 4697.34/cu.mm, in moderate patients = 6249.09/cu.mm, in severe patients = 6529.63/cu.mm and in very severe patients = 8667.33/cu.mm (Normal = 2500-7000/cu.mm). Mean abs.eosinophil count in mild patients = 182.6/cu.mm, in moderate patients = 274.9/cu.mm, in severe patients = 207.4/cu.mm and in very severe patients = 206.7/cu.mm (Normal = 100-300/cu.mm). Mean abs.basophil count was 0 in all the four grades of COPD.

**Conclusion:** This study showed that increase in peripheral neutrophil count correlates with the increase in the severity of COPD, but not so in the case of peripheral eosinophil and basophil counts.

**Corresponding Address:** Post Graduate Trainee, Department of Physiology, RIMS, Imphal; Professor, Department of Physiology, RIMS, Imphal

## Comparative study of heart rate and blood pressure responses to graded treadmill exercise in overweight and normal weight young adults

P42

Ashmita Chakraborty, Supriya sardar, Indira Ghosh, Sumitra Sen.

**Aims and Objectives:** 1) To compare changes in heart rate and blood pressure before, during and after graded treadmill exercise in overweight and normal weight young adults. 2) To detect any abnormal hemodynamic response to exercise in overweight young adults.

**Methods:** 1) Study Design: Cross sectional observational study. 2) STUDY AREA: Department of Physiology, R.G. Kar Medical College and Hospital. 3) Study Period: March 2013 to September 2013. 4) Study Population: Otherwise healthy young adults both male and female in the age group 18-25 years. 5) Plan of Grouping: According to B.M.I. division into normal weight (BMI 18.5-22.9) and overweight (BMI 23-24.9) was done.

Clinical Examination: BMI and waist-hip ratio.

**Conclusion:** 1) Resting heart rate and diastolic blood pressure are higher in the overweight group compared to normal weight persons. 2) At 3<sup>rd</sup> minute of exercise increase in heart rate and systolic blood pressure from the basal state is more in the overweight than normal weight persons.

**Acknowledgement:** Dr. A.B.S. Mahapatra, Head of the department.; Dr. Md.S.Khan. Assoc. Prof., Department of Physiology; R.G. Kar Medical College and Hospital. Kolkata - 700004.

**Corresponding address:** Email address: drashmitac@gmail.com; Contact no.: 919231550982; North charakdanga. P.O.-Italgacha. DumDum; Kolkata -700079.

## Effect of gender difference on short term memory

P43

Ashwathy V T, R S Koujalgi, Suresh. Y. Bondade

Department of Physiology, J. J. M. Medical College, Davangere, Karnataka.

**Background:** The developmental progression in short-term memory (STM) is documented throughout childhood. Comparing males and females is natural in society.

**Objective:** To determine the effect of gender difference on STM.

**Materials and methods:** Twenty girls and twenty boys of age group 10-13 years were selected. Children with average IQ were considered on their academic performance. 4 divisions of STM- phonological loop, visuospatial sketchpad, central executive, and episodic buffer tested using subtests- personal information, Mental Control, Sentence Repetition, logical memory, word recall meaningful, digit span, word recall non-meaningful, picture recall, delayed response learning, Benton Visual Retention Test, paired associate learning, Cattle's retentivity test. Results were evaluated using specific scoring system. Statistical analysis was done for each test.

**Results:** Out of total score of 131, girls scored 97.5 and boys 86 by taking mean. Score was significantly more in following subtests- logical memory ( $p < 0.05$ ), word recall meaningful ( $p < 0.05$ ), digit forward ( $p < 0.001$ ), digit backward ( $p < 0.001$ ), word recall non-meaningful ( $p < 0.01$ ), picture recall ( $p < 0.05$ ), Benton Visual Retention Test ( $p < 0.05$ ), Cattle's retentivity test ( $p < 0.05$ ).

**Conclusions:** Girls have a stronger short-term memory than boys. Because of short-term memory's relation to spatial, logical, and working memory this experiment proves to be a significant study in hopefully breaking down gender barriers in the work force.

**Correspondence Address:** Dr Ashwathy V T, Department of Physiology, J. J. M. Medical College, Davangere, Karnataka. Contact: +918892158682 Email: ashwathy.vt@gmail.com

### **Assessment of body composition by bioelectrical impedance analysis method in Type II diabetic women.**

P44

**Ashwini G. Darokar \*, B.A.Thobani, J.R. Bharshankar, M .S. Phatak**

Dept of Physiology, Indira Gandhi Government medical college, Nagpur

**Aims:** To assess the body composition in type II diabetic women.

**Material and Methods:** A case control study was conducted including 50 women in the age group of 30-50 yrs randomly selected from general population. They were divided into diabetic group (25) women diagnosed as type II diabetes and non diabetic control group (25) women with age and weight matched. Their age, weight, height, waist and hip circumference was measured. The body composition was analyzed by Quadscan 4000 body composition analyzer to get values for body fat (BF %), lean body mass (LBM %), waist-hip ratio (W/H) and body mass index (BMI).

**Results:** BF% in diabetic group was (35.63±4.10) statistically significantly higher than controls (29.12±2.63), (p<0.05). LBM % was significantly lower in diabetic women (64.36±4.10) than in controls (71.02±2.33), (p<0.05). W/H ratio was also significantly higher in diabetic women (0.92±0.04 Vs 0.81±0.05), (p<0.05). BMI was not statistically different in between diabetic and control group.

**Conclusions:** Body composition by Bio-electrical impedance analysis in type II diabetic women shows increase BF% and W/H ratio as compared to the age and weight matched controls. These observations may suggest the tendency of central deposition of fat in the diabetic women.

**Corresponding address:** Ashwini G. Darokar, Indira Gandhi Government medical college, Nagpur (MH), E-Mail- dramol\_patel@yahoo.co.in

### **Correlation of anxiety, alertness & excessive day time sleepiness in late pregnancy.**

**Ashwini Avinash Rathod and V. D. Tajane**

Dept. of Physiology, Govt. Medical College, Nagpur

P45

**Aims:** To study correlation of anxiety, alertness & excessive day time sleepiness in third trimester of pregnancy & it's comparison with pre-pregnancy period.

**Objectives:** Sleep problems in pregnancy are common, with most pregnant women reporting declining sleep quality & increased night waking especially in the third trimester. Insomnia & increased wakefulness after sleep onset can result from various potential causes including gastro-esophageal reflux, discomfort, frequent micturition, dyspnoea & minimally due to Anxiety. Poor sleep quality & lowered sleep duration are associated with a higher incidence of pre-term birth, gestational hypertension as well as gestational diabetes in late pregnancy.

**Methods:** Third trimester pregnant women (n=50) were selected of age group 24-30 years having normal Body Mass Index. Questionnaires were used to calculate score of Anxiety by Hamilton's anxiety rating scale, Alertness by Stanford's sleepiness scale and sleepiness by Epworth's sleepiness scale.

**Results** Before pregnancy, the mean reported duration of night-time sleep was 8.1 hours (SD 1.1). Only 29% rated their sleep quality in the last week as very good or fairly good, compared with 82% rating their sleep this way before the pregnancy. The main reason for sleeping difficulties were discomfort (64%), Pain (32%), & increased anxiety (2%). Only 4% of women had an abnormal Epworth's sleeping scale score (i.e.  $\geq 10$ ) prior to pregnancy, whereas in last week 33% scored in abnormal range. Likewise 5% had regularly napped during day time before pregnancy, compared with 41% in last week.

**Conclusion:** Sleep problems are common in women in late pregnancy & increased markedly compared with before pregnancy and are minimally related to anxiety.

### **Comparative study of isometric handgrip exercise among blind children and normal sighted children.**

P46

**Ashwini RD., Rajashekar RK.**

Department of Physiology, Belgaum Institute of Medical Sciences, Belgaum, Karnataka.

**Objective:** Comparison of the isometric hand grip exercise among blind children and normal sighted children of the same age group.

**Method:** Cases - sixty blind children from blind school. Controls - sixty normal sighted children from regular schools in Belgaum. Age group: 10 - 17 years. The subject was asked to exert maximal hand grip strength on hand grip dynamometer with dominant hand. The maximum voluntary contraction was determined. Handgrip was then maintained at 30% of that maximum for 3 to 5 minutes. Blood pressure was measured during rest and thrice during the handgrip at 1 minute interval in the non-dominant hand.

**Results:** Z test was used for the analysis of the following parameters - Baseline DBP among cases and controls, Maximum DBP reached during handgrip and Comparison of maximum DBP reached during handgrip and baseline DBP among cases and controls.

**Conclusion:** There was significant increase in these parameters among cases when compared to controls, probably due to increased stress in them.

**Key words:** Isometric handgrip exercise, Diastolic blood pressure, Autonomic function test.

**Corresponding address:** Dr. Ashwini R Doyizode, Post graduate student, Department of Physiology, Belgaum Institute of Medical Sciences, Belgaum, Karnataka. Email: drashwinilokre@gmail.com; Mobile: 9986374814

### **Study on the effect of hypertension on nerve conduction parameters in smims, kulasekharam.**

**Aswathy L, Kumarisheela MS, Devi S, Mythilibai K.**

P47

Department of Physiology, Sree Mookambika Institute of Medical Sciences, Kulasekharam.

**Aims & Objectives:** To determine the effect of hypertension in nerve conduction parameters.

**Methods:** A cross sectional study of ten normal subjects and thirty hypertensive patients of more than ten years duration with age group between 30-60 years are recruited from OPD of medicine department and detailed history including age, height, weight, BMI are taken and electrophysiological evaluation is done in the research lab of physiology by RMS neuropack with evoked potential measuring system. Latency (m sec), amplitude (mv), conduction velocity (mt sec) of tibial nerve and sural nerve of both limbs are measured.

**Results:** In this study there is no statistical significance in latency, amplitude, conduction velocity of tibial & sural nerve in both lower limbs ( $P > 0.05$ ).

**Conclusion:** In the present study, hypertension showed no significant change in nerve conduction parameters. It may need further studies with more sample size while interpreting nerve conduction studies in hypertension.

### Work related stress in white collar workers: Focus on cardiometabolic parameters.

P48

Aswini Dutt.R<sup>1\*</sup>, Sampritha UC<sup>2</sup>, K. Shankar Bhat<sup>3</sup>

<sup>1</sup>Associate Professor, Department of Physiology, Yenepoya Medical College, Deralakatte, Mangalore, 575018. Karnataka, India.;

<sup>2</sup> Second year MBBS Student, Yenepoya Medical College, Deralakatte, Mangalore, 575018. Karnataka, India.; <sup>3</sup> Professor and Head, Department of Physiology, Yenepoya Medical College, Deralakatte, Mangalore, 575018. Karnataka, India.

**Introduction:** Stress has become an integral part of our lifestyles. Stress to some extent improves management skills, job performance but when crosses the limit results adversely on health-physical and mental in both genders. Work related stress has been known to cause many ill-effects on the body.

**Aims and Objectives:** (1) To analyze stress levels in middle aged subjects using questionnaire. (2) To study the effects of work related stress on Blood Pressure (BP), Obesity markers like Body Mass Index (BMI) and Waist-Hip (W/H) ratio.

**Methods:** 75 bank employees in the age group of 35–45 years were included in the study. A pretested and validated questionnaire on work stress was given to the participants and their responses were collected. Based on the analysis of their job stress levels, study group was divided into control (Non-stressed) and test group (Stressed) among the genders. Their age, work experience, BP, BMI and W/Hip ratio were recorded.

**Results and Conclusions:** Males had more stress levels compared to females. Among both the genders, the test group had more BP, BMI and W/H ratio as a result of activation of Hypothalamo-Pituitary-Adrenal axis. This study indicates that while addressing the complications of job stress, a more aggressive working health policy has to be implemented at all work places.

**1\*:** Presenting Author and Corresponding Author: (O) Associate Professor, Department of Physiology, Yenepoya Medical College, Deralakatte, Mangalore, 575018. Karnataka, India. Email: drdutt23@yahoo.com; (R) 'Shreyas', 3H-1B, Navanagara, 1<sup>st</sup> Main, Landlinks Township, Derebail-Konchady, Mangalore, 575008. Karnataka. India.

### Effect of different phases of menstrual cycle on cardiovascular parameters and whole body reaction time in female athletes

P49

Avantika K. Kayapak, S. A. Mundewadi and Pradnya Waghmare

Speed of movement and quick reactions are prized qualities in athletes. This factor partly determines how successful a basketball player or soccer player can be on defence. Fluctuating levels of female sex steroids across the normal menstrual cycle can affect sensory motor association of an individual. The aim of present study is to determine any changes in cardiovascular parameters i.e. Pulse rate and blood pressure and whole body reaction time; during different phases of normal menstrual cycle. The study was done on 50 female athletes in the age group of 15 to 25 years engaged in different sports activity. It was found that there is increase in pulse rate and blood pressure during premenstrual phase; also there is prolongation of whole body reaction time during this phase. This may be because of retention of salt and water due to ovarian steroids, fluctuating level of which also affects the processing capabilities of central nervous system.

**Correspondence address:** Dr. Avantika K. Kayapak, At. Post Gokunda, Tq. Kinwat, Dist. Nanded, Maharashtra.  
Email: avani.wanjare@gmail.com

## Postural variation of pulmonary diffusing capacity in type-II diabetes mellitus

P50

Avinash kumar<sup>1</sup>, K K Deepak<sup>1</sup>, Viveka P Jyotsna<sup>2</sup>, Anjana Talwar<sup>1</sup>

<sup>1</sup> Department of Physiology & <sup>2</sup> Department of Endocrinology, All India Institute of Medical Sciences, New Delhi.

**Introduction:** Type II Diabetes Mellitus (DM) can cause the development of pulmonary complications due to collagen & elastin changes, as well as microangiopathy. Posture related changes of diffusing capacity could be considered as an early sensitive marker of diabetic microangiopathy.

**Aim:** Investigate relationship between postural variation of pulmonary diffusing capacity in type-2 diabetes mellitus & association with microangiopathy related complication.

**Methods:** Carbon monoxide diffusing capacity (DLCO) was measured by the single breath method. Four DLCO measurements, two in sitting & two in supine position were performed in 12 DM and 9 age and sex matched control subjects using gas mixture.

**Results:** In type II DM patients Diffusing capacity was found to be significantly lower in supine position as compared to sitting position ( $18.37 \pm 6.486$  vs  $21.09 \pm 8.715$ , p value = 0.020) while in control subjects it was found to be significantly higher in supine position as compared to sitting position ( $29.52 \pm 4.958$  vs  $27.58 \pm 4.208$ , p value = 0.005)

**Conclusion:** This postural test can be used for an early assessment of pulmonary function abnormalities in type II diabetes patients.

## A study on analysis of Heart Rate Variability in hypertensive individuals

P51

B. Arun Kumar, N.Nirmala

Department of Physiology, SVMCH & RC, Puducherry

**Aims & Objectives:** To analyse Heart Rate Variability (HRV) in hypertensive individuals.

**Materials & Methods:** The study was conducted on 30 normotensive and 30 hypertensive subjects (BP  $\geq 140/90$  mm Hg, according to JNC-7 classification). Lead-II ECG was recorded using the instrument PHYSIOPAC-PP4, MEDICAID system, Chandigarh and HRV analysis was done using Kubios HRV analyser. Spectral indices of HRV such as total power (TP), normalized low frequency power (LFnu), normalized high frequency power (HFnu), ratio of low frequency power to high frequency power (LF-HF ratio), standard deviation of normal-to-normal RR intervals (SDNN), root mean square successive difference (rMSSD) and the proportion of NN50 to the total number of NN intervals (pNN50) were assessed.

**Results:** Our results showed significantly reduced TP (p<0.05), HFnu (p<0.05), SDNN (p<0.05), rMSSD (p<0.05) and pNN50 (p<0.05) in hypertensive individuals. LFnu and LF-HF ratio was significantly increased (p<0.05) in hypertensive individuals.

**Conclusion:** There is an increased sympathetic activity and a decreased vagal tone associated with hypertension. Thus, HRV can be used as a routine screening test to predict the future risk of hypertension at an earlier stage and also for a better prognosis during treatment.

**Corresponding Address:** Dr.B.Arun kumar, 118, Chetty street, Puducherry-1; Email: ananth89bala@gmail.com

## Role of Interleukin-6 in evaluating stress on surgeons during surgery

P52

**B.L. Preethi, J. Elizabeth, G. Dayananada, Hariparasad, Harish, A.C. Ashok**

Department of Physiology, Department of Surgery- M.S. Ramaiah Medical College, Bangalore

**Aims:** Interleukin 6 (IL-6) has been shown to be stress responsive; effects of acute stress on IL-6 have been less well characterized.

**Objectives:** To evaluate if stressful conditions experienced by surgeons while performing surgery may result in increased IL-6 and to compare surgeons & non surgeons personality of individual's adjustment to stress using BAI questionnaire.

**Methods:** 40 subjects, 20 Surgeons & 20 controls were enrolled. Evaluation with Bells Adjustment Inventory BAI questionnaire was done. Serum IL-6 levels measured before and after surgery.

**Results:** Baseline IL-6 in Controls was 16.09 +16.35 v/s Surgeons 28.57+17.07 (ns). BAI personality Scores was: Surgeons v/s Controls - in Home (3.6+3.9 v/s 2.8+3.9)-good, Health(4.0+3.5v/s 4.8+5.1 p<.001) better for surgeons, Social(6.5+5.3v/s 6.3+7.0 p<.035) -higher aggressiveness in surgeons, Emotional(4.5 + 4.4 v/s 5.5+6 p<.008) -surgeons had better emotional scores. Controls scored better in total adjustment (25.3+10.29 v/s 17.0+20.4 p<.000). Evaluating the stress of surgery - IL6 was significantly higher after surgery 29.5 +11.4 (p < .000) (pre-surgery IL6 28.5 +17).

**Conclusions:** This study was able to demonstrate that IL-6 can be used for evaluation of acute stress. Surgical stress on surgeons manifested as a significantly higher IL-6 levels.

**Correspondence address:** Dr. B.L. Preethi, Associate Professor, Department of Physiology, M.S. Ramaiah Medical College, MSRIT post, MSR Nagar, Phone: +91-9845803787, E-mail: blpreethi97@rediffmail.com

## Induced pluripotent stem cells – a conduit to the future

P53

**Balaji Muruga.B**

Department of Physiology, Kempegowda Institute Of Medical Sciences, Bangalore.

Induced pluripotent stem cells, (iPS/iPSCs) are a type of pluripotent stem cell artificially derived from a non-pluripotent cell, typically an adult somatic cell by inducing a transfection of specific genes, master transcriptional regulators Oct-3/4 and Sox2. After 3–4 weeks, transfected cells begin to become morphologically and biochemically similar to pluripotent stem cells, and isolated through morphological selection, doubling time, or through a reporter gene and antibiotic selection. The ability to reprogram somatic cells into iPSC cells that are pluripotent and can self-renew has transformed the fields of developmental biology and regenerative medicine.

In October 2012, Yamanaka and fellow stem cell researcher John Gurdon were awarded Nobel Prize in Physiology or Medicine for this discovery. The first human clinical trial using autologous iPSCs is approved by the Japan Health Ministry, to be conducted in 2014 in Kobe. iPSCs from skin cells from six patients suffering from wet ARMD will be reprogrammed to differentiate into RPE cells, transplanted into

affected retina, where degenerated RPE tissue has been excised. Safety and vision restoration monitoring is expected to last 1-3 years. The benefits of autologous iPSCs are there is theoretically no risk of rejection and eliminates the need to use ES cells.

**Keywords:** iPSCs - Induced Pluripotent Stem Cells, ARMD- Age Related Macular Degeneration, RPE- Retinal Pigment Epithelium, ES- Embryonic Stem Cells.

**Corresponding address:** Dr.Balaji Muruga.B, Post Graduate, Dept. of Physiology, Kempegowda Institute Of Medical Sciences, BSK II STAGE, Bangalore-70. (Mobile no: 9738947979)

### **A Cross Sectional Study of Serum Level of Total Cholesterol and Serum Level of Triglyceride Among Regular Yoga Practitioners and Among Subjects Without Such Practice in the Age Group Of 20-45 Yrs in the Guwahati City**

**Banani Boro<sup>1</sup>and Biju Choudhury (Dutta)**

P54

**Aims and objectives:** The present study evaluates serum cholesterol and triglyceride level in regular yoga practitioners and nonpractitioners.

**Methods:** A cross sectional study of randomly selected 60 adults in age group of 20- 45 yrs of both sexes in the Guwahati city was done. Out of them 30 subjects were regular yoga practitioners and the rest were nonpractitioners. Serum cholesterol and triglyceride were estimated by Enzymatic Colorimetric method in both the groups. A comparison of serum levels of cholesterol and triglyceride were done.

**Results:** The 30 yoga practitioners had mean serum cholesterol level (mg/dl) of  $154.066 \pm 11.866$  and mean serum triglyceride level (mg/dl) of  $132.56 \pm 3.775$ . The nonpractitioners had mean serum cholesterol level (mg/dl) of  $181.8 \pm 12.35$  and mean serum triglyceride level (mg/dl) of  $158.46 \pm 7.695$ . Data analyzed using Unpaired Student t-test showed serum cholesterol and triglyceride levels were significantly low (p value <0.05) in the yoga practitioners than the nonpractitioners.

**Conclusions:** From the above study it can be concluded that regular yoga practice results comparatively low serum cholesterol and triglyceride.

### **A comparative study of cardiovascular parasympathetic function between obese and nonobese young adults**

**Bandana Kakati, Shrabani Barman**

Dept. of Physiology, Gauhati Medical College, Guwahati-32;

P55

**Aim and objectives:** Obesity is a disorder of energy balance. Obesity increases mortality risk supposedly due to cardiovascular disorders related to either continuously lowered parasympathetic or altered sympathetic activation. In this study, an attempt is made to see whether there is any alteration in cardiovascular parasympathetic functions in young obese individuals as compared to non obese individuals.

**Methods:** Place of study: Gauhati Medical College during June and July 2013. Subjects: 60 males of age group 18-30 years. 30 of them were obese (case, BMI >30Kg/M<sup>2</sup>) and 30 non-obese (control, BMI <30Kg/M<sup>2</sup>). Persons suffering from autonomic neuropathy, alcoholics and smokers were excluded from the study. Body mass index was calculated by: Weight (Kg) / height (M<sup>2</sup>) Parasympathetic system was evaluated by 2 tests (using electrocardiograph): (1) Heart rate response to standing. (2) Heart rate response to Valsalva maneuver. Statistical analysis was done by using student t-test.

**Results and conclusion:** The results of this study showed significantly low (p<0.001) S/L ratio and Valsalva ratio (p< 0.001) in cases as compared to controls. From this we can conclude that parasympathetic activity is impaired in obese which may cause various cardiovascular complications.

**Corresponding address:** Bandana Kakati, Dept. of Physiology, Gauhati Medical College, Guwahati-32; Email ID: andanakakati01@gmail.com.



## A cross sectional study of physical fitness in relation to body mass index among medical students, Gauhati Medical College, Guwhati

Barnali Sarma, Jyotismita Deka, Shrabani Barman

Dept.of Physiology, Gauhati Medical College, Guwahati-781032

P56

**Aims and Objective:** Due to the rapid changes in our lifestyle the problem of obesity has increased. Obesity directly or indirectly causes heart and blood related complications. So we aimed to evaluate the physical fitness with respect to BMI among medical students of Gauhati Medical College, Guwahati.

**Methods:** 30 medical students of Gauhati Medical College were taken as subject for the study which was done throughout August 2013. Among them, 15 students were overweight and 15 students were underweight. Physical fitness was assessed by Harvard Step Test and BMI calculated by Quetlet's Index. Statistical analysis was done using unpaired student's t- test.

**Results:** The mean value of Havard Step Test was found higher in overweight ( $84.70 \pm 6.4$ ) subjects as compared to the underweight ( $17.53 \pm 2.3$ ) subjects. The difference is statistically significant ( $p < 0.05$ ).

**Conclusion:** The study showed a positive association between BMI and physical fitness. So exercise and healthy dietary habits should be strictly emphasized even at a young age in order to have a healthy life in later part.

**Corresponding address:** Dr. Jyotismita Deka, Assistant Professor of Physiology, Gauhati Medical College, Guwahati-781032, e-mail: drjyotismita77@gmailcom

## Study of prevalence of asymptomatic coronary artery disease in Type II Diabetic patients of Kamrup district in Assam by treadmill test.

Barnali Kalita<sup>1</sup> and Jyotismita Deka<sup>1</sup>

P57

**Aims and objectives:** Coronary artery disease often silently kills TypeII diabetic patients. We therefore, aimed to study the prevalence of silent ischemic changes in clinically asymptomatic TypeII diabetic patients using Treadmill exercise test.

**Materials and methods:** This is a cross-sectional study on fifty patients of TypeII diabetes mellitus asymptomatic of coronary artery disease. The Treadmill test performed to detect ischemic changes was according to modified Bruce protocol.

**Results:** We studied 50 TypeII diabetic patients without any clinical evidence of Ischemic heart disease. Out of the cases, 33(66%) were male and 17(34%) were females. The results of Treadmill test showed that there is prevalence of Coronary artery disease in the study population. Among the total 50 patients, 26(52%) showed positive and 24(48%) showed negative TMT findings. We also compared the mean distribution of age and BMI between TMT positive and negative patients using t-test. It showed highly significant results ( $p < 0.01$ ).

**Conclusions:** Ischemic changes of heart in TypeII diabetic patients can well be diagnosed using Treadmill test even if they remain clinically asymptomatic.

**Correspondingaddress:** Dr. Barnali Kalita, Assistant Professor of Physiology, Gauhati MedicalCollege, Guwahati-781032, E-mail:sanjibmedhi@rediffmail.com, barnalimedhi22@gmail.com,

## Benefits of 3 Months of Yoga in Patients with Type 2 Diabetes Mellitus

P58

Beena, Jai Kumar, Sushma Sood, Mohammad Arkham, Deepti Aggarwal & Piyush Bansal

Dept. of Physiology, PGIMS, Rohtak, Haryana

**Aims & Objectives:** Stress is one of the causal factors for many chronic diseases like hypertension, diabetes and cardiovascular diseases. Type 2 diabetes mellitus (DM2) is more prevalent than type 1. Its association with obesity forces us to think that life style is one of the components for the aetiology of DM2. Yoga is rapidly gaining popularity and has many proven benefits. The purpose of our study was to study the effects of different yogic exercises on the body weight, body mass index, blood glucose and HbA<sub>1c</sub> levels.

**Methods:** The study was conducted on 30 patients of DM2 (age 40-50 years of 1-5 years duration). All the patients performed a set of yogic exercises for 3 months duration. Basal recording of body weight, body mass index, blood glucose level (both fasting and post prandial) and HbA<sub>1c</sub> levels were taken at the time of recruitment and the second reading at the end of 3 months.

**Results:** The fasting blood glucose and post prandial levels reduced by 41.97% and 47.21% respectively. HbA<sub>1c</sub> levels showed a decrease of 20.80%. The body weight and BMI values also reduced by 6.10% and 6.40% respectively.

**Conclusion:** Present study indicates that yoga may be an effective adjunct to standard medical treatment in managing diabetes and should be made part of the standard treatment regime.

**Keywords:** Yoga, Pranayama, Diabetes Mellitus, Blood Glucose, Body Mass Index, HbA<sub>1c</sub>

**Corresponding address:** Beena, Associate Professor, Dept of Physiology, PGIMS, Rohtak, Haryana

## Gender difference in examination stress on physical and hematological parameters in medical students

P59

Bhagyalakshmi Kodavanji\*, Nayanatara ArunKumar\*, Anupam Noojibail\*, Ramesh Bhat\*, Sheila R Pai\*

\*Departments of Physiology, Center for Basic Sciences, Kasturba Medical College (Manipal University), Bejai, Mangalore,

**Background and Aims:** Examinations are an inevitable necessity of education. The present study aims to investigate the gender differences in the impact of exam stress with reference to parameters such as blood pressure, body mass index (BMI) and differential leukocyte count.

**Method:** Twenty seven males and twenty four females healthy students were randomly selected from the MBBS course of KMC Mangalore. Blood pressure, weight, height were measured and differential leucocyte counts was done in the pre exam and post exam were analyzed.

**Results:** Systolic blood pressure between pre exam period and post exam period showed a statistically significant ( $P < 0.001$ ) increase in both in males and females. A non-significant increase in the body weight was observed in the females during the post exam period. Further, a statistically significant increase ( $P < 0.001$ ) in the neutrophil count and significant decrease ( $P < 0.001$ ) in the all the other cell lines was observed both in males and females in the post exam period.

**Conclusions:** Our study did not show any significant gender variations in both hematological and physical parameters in response to examination stress. Social support will enable the students to cope adequately with exam stress and improve their performances.

**Key words:** Examination stress, Blood pressure, BMI, Differential leucocyte count.

**Corresponding address:** Dr. Bhagyalakshmi Kodavanji, Associate Professor, Department of Physiology, Kasturba Medical College (Manipal University), Bejai, Mangalore- 575004, Karnataka, India. Email: bhagyaavabratha@yahoo.com

## **Influence of BMI on cardiac autonomic activity in different phases of menstrual cycle in older adults**

**Bhagyashree N<sup>1</sup>, Ramya K<sup>1&2</sup>, Ramaswamy C<sup>1</sup>, Jayalakshmi B S<sup>1</sup>, Ganesh M<sup>1</sup>, Thulasibai S<sup>1</sup>, Umamaheshwari K<sup>1</sup>**

<sup>1</sup> Dept of Physiology, A C S Medical College & Hospital, Chennai.

<sup>2</sup> Dr Ramaswamy C, Dept of Physiology, Saveetha Medical College, Thandalam, Chennai.

P60

**Introduction:** Menstrual cycle is a physiological occurrence in women. This is associated with variations in endocrine fluctuations and associated metabolism. Autonomic nervous system (ANS) activity may be altered in the phases of menstrual cycle. Heart Rate Variability analysis has become an important tool in cardiology, because its measurements are non – invasive and easy to perform, have good reproducibility and provide prognostic information about coronary heart disease (CHD). Heart rate variability (HRV) in women has been related independently to endogenous sex hormones, hormone replacement therapy, menopause, menstrual cycle, body mass index (BMI) & physical conditioning. The sympathetic & parasympathetic branches of the autonomic nervous system (ANS) regulate the activity of the sinoatrial node, the cardiac pacemaker. The beat – to – beat variation in heart rate therefore reflects the time varying influence of the ANS & its components on cardiac function.

**Aim:**The aim of this study was to correlate the BMI with cardiac autonomic activity in the different phases of menstrual cycle using Heart rate variability.

**Materials and Methods:**Total of 30 healthy older adult females belonging to age group of 25 – 45 years were selected. Selected subjects were divided into 2 groups, Group I (BMI < 20) and Group II (BMI >20). The ECG recordings were taken during the follicular and luteal phases of menstrual cycle and were analysed by HRV software. The time domain and frequency domain analysis was done. The results will be discussed at the time of presentation.

**Key words:**BMI, cardiac autonomic activity, menstrual cycle

**Corresponding address:** Bhagyashree N, Email: bhagyashivanugraha@gmail.com

## **A Retrospective study of Antimicrobial Resistance in a Tertiary Care Hospital [K.R.Hospital] Mysore.**

**BhanuPriya B, Dr.Basavanna P L.**

Mysore Medical College and Research Institute, Irwin road, Mysore, 570001

P61

**Objective Of the Study:** To analyse the pattern of anti-microbial resistance among the patients in a tertiary care hospital.

**Materials and Methods:** A retrospective, observational study is conducted in the Department of Microbiology in K.R.Hospital, Mysore.The present study is designed to analyze the clinical profile and antimicrobial resistance pattern among the culture positive cases admitted in various wards of our hospital and the patients attending the out-patient department. The parameters studied among these patients are– Patient's demographics, Nature

of specimens, Bacterial isolates and Antimicrobial resistance. The information will be collected from the hospital records.

**Results:** The study is ongoing and the results obtained will be analyzed using the descriptive statistical methods.

**Corresponding address:** Dr. BHANU PRIYA B; 2<sup>nd</sup> year postgraduate, Department of Pharmacology, MMC&RI, Mysore; ADDRESS: #61, Old block, MMC&RI Interns and PG'S Ladies Hostel, Opposite Nanjaraja Bahadur Choultry, Vinobha road, Mysore – 570005. Email id: bhanupriya0701@gmail.com

## **A study of lipid profile and highly sensitive C Reactive Protein (hsCRP) among prehypertensive and normal subjects.**

P62

**Bharath T, Roopakala M S**

Dept of Physiology, Malabar Medical College & Research Centre, Modakkallur, Atholi, Calicut.

**Background:** Prehypertensives have a greater risk of developing hypertension than those with lower blood pressure (BP) levels. Studies have shown increased levels of high sensitivity C-reactive protein (hsCRP) and dyslipidemia in patients suffering with hypertension as compared to normals. But, not much is documented about the levels of these parameters in prehypertensives.

**Aim:** Present study is undertaken with the aim to compare the levels of serum hsCRP and lipid profile among prehypertensives and normal subjects and to study the correlation of BP with hsCRP and lipid profile.

**Methods:** Forty prehypertensive and forty age and BMI matched normotensive subjects, aged between 20 and 40 years, were recruited. Anthropometric measurements; and BP values were recorded and classified as per JNC 7 criteria. Serum hsCRP and lipid profile were measured; and compared using student t test. Correlation of BP with hsCRP and lipid profile was done using Pearson correlation.

**Results:** Serum hsCRP showed no significant difference between prehypertensives ( $1.49 \pm 0.49$  mg/L) and normals ( $1.21 \pm 0.19$  mg/L) ( $p = 0.348$ ). There was no significant correlation of Systolic BP (Prehypertensives  $r = -0.037$ ,  $p = 0.819$ ; Normals  $r = -0.045$ ,  $p = 0.781$ ) and Diastolic BP (Prehypertensives  $r = 0.139$ ,  $p = 0.391$ ; Normals  $r = -0.011$ ,  $p = 0.085$ ) with hsCRP in both the groups. Total cholesterol (TC) and Low Density Lipoprotein (LDL) were significantly increased ( $p < 0.001$ ) in prehypertensives (TC  $168.11 \pm 36.14$  mg/dL; LDL  $92.77 \pm 35.35$  mg/dL) as compared to normals (TC  $131.79 \pm 21.67$  mg/dL; LDL  $58.59 \pm 24.46$  mg/dL). There was no significant association between BP and lipid parameters in prehypertensives.

**Conclusions:** There is no significant difference in hsCRP levels between prehypertensives and normals. There is a significant increase of TC and LDL in prehypertensives as compared to normals. Lipid profile is altered in prehypertensives.

**Corresponding address:** Dr Bharath T, Asst Professor, Dept of Physiology, Malabar Medical College & Research Centre, Modakkallur, Atholi, Calicut-673315. Mob: 09745783824/ 09972314824; E mail: drbharath.t@gmail.com

## The diagnostic value of Semmes Weinstein monofilament as a measure of peripheral neuropathy in type 2 diabetes mellitus

P63

Bharathi C<sup>1</sup>, Roopakala M S<sup>1</sup>, Shivaprasad C<sup>2</sup>, Acharya P T<sup>3</sup>

<sup>1</sup>Department of Physiology, <sup>2</sup>Department of Endocrinology, <sup>3</sup>Department of Neurology, M S Ramaiah Medical College, Bangalore

**Objective:** To evaluate validity of Semmes Weinstein monofilament (SWMF) in diagnosing peripheral neuropathy in Type 2 Diabetes Mellitus considering Nerve Conduction Studies (NCS) as gold standard.

**Methods:** Thirty patients in the age group of 40 to 60 years with established diabetic neuropathy, diagnosed by NCS were selected as cases. Thirty age and sex matched healthy adults who had normal NCS were selected as controls. Conventional sensory and motor nerve conduction studies were measured in all subjects. Semmes Weinstein monofilament was tested in all cases and controls for both feet on eight areas. Response was recorded.

**Result:** Sensitivity was found to be 50%, Specificity was 73.3%, Positive and negative predictive value of 65.21% and 59.45% respectively.

**Conclusion:** The SWMF test has a poor validity comparable to that of NCS for the diagnosis of diabetic neuropathy. Its diagnostic value may be increased when combined with other screening modalities.

**Corresponding address:** Dr Bharathi C, <sup>1</sup>Department of Physiology, M S Ramaiah Medical College, Bangalore, E-mail: bharathi\_sathis@yahoo.in

## Question-writing: a student-centred approach to enhancing learning.

P64

Bharati Mehta, Bharti Bhandari Om Lata Bhagat, Sabyasachi Sircar, Sneha Ambwani

**Aims & Objectives :** The study was designed to reinforce learning in medical undergraduates. To ingrain communication & analytical skills in them.

**Method:** The study was performed in the Department of Physiology, AIIMS, Jodhpur on 100 first semester medical students. Didactic lectures on Haematology were delivered to them and then the students were asked to prepare small questions on the topic. To add to their interest, they were divided into two groups that were made to ask questions to each other. Ninety nine students participated in this activity. Data was then obtained by getting feedback of the students on a ten item questionnaire.

**Result:** The average rating of all the ten items in the questionnaires using a five-point Likert scale (where 5 is strongly agree and 1 is strongly disagree ) came out to be 4. On total scoring of each student, the minimum score obtained was 26 and the maximum was full 50 with only 5 students scoring 30 or less.

**Conclusion:** For drafting questions, the students went through the whole system in a comprehensive manner and made questions from every possible aspect of the topic. Some of the questions (30%) were of recall type but most judged cognitive, affective or psychomotor domains. This fun-filled lively free-hearted discussion ingrained communication and analytical skills in them. It helped us in creating a question bank as well.

**Correspondence Author:** Dr. Bharati Mehta, Associate Professor, Deptt. of Physiology; All India Institute of medical Sciences, Jodhpur. Email: drbharati2005@yahoo.com

## Oxidative Stress in Primary Hypothyroidism and protective role of Ascorbic Acid (Vitamin C)

P65

**Bharti Bhandari, Bharati Mehta, Purnima Sharma, Om Lata Bhagat, Sabyasachi Sircar, Department of Physiology, AIIMS, Jodhpur.**

**Aims & Objectives:** (i) Assessment of oxidative stress by Thiobarbituric acid reactive substance (TBRS) level in patients with primary hypothyroidism. (ii) To investigate the protective role of Ascorbic acid.

**Methods:** The study comprised of 30 subjects in the age group 20-40 years of either sex divided as follows: Group 1: Healthy young adults i.e. controls; Group 2: Newly diagnosed cases of Primary Hypothyroidism + Hormone Replacement Therapy (HRT); Group 3: Newly diagnosed cases of Primary Hypothyroidism + HRT + Ascorbic acid (1000 mg/day).

**Results:** Hypothyroids had significantly lower levels of  $T_3$ ,  $T_4$  and higher levels of TSH and significantly deranged lipid profile as compared to controls. Significantly higher TBRS and lower Ascorbic acid levels were observed in hypothyroids. Following 6 months of HRT, thyroid as well as lipid profile in both the groups (2 and 3) returned to normal. TBRS and Vitamin C level did not revert to values in Group 2. In group 3, significant decrease in TBRS and increase in Vitamin C level was seen. No adverse effects of Ascorbic acid were observed during the study.

**Conclusion:** Lower Vitamin C concentration and increased TBRS in hypothyroidism indicates state of oxidative stress and imbalance between anti-oxidant and pro-oxidant mechanisms in the body. In hypothyroidism, along with HRT, anti oxidants like Ascorbic acid may be recommended.

**Corresponding Author:** Dr Bharti Bhandari, Assistant Professor, Dept. of Physiology, AIIMS, Jodhpur (Rajasthan), Email: drbhartibhandari@yahoo.co.in or bhandarib@aiimsjodhpur.edu.in

## Effect of essential hypertension on various cognitive domains.

P66

**Bhete Deepa B, Venkatraman Brinda.**

Dept. of Physiology, TNMC & BYL Nair Ch. Hospital, Mumbai Central 400008.

**Aims:** Assessment of effect of essential hypertension on cognitive domains by using various neurocognitive tests battery.

**Objective:** To compare average values of neurocognitive tests of hypertensive subjects with healthy normotensive subjects.

**Method:** 100 subjects with uncomplicated essential hypertension and 100 normotensive control subjects with similar educational level and age (30 to 50 years) were assessed, in tertiary care hospital mumbai. An extensive neurocognitive tests battery was administrated to measure attention, concentration, judgement, psychomotor speed, memory and learning. Unpaired 't-test' was used for analysis.

**Results:** There was statistically significant difference ( $p < 0.0001$ ) is found in hypertensive group for 5 tests like - digit symbol test, digit span forward test, logical short stories test and choice auditory and visual reaction time when compared to subjects in comparison group.

**Conclusion:** The findings from this study suggest that essential hypertension produces deleterious effects on various cognitive functions or domains, especially within the domains of attention, memory and executive functioning. Which appear to be functional and possibly reversible rather than structural and progressive.

**Corresponding address:** Bhete Deepa B, Dept. of Physiology, TNMC & BYL Nair Ch. Hospital, Mumbai Central 400008. Email ID: deepa.bhete28@gmail.com

### **Assessment of Moberg's test of dominant and non-dominant hand in visually blind versus visually normal participants.**

P67

**Bhirange Swapnil S., Pillai Chitra**

Dept. Of Physiology, TNMC & BYL Nair Ch. Hospital, Mumbai Central-400008.

**Aims:** Comparative analysis of Moberg's test in blind versus normal participants.

**Objective:** To compare average values of time taken in Moberg's test of dominant and non-dominant in visually blind with normal participants.

**Methods:** 50 blind participants & 50 normal participants from various colleges in Mumbai were assessed. Detailed history about onset of blindness, motor dominance etc. of blind was asked. Moberg's test was done using assortment of everyday objects, the number and nature of which are determined by the examiner, is placed on a table in front of the participants, who were instructed to pick them up one at a time, as fast as possible, and place them into a box using his or her involved hand. Normal subject were blindfolded before starting test. Unpaired t-test was used for analysis.

**Results:** Average values of time taken in Moberg's test of dominant hand & non-dominant hand of visually blind participants were significantly lower compared to those of visually normal participants ( $p < 0.01$ ).

**Conclusion:** Thus we conclude that in absence of visual stimuli sensorymotor system in blind is improved compared to normal blindfolded subject. This can be due to increased sensitivity to the tactile stimuli & increased ability to perceive constant touch (to locate) and improved spatial orientation because of cross-modal synaptic plasticity.

**Corresponding address:** Bhirange Swapnil S., Dept. Of Physiology, TNMC & BYL Nair Ch. Hospital, Mumbai Central-400008. Email ID :-swapnilbhirange3@gmail.com

### **Commonest opportunistic infections in HIV positive individuals and its correlation to CD4 count: a retrospective study in Sikkim**

P68

**Bina Basnett, D.K.Jha**

Department of physiology, Sikkim Manipal Institute of Medical Sciences, 5<sup>th</sup> mile Tadong, East Sikkim, 737102

**Aims and objectives:** To find out the commonest opportunistic infection in Sikkim amongst HIV infected individual and its correlation to CD4 count.

**Methods:** The study was carried out at antiretroviral therapy (ART) center in Sikkim State AIDS Control Society (SSACS), Gangtok. After taking permission from the project director, SSACS, a retrospective data analysis was done from the registers maintained at ART for the year 2012-2013, where the names of the patient was not disclosed rather unique identity numbers were given for those who visited ART for opportunistic infections and it was correlated with the CD4 count using the patients CD4 record file.

**Results:** 79 patients had reported with OI's, amongst which 26 had extra pulmonary tuberculosis, (EPTB) hence, EPTB was found to be the commonest OI associated with falling CD4 count.

**Conclusion:** Unlike in most other parts of India where pulmonary Tuberculosis is one of the commonest manifestations in Sikkim EPTB is the predominant OI associated with falling CD4 count.

**Corresponding address:** Bina Basnett, Department of physiology, Sikkim Manipal Institute of Medical Sciences, 5<sup>th</sup> mile Tadong, East Sikkim, 737102, Email: bina\_basnett@hotmail.com

## Respiratory burst activity of neutrophils is reduced in patients with hypothyroidism

**Bindu Mohan, Komaladevi S.D**

P69

VIMS & RC, Bangalore ; Email- drbindu0509y2k@hotmail.com; #17 / 11 Ali Asker Cross Road, Cunningham Road, Bangalore 560052.

**Aim** - To assess the neutrophil function in patients with hypothyroidism

**Objective** - To evaluate the relation between TSH levels and respiratory burst functions in patients with hypothyroidism and normal individuals.

**Method** –After taking consent blood samples from adult patients (mostly female) in the age group of 19 – 50 yrs is taken and Nitro blue tetrazolium test is performed to test the neutrophil respiratory burst activity. The cells are exposed to yellow dye nitro blue tetrazolium. Stimulated cells, take the dye into phagosomes and intracellular reduction converts it into insoluble, blue crystals. These crystals are visible in the light microscope and can be counted. The test gives information about both phagocytic and metabolic function of Neutrophils.

**Results –Controls** - mean value for NBT (stimulated) was  $61.91 \pm 10.38$  and mean for NBT (unstimulated) was  $46.2 \pm 9.4$ . **Hypothyroid cases** mean value for NBT (stimulated) was  $48.83 \pm 11.02$  and mean value for unstimulated NBT was  $42 \pm 13.06$  ; The NBT test was significantly less in Hypothyroid patients compared to normal.

**Conclusion** – Respiratory burst activity appears to be reduced in hypothyroid patients. Hence this may be one of the causes for reduced immunity in hypothyroid patients. Further study is required in this area.

**Corresponding Address:** Bindu Mohan, VIMS & RC, Bangalore; Email- drbindu0509y2k@hotmail.com; #17/11 Ali Asker Cross Road, Cunningham Road, Bangalore 560052.

## Assessment of physiological cardio respiratory parameters during submaximal exercise on sub-acute exposure to hypoxia in healthy young Indian males

**Bipin K Shrestha, SP Singh, VK Malhotra, Anuj Chaula**

P70

**Aims:** To assess changes in Cardio Respiratory parameters during Submaximal Exercise on sub-acute exposure to High altitude in healthy young Indian males

**Objectives:** To estimate changes in SBP, DBP, HR, RR and Lactate Level at Near Sea Level (NSL) and at Simulated altitude (3000meters) at rest and during sub-maximal exercise.

**Methods:** 11 healthy male volunteers, Age (18-35yrs) performed graded incremental submaximal exercise on Bicycle Ergometer at NSL and after 4 hours of sub-acute exposure to normobaric hypoxia equivalent to 3000m altitude. Cardio Respiratory parameters were measured at Rest and During Exercise in both the conditions.



**Results:** Mean Resting values at NSL and hypoxic chamber were: SBP(127±6vs132±5mmHg), DBP(70±3vs78±6mmHg), HR(72±5vs80±6bpm), RR(25±4vs29±3/min) and LL(2.1±0.35vs2.5±0.42mmol/l). Similarly, mean values at the end of last stage were: SBP(152±9vs169±13mmHg), DBP(83±6vs92±6mmHg), HR(134±12vs155±7bpm),RR(35±6vs51±6/min) and LL(7.11±0.89vs8.01±1.03mmol/l).

**Conclusion:** A significant difference exists in mean resting values of SBP, DBP, HR, RR and Lactate Level at NSL and on sub-acute exposure to Normobaric Hypoxia. Sub-maximal exercise in hypoxic conditions appears to depend more on anaerobic metabolism and results in greater sympathetic activity.

**Corresponding address:**Bipin K Shrestha; Department of Physiology Armed Forces Medical College, Pune-40 (Maharashtra); Fax Number: 020 26331580; Email: bips\_2012@hotmail.com

## Age related variations in pulmonary function testing in flour mill workers- a cross sectional study

P71

Bishara P Pushkar

**Aim:** To study age related changes in PFT in flour mill workers

**Objectives:** (1) To assess the PFT results in flour mill workers;(2) To classify the age related variation in spirometric parameters (3) To evaluate statistically the findings, (4) To suggest remedial methods to compensate for adverse effects if found.

**Materials and Methods: Study design-**Cross Sectional Study, **Study period-** 3 months

**Study population** Mill workers ,**Sample size-**79 subjects.**Parameters studied:** FVC, FEV<sub>1</sub>, FEV<sub>1</sub>/FVC, PEF, FEF<sub>25-</sub>

**Inclusion criteria:** Male non smokers aged between 20-55 years working for >1 year.**Exclusion criteria:** Subjects with abnormalities of vertebral column, thoracic cage, neuromuscular diseases, gross anaemia, diabetes mellitus, chronic bronchitis, emphysema, bronchial asthma, tuberculosis, ischemic heart diseases, who had undergone recent surgeries.

**Study procedure:** Study was done using portable spirometer. 3 subjects were assessed in a day after repeated tutoring and trials. Statistical analysis was done using regression model.

**Result:** The statistical work is in progress. However there are pointers towards significant findings suggestive of age related changes in the parameters.

## Comparative study of senile dementia in people doing exercise and sedentary life style above 60 yrs of age

P72

Charulata Kadam, V.G. Aundhakar and T. B. Bhutada

Department of Physiology, Govt. Medical College, Miraj; dist: Sangali. Maharashtra

**Aim:** To compare the Senile Dementia in people doing exercise & sedentary life style above 60 years of age.

**Background:** Dementia is syndrome of symptoms such as memory loss & decrease in ability to handle the daily functions of life. Normal aging can cause some minor changes in memory or learning, but not in a way that affects functioning. This study is to find out the prevalence of senile dementia in sedentary an exercise groups.

**Objectives:** To find out difference in senile dementia between exercise doing and sedentary life style geriatrics age groups.

**Materials and methods:** In this study, 300 old age persons among these 150 sedentary & 150 doing exercise were invited to participate voluntarily. They were given MMSE & Clock Drawing Test.

**Results:** Among 300 persons; 150 in sedentary as well as exercise doing persons. Mean age, 72.3 years of age. Based on MMSE score among sedentary group 72% were positive & Clock Drawing Test score 74.66% were positive for dementia. Based on MMSE score among exercise group 45.34% were positive & Clock Drawing Test score 42.66% were positive for dementia.

**Conclusion:** In present study, there was high prevalence of dementia in sedentary life style persons than persons doing exercise. Results add further weight to the idea that regular exercise can help keep the mind alert and lower the risk of cognitive problems like senile dementia as compared to sedentary group.

## Cement Dust and Pulmonary functions: A Comparative Study

P73

**Clevin Rashmi Rebello**

Department of Physiology, Kannur Medical College, Anjarakandy post, Kannur, Kerala

**Aim:** To record and compare the pulmonary functions among the subjects exposed to cement dust directly with that of non exposed subjects taken from general population of Bagalkot.

**Objectives:** 1) To record the pulmonary functions (FVC, FEV<sub>1</sub>, FEV<sub>1</sub>/FVC, PEF, FEF<sub>25-75%</sub>) among the subjects exposed to cement dust directly in the cement factory and among the unexposed controls taken from the general population of Bagalkot. 2) To compare the pulmonary functions (FVC, FEV<sub>1</sub>, FEV<sub>1</sub>/FVC, PEF, FEF<sub>25-75%</sub>) between the exposed and unexposed groups and hence study the risks associated with cement dust exposure.

**Methods:** A total of 132 apparently healthy age and sex matched subjects 66 cement factory workers who were directly exposed to cement dust and 66 subjects from general population of Bagalkot were selected. Forced expiratory spirometry was recorded by Helios 401 hand held portable computerized spirometer [M/s Recorders & Medicare Systems Ltd. India]. Parameters such as Forced Vital Capacity [FVC], Forced Expiratory Volume in 1<sup>st</sup> second [FEV<sub>1</sub>], the ratio of FEV<sub>1</sub>/FVC, Forced Expiratory Flow in the middle half of FVC [FEF<sub>25-75%</sub>] and Peak Expiratory Flow Rate [PEFR] were assessed and statistically analysed using students 't' test and ANOVA.

**Result:** Statistically significant reduction in FVC, FEV<sub>1</sub>, and PEF was found in exposed workers as compared to the non-exposed. Although FEV<sub>1</sub>/FVC ratio and FEF<sub>25-75%</sub> was less in exposed workers, the difference was found to be insignificant.

**Conclusion:** Our results suggest that factory workers within few years of cement dust exposure develop reduction in pulmonary functions which indicates airway obstruction and these effects worsen on continued exposure. Effect of exposure to automobile exhaust on the pulmonary function test in traffic policemen in Goa.

**Corresponding Address:** Assistant Professor, Department of Physiology, Kannur Medical College, Anjarakandy post, Kannur-670612, Kerala; 09746610892; Email: drcrashmi@yahoo.com

## Optimal duration and reliability of water immersion finger wrinkling (WISW) test in healthy Indian subjects.

P74

Deepa CNA<sup>1</sup>, Sucharita S<sup>1</sup>, Coleman T<sup>2</sup>, Rajanna S<sup>2</sup>, Avadhany ST<sup>1</sup>

<sup>1</sup>Department of Physiology; St John's Medical College; Bangalore-34; <sup>2</sup>Alcorn State University, Missisipi, United States of America

**BACKGROUND:** WISW test is a simple test that can be used for evaluation of sudomotor sympathetic nervous system. It is of paramount importance to validate such tests which are simple, inexpensive and noninvasive to evaluate autonomic nervous system.

**Objectives:** To determine (i) Optimal duration and reliability of WISW test. (ii) To improve end point assessment of wrinkles by wet finger prints obtained on smoked paper.

**Methodology:** 62 subjects between the age group of 18 to 60 years were recruited. All the participants underwent WISW test. The scores were obtained prior to water immersion, 5, 15 and 30 minutes post immersion by three different observers. The finger prints were also captured on smoked paper as an attempt to improvise end point assessment.

**Results:** The maximal wrinkling scores ( $10.4 \pm 5$ ,  $p < 0.01$ ) was obtained at 15 minutes of immersion. The means obtained by three observers ( $9.84 \pm 5.06$ ,  $9.47 \pm 5.36$ ,  $9.66 \pm 5.98$ ) were not different. There was an agreement between the two methods of end point quantification of water immersion skin wrinkling namely manual counting vs. counting of wrinkles from finger prints obtained in smoked paper.

**Conclusion:** WISW test is reliable. The optimal duration of water immersion required is 15 minutes. Counting of wrinkles from finger prints could be an alternative to manual counting of wrinkles.

**Corresponding address:** Deepa CNA, Department of Physiology; St John's Medical College; Bangalore-34

## A comparative study of visual reaction time in table tennis players and age matched healthy controls

P75

Deepa H S, Nagaraja S, Suresh Y Bondade

**Aim & Objectives:** Reaction time is a good indicator of performance in sports. The purpose of this study was to compare visual reaction time (VRT) in 30 table tennis players and 30 age matched healthy controls.

**Methods: Age group:** 18-30 years of male table tennis players and age matched male healthy controls. **VRT Measurement:** Examiner presses the START button in first component which was out of the view of the subject. Subject was instructed to press the STOP button in second component as soon as he sees the light in the instrument. Reaction time was recorded for red, green & blue light in msec using Audacity software. Minimum five trials were given. Minimum time recorded disallowed as final VRT. The results were analysed statistically using students unpaired 't' test.

**Results:** Mean age of 30 table tennis players was 21.8 years and 30 controls was 21.2 years. Mean values of VRT in table tennis players was faster than healthy controls for red, green & blue colours & the difference was statistically significant ( $p < 0.05$ ).

**Conclusion:** Present study results support the view that playing table tennis is beneficial to visual reaction time, improve the concentration and alertness.

**Corresponding address:** Dr. Deepa H S, II year Post graduate in Physiology, Department of Physiology, JJM Medical College, Davanagere, Karnataka -577004, Email: dr.deepa.sh@gmail.com

### **Student's opinion on the present teaching methods in pharmacology and the importance of pharmacology in clinical practice, in a government medical college**

P76

**Deepak.T.S, Parashivamurthy.B.M, Arvind.K.**

Department of Pharmacology, Mysore Medical College and Research Institute, Irwin road, Mysore-570001.

**Objectives of the study:** (a) To collect opinion regarding the present teaching methods in pharmacology and modifications needed. (b) To evaluate the student's knowledge regarding the importance of pharmacology in clinical practice.

**Materials And Methods:** A questionnaire based cross sectional study was conducted in Mysore Medical College and Research Institute, Mysore. MBBS Students of 5<sup>th</sup> term to 9<sup>th</sup> term who come under the inclusion criteria were asked to answer the questionnaire after taking informed consent. The data collected in this study will be analyzed using descriptive statistics using SPSS for windows.

**RESULTS:** The study is ongoing and the results will be available within two weeks.

**Corresponding Address:** Dr. Deepak.T.S, PG in Pharmacology, Department of Pharmacology, Mysore Medical College and Research Institute, Irwin road, Mysore-570001. PHONE NO: 9900971447 E-MAIL: deepak.ts123@gmail.com

### **Duration of swimming practice has differential effect on airway caliber and muscular efficiency**

P77

**Deepali A, Ravindra P.N\*, Shobha M.V, Pralay Mujumdar#, MandalM#**

**Aims:** Swimming, by increasing the airway caliber and muscular efficiency brings about enhanced pulmonary function. However, the effect of duration of swimming practice on these effects is sparsely evaluated and the present study attempts to address this aspect.

**Methods:** Pulmonary function test was conducted among healthy male (20-30 years) volunteers who were regular swimmers (n=51) and was compared with controls (n=51) who practiced athletic events but not swimming.

**Results:** Swimmers (23.52 ± 1.87 years) were significantly younger than controls (24.39 ± 2.22 years) with 5.33 ± 1.82 years of swimming practice. Swimmers exhibited increased VC, FVC, FEV<sub>1</sub>, PEF, MEF25%, MEF50%, MEF25/75% than controls. Swimmers demonstrated a significant positive correlation between duration of swimming practice and airway caliber (FEV<sub>1</sub>, MEF25%, MEF50%, MEF25/75%), whereas, muscular efficiency (VC and PEF) did not demonstrate any correlation. This demonstrates that, airway modulation takes place proportionately with duration of swimming practice. Contrary, muscle efficiency did not show such behaviour, thereby; a ceiling effect on skeletal muscle efficiency could be expected with prolonged duration of swimming practice.

**Conclusions:** Prolonged swimming practice brings about improved respiratory functions by bringing about airway modulation rather than by skeletal muscle efficiency.

**Key words:** Swimming, Pulmonary function, airway caliber, skeletal muscle efficiency

Corresponding address: Dr. Ravindra P.N, Associate Professor, Department of Physiology, Sri Siddhartha Medical College and Hospital, Agalakote, B.H.Road, Tumkur, Karnataka - 572107 Ph-09448934488; Email - ravindrapinna@gmail.com

## Understanding the physiological mechanisms of cancer cachexia

P78

Deepika Chandrasekaran\*, M. Semmal\*\*

Department of Physiology, Sri Ramachandra Medical College and Research Institute, Porur, Chennai

### Abstract

Carcinoma is the second leading cause of death worldwide, with 50 percent of it being associated Cachexia which is progressive atrophy of adipose tissue and skeletal muscle resulting in extreme loss of body weight, lower Neuropeptide Y levels; reduced quality of life and short survival. Anorexia often accompanies cachexia, the former deals with fat loss and the latter is equal loss of fat and muscle. Loss of adipose tissue in cachexic patients is due to increased lipolysis triggered by inflammatory cytokines and mediated by epinephrine, glucagon and adrenocorticotrophic hormones through cAMP. Adipocytes show increased response to natriuretic peptide, these changes leads to rapid weight loss. Studies suggest that these changes are due to lipid mobilizing substances in circulation crafted by the host or tumor.

In skeletal muscle the protein degradation occurs by (1) Lysosomal system (2) Calcium activated system and the (3) Ubiquitin protease pathway unfortunately upregulated by the glucocorticoids. Calcium plays a role in glucocorticoid induced proteolysis resulting in imbalance of calpain-to-calpastatin ratio. TNF- $\alpha$  along with IL-6 enhance the protein degradation.

The early attempts of treatment are calorie supplementation or appetite stimulants. Ghrelin on continuous infusion increases food consumption and thereby gain in weight. Eicosapentaenoic acid combined with protein supplement stimulates protein synthesis. Non steroidal anti-inflammatory agents prolonged the mean survival time in cancer patients.

## To measure heart rate variability parameters in patients of depression

P79

Deepti Jangpangi, Sunita Mondal, Rajiv Bandhu, Dinesh Kataria, Jayshree Bhattacharjee, Asha Gandhi.

Department of Physiology, Lady Hardinge Medical College, New Delhi

**Objective:** Depression is commonly associated with greater cardiovascular morbidity and mortality. Autonomic imbalance might be responsible as an underlying mechanism. The objective of our study is to measure heart rate variability in depressive patients.

**Method:** Thirty drug naive patients in the age group of 20 to 45 years of either gender, attending the OPD of psychiatry, LHMC & SSKH, diagnosed according to ICD-10 guidelines were included in the study. Patients suffering from any other psychiatric disorders or any known physical illnesses were excluded. They were compared with thirty apparently healthy age and gender matched controls. BMI ( $\text{kg}/\text{m}^2$ ), educational and socioeconomic status was matched. Five minute segment basal recording was taken between 9am and 12 noon to obviate any diurnal influences and data analyzed to obtain the time domain and frequency domain parameters of heart rate variability.

**Results:** The frequency domain parameters that is LF (nu) ( $p < 0.001$ ), LF:HF ratio ( $p < 0.001$ ) were significantly higher in depression group, whereas HF (nu) parameter was significantly lower ( $p < 0.001$ ) in depression group

as compared to control group. No significant difference was observed in time domain parameters (SDNN and RMSSD) in between the two groups.

**Conclusion:** The present study depicts that depression is associated with autonomic imbalance with relative dominance of sympathetic nervous system as compared to parasympathetic nervous system. This might contribute to increased morbidity due to cardiovascular diseases in depressive patients.

**Corresponding address:** Deepti Jangpangi, Department of Physiology, Lady Hardinge Medical College, New Delhi E mail: drdeeptijangpangi@gmail.com

### Impact of disturbed circadian rhythm in call centre workers.

P80

**Devendra Manohar Patil<sup>1\*</sup>, Rima Patil<sup>2</sup>, Satish Mali<sup>3</sup>, Vrinda Dalvi<sup>1</sup>**

<sup>1</sup> Department of Physiology, K. J. Somaiya Medical College & Research Centre, Sion, Mumbai, Maharashtra.<sup>2</sup>, Ayurved Mahavidyalaya, Sion, Mumbai.<sup>3</sup> Department of Preventive and Social Medicine, K. J. Somaiya Medical College & Research Centre, Sion, Mumbai, Maharashtra.

**Aims and Objectives:** the present study was undertaken to investigate the clinico-pathological impact of disturbed circadian rhythm in call centre workers.

**Methods:** 100 call centre workers (24-34 yrs) working for the minimum of three consecutive months in night shifts were compared with 100 subjects involved in day shifts. Informed, written consent was taken from all the participants. Epworth Sleepiness Scale (ESS) was used for the assessment of sleep.

**Results:** The data was expressed as Mean  $\pm$  S.D and analyzed using SPSS-16 software. Un-paired 't' test was used for comparison between two groups. The difference in the mean of Epworth Sleepiness Scale (ESS) between the study and control group was statistically significant ( $P < 0.05$ ).

**Conclusion:** Sleep being an integral part of human life plays an important role in promotion of health and prevention of diseases. The disturbance of circadian rhythm in call centre workers is due to the effect of not getting enough sleep; an excessive sleep debt causes mental, emotional and physical fatigue.

**Key-words:** Circadian Rhythm, Epworth Sleepiness Scale, Sleep Debt.

### A study of central and peripheral neuropathy in early type-2 diabetic patients of SMIMS, Kulasekharam

P81

**Devi S, Kumarisheela MS, Aswathy L, Mythilibai K.**

Department of physiology, Sree Mookambika Medical Sciences, Kulasekharam.

**Aims and Objectives:** Type-2 diabetes is one of the most serious challenges to healthcare and Neuropathy is one of its most common complications. This study aims to evaluate the prevalence of both central and peripheral neuropathy and to find out the gender difference in type-2 diabetic patients of less than 3 years duration.

**Methods:** This cross sectional study was conducted in 30 early diabetic out patients with 45-60 years of age. They were divided into 2 groups, 15 males and 15 females. After detailed history and clinical examination, peripheral sensory conduction through the median nerve and central visual evoked potential were tested by RMS neuropack. Results were analysed using chi-square tests.

**Results:** In the present study, there was significant increase in latencies of both sensory median and visual evoked potential ( $p < 0.05$ ). The prevalence of peripheral neuropathy is 73% and central neuropathy is 60%. There was no significant gender difference in neuropathy manifestation.

**Conclusion:** Diabetes mellitus affects both central and peripheral nervous system much early before the disease gets manifested and this subclinical neuropathy can be detected early with nerve conduction study.

**Corresponding address:** Devi S, Department of physiology, Sree Mookambika Medical Sciences, Kulasekharam.

## Nootropic Effect of *Centella Asiatica* in White Wistar Rats based on Histological Studies

DEVI.N.P. and J K Mukkadan\*

P82

RESEARCH SCHOLAR, RESEARCH DIRECTOR\*, DEPT: PHYSIOLOGY; LITTLE FLOWER MEDICAL RESEARCH CENTRE, ANGAMALY

Learning is acquisition of the information that makes to alter the behavior of an organism, and memory is the retention and storage of that information. The two are closely related and should be considered together. Working memory areas are connected to the hippocampus and in humans the destruction of the hippocampus cause striking defects in short term memory. It is now established that the traditional view that brain cells are not added after birth is wrong, new neurons form from stem cells throughout the life in hippocampus. Treatment with nootropic drugs can enhance the learning and memory performance. Present investigation is to evaluate the nootropic effect of *Centella asiatica*. Three different age groups of rats (10,30 and 60 days old) were administered with *Centella asiatica* juice according to their body weight for 30 days. Animals were tested in radial arm maze to assess learning and memory performance. Histological studies were carried out using Sholl analysis. Dendritic arborization is found to be increased in terms of intersections and branching points in three groups when compare with the control. From the results it is concluded that treatment with *Centella asiatica* can influence the neuronal morphology and can promote higher brain function in mice.

Key words: Learning, Memory, *Centella asiatica*, Hippocampal neurons, Dendritic arborization

## Assessment of Podcasts as a supplementary teaching and learning aid for dental students

Dhiren Punja, Shivananda Kalludi, Kirtana M Pai, Murali Dhar

P83

**Aims and objectives:** 1. To assess the efficacy of audio podcasts as a supplementary teaching and learning aid for dental students; 2. To study students' attitudes towards audio podcasts and perceived utility of podcasts.

**Methods:** The participants were first-year dental students of Manipal. A Live lecture class was conducted for all the students ( $n=80$ ). The students were then divided randomly into two equal groups of 40 each. Group 1 students were given a study period with an opportunity to listen to a brief lecture podcast. This was followed by a MCQ test. Group 2 ( $n=40$ ) was given a brief study period without podcast followed by a test. The test was followed by a podcasting session. Following this both groups completed a feedback form

**Results:** Our analysis using SPSS software and independent sample t test revealed a significant difference ( $p = 0.000$ ) in the mean test score between the two groups.(Group 1 mean score - 7.95, Group 2 mean score - 6.05). Analysis of the feedback forms which used Likert type scaling statements showed a favourable response

**Conclusions:** Students benefited when podcasts were used to supplement live lectures and textbook content. Also, students showed a favourable attitude for podcasts .

**Corresponding address:** DhirenPunja, Assistant Professor, Department of Physiology; Kasturba Medical College, Manipal -576104, Fax: 918202570062, Email: dhirenpunja82@hotmail.com

### **Effect of coffee on blood pressure and electrocardiographic changes in nicotine users**

**Dileep Kumar Verma** \*<sup>1</sup>, **Pradeep Kumar**<sup>2</sup>, **Jagdish Narayan**<sup>3</sup>, **S Tiwari**<sup>4</sup>

P84

**Introduction:** Coffee is one of the most widely consumed beverages in the world. In spite of caffeine, it also contains several other biologically active components that may have either harmful or beneficial cardiovascular effects. Caffeine is widely consumed by people of all ages in India as well as many other countries. Ingestion of nicotine is well known factor to increase the risk of cardiovascular disease.

**Aims and Objectives:** Therefore the aims of our study was to see the acute effect of coffee on Blood pressure, Electrocardiographic changes and Heart rate in nicotine users.

**Methods:** The study was conducted on 120 volunteers aged 21-40 years and with body mass index (BMI) between 17.3-28.0 kg /m<sup>2</sup>. The subjects were divided into two groups: Control (n=40) and Study group (n=80).

**Observation and Results:** Our data suggests that increment in blood pressure, recorded in study group after coffee ingestion, was lesser than that of control group. Observation showed that there were no significant changes in diastolic blood pressure in any group while the mean arterial pressure was higher in both the groups following coffee ingestion. Ingestion of coffee also decreases the heart rate in both groups.

**Conclusion:** On the basis of our observations we concluded that less amount of coffee ingestion may not be harmful.

\***Corresponding author:** Dileep Kumar Verma, Associate Professor, Deptt of Physiology, KGMU Lucknow, India

### **Effect of 12 weeks of Pranayama training on tested basal physiological parameters in young, healthy volunteers**

**Dinesh T**<sup>1</sup>, **Gaur G S**<sup>2</sup>, **Sharma V K**<sup>2</sup>, **Bhavanani AB**<sup>3</sup>, **Harichandra Kumar KT**<sup>4</sup>

P85

Department of Physiology<sup>1</sup>, Vinayaka Missions Medical College, Karaikal. Department of Physiology<sup>2</sup>, Department of Biostatistics<sup>4</sup>, Jawaharlal Institute of Post Graduate Medical Education and Research, Puducherry - 6.

**Background:** Pranayamas are breathing techniques that exert profound physiological effects on pulmonary, cardiovascular and mental functions. Previous studies demonstrate that different types of pranayamas produce divergent physiological effects.

**Aim & Objective:** To study the effect of 12 weeks of pranayama training on the tested basal physiological parameters in healthy, young subjects

**Materials and methods:** Present study was conducted in Department of Physiology, JIPMER on 60 healthy volunteers. After getting informed, written consent, subjects were randomized into pranayama (n=30) and control groups (n=30). Supervised training was given to the pranayama group by a certified yoga instructor and they practiced nadishodhana, pranava and savitri pranayamas for 30 minutes/day, thrice/week for 12 weeks. Cardiorespiratory parameters including resting heart rate (HR), systolic blood pressure (SBP) and diastolic blood pressure (DBP) measured after 10 minutes of supine rest using digital BP monitor (Citizen- CH 432B, Japan) and respiratory rate (RR) were recorded before and after 12 weeks of study period.



**Results:** Pranayama training resulted in marginal decrease ( $P > 0.05$ ) in all basal cardiovascular parameters while RR decreased significantly ( $P < 0.01$ ) from  $17.66 \pm 1.2$  to  $16.86 \pm 0.92$ . On the other hand, there was a significant ( $P < 0.05$ ) increase in RR from  $17.23 \pm 1.22$  to  $18.33 \pm 1.81$  in the control group with no significant change ( $P > 0.05$ ) in resting cardiovascular parameters such as HR, SBP and DBP.

**Conclusion:** 12 weeks of pranayama training showed improvement in the tested basal physiological parameters with significant decrease in RR while it increased in control group. The RR depends on mental-emotional activity and this decrease in RR may be attributed to a calm and stable mind-emotion complex in our subjects. Hence we conclude that pranayama training is useful in reducing RR through psycho-somatic mechanisms and that this enhances the health and well being of young subjects.

**Corresponding address:** Dinesh T<sup>1</sup>, Department of Physiology<sup>1</sup>, Vinayaka Missions Medical College, Karaikal. Department of Physiology<sup>2</sup>, Department of Biostatistics<sup>4</sup>, Jawaharlal Institute of Post Graduate Medical Education and Research, Puducherry – 6. Center for Yoga Therapy, Education and Research<sup>3</sup>, Mahatma Gandhi Medical College and Research Institute, Puducherry.

## Effect of active learning methods on 1st year MBBS physiology students

P86

**Dipali Chatur**

Assistant Professor, Dept. of Physiology, PIMS(DU), RMC, Loni, Tahsil Rahata, District Ahmadnagar, State Maharashtra.

**Background:** In India, majority of medical teachers are using didactic lectures as mode of providing information. Students being passive learners are facing difficulties in knowledge gain and recall of information. "Active learning" means the process of engaging students in some activity that forces them to reflect upon ideas and how they are using those concepts. The focus of this research is to study the effect of active learning methods on first year MBBS students.

### Aim and Objectives:

1. To improve subject knowledge by using active learning methods.
2. To assess the satisfaction level of students with active learning methods.

**Methods:** The study was conducted in Department of Physiology, Pravara Institute of Medical Sciences (DU), Rural Medical College, Loni (BK). 66 students participated in the study. For a group of 33 students "Finger Signals" and "Pen grabbing" method were implemented as active learning methods. Perspective of students to active learning methods was assessed by feedback with five point 'Likert type' response scale. Improvement in learning was evaluated by MCQ test.

**Results:** 95% students strongly agreed that both Finger signals and Pen grabbing methods helps to gain knowledge and recall of facts. As whole active learning methods created interest and fun in learning. There was significant improvement in MCQ test score with active learning method ( $p$  value  $< 0.05$ ).

**Conclusions:** Active learning methods provide safe learning environment and helps students to learn with fun. Helps to gain subject knowledge and improve recall abilities.

**Corresponding address:** Dr. Dipali Chatur; Assistant Professor, Department of Physiology, PIMS(DU), RMC, Loni, Tahsil Rahata, District Ahmadnagar, State Maharashtra. Contact No. 9175633973, Email id: dipalichatur@gmail.com

## An electrophysiological evaluation of cardiac function in normal subjects and patients of acute myocardial infarction using Spatial Vectorcardiography.

P87

Dipanjan Ray<sup>1</sup>, Sandipan Hazra<sup>2</sup>, Abhilash Sengupta<sup>3</sup>, Kaushik Sarkar<sup>4</sup>, Damodar Prasad Goswami<sup>4</sup>, \*Arnab Sengupta<sup>1</sup>.

<sup>1</sup>Dept. of Physiology, Medical College, Kolkata. <sup>2</sup>Dept. of General Medicine, RG Kar Medical College, Calcutta. <sup>3</sup>Dept. of Electronic & Communication, Birla Institute of Technology, Mesra. <sup>4</sup>Dept. Mathematics & Electronic & Communication, Narula Institute of Technology

**Introduction:** Conventional ECG records the projection of three dimensional vectors on two dimensional planes, leading to loss of crucial spatial information. Vectorcardiography (VCG) being the representation of all the instantaneous vectors generated at the heart, drawn from a zero reference point according to the direction, magnitude and polarity, preserves spatial information.

**Aims:** To test spatial Vectorcardiography as a tool to evaluate cardiac electrophysiology in health and in disease.

**Objectives:** To evaluate and characterize normal electrophysiology of heart using the vectocardiography. To test whether the vecterocardiography is a prognostic parameter of acute myocardial infarction or not.

**Methods:** Diagnosed patient of acute myocardial infarction admitted in the ICCU of a tertiary center were followed up till the point of outcome (i.e. death/discharge). Serial VCG were constructed according to our developed protocol. Evolution of VCG pattern after AMI with time, were studied. Any significant change in the VCG pattern before and after any intervention (eg. Thrombolysis, CABG) were also evaluated. All the results were assessed in comparison to controls.

**Results:** The construction and analysis of VCG in patients with AMI suggest significant changes in VCG pattern with time and also with intervention.

**Conclusions:** VCG is apparently found to be an efficient prognostic tool for AMI. It can be utilized as a research tool to assess real time cardiac function in health and in disease states.

**Corresponding address:** Arnab Sengupta, Dept. of Physiology, Medical College, Kolkata, Email:arnabseng@gmail.com

## A comparative study of visual & auditory short term memory in children & to evaluate the rapidity & specificity of response of children to both visual & auditory inputs

P88

Dipti Bhatt

Asst. Prof. Dept. of Physiology, Pt. J.N.M. Medical College, Raipur (C.G.) Pin 492001, India

**Background & Objectives:** The process of retention and storage of any kind of information is known as Memory. In our study we are trying to find out which form of memory is accurate & can be recalled best; hence present study was conducted to compare the Visual & Auditory Short term memory (STM) in children & to evaluate the rapidity & specificity of response of children to both Visual & Auditory inputs (assessing Working memory status).

**Materials and Methods:** After appropriate consent from parents & school teachers; the study comprised of 100 (50 males, 50 females) Healthy Children aged 11-15 years of National Higher Secondary School, Raipur (C.G.). Children having infirmities (Visual or Auditory) were excluded. Reaction time for audiovisual exposures to recalling is noted.

**Results:** There is a strong difference between visual STM and auditory STM ( $p < 0.001$ ). The mean reaction time is more for long words than short words. Short words are remembered more accurately than long words. The memory task performance increases with age.

**Interpretation & Conclusion:** The visual STM have a longer and more accurate duration than auditory STM. STM and working memory plays an important role in the learning processes of school children.

**Corresponding address:** Dipti Bhatt, Asst. Prof. Dept. of Physiology, Pt. J.N.M. Medical College, Raipur (C.G.) Pin 492001, India, E-mail:- diptibhatt1600@yahoo.com

## Stress-induced changes in cognitive functions are modified by short-term meditation in overweight/obese subjects

P89

Dipti Magan, Manju Mehta\*, Raj Kumar Yadav.

Integral Health Clinic, Department of Physiology and \*Department of Psychiatry, All India Institute of Medical Sciences, New Delhi-110029.

**Objective:** To study the effect of short-term meditation on stress-induced changes in cognitive functions in overweight/obese subjects.

**Methods:** In this ongoing study, till now 14 subjects have been enrolled. Overweight/obese subjects underwent 2-weeks meditation program. The variables included Freiburg Mindfulness Inventory (FMI), Centre for Epidemiologic Studies for Depression scale (CESD), Controlled Oral Word Association Test (COWAT), Symbol Digit Modalities Test (SDMT), Computer adaptive n-back task and Forward/backward digit span (FDS/BDS) at Day 1 (Baseline) and at Day 14 (end-of-intervention). Electroencephalography (EEG) was done twice at each Day 1 and at Day 14 during cognitive tasks. For controls, ( $n=9$ ) the same parameters were recorded at Day 1 and Day 14 without intervention.

**Results:** Weight ( $p=0.043$ ) and BMI ( $p=0.042$ ) was significantly decreased. Freiburg Mindfulness Inventory scores ( $p=0.041$ ), COWAT scores ( $p=0.05$ ), SDMT scores ( $p=0.042$ ), CESD scores ( $p=0.02$ ) and FDS/BDS scores ( $p=0.042$ ) were significantly increased at Day 14 versus Day 1 for overweight/obese subjects. EEG recording showed that alpha absolute power ( $p=0.046$ ), theta absolute power ( $p<0.001$ ) and beta absolute power ( $p=0.045$ ) were significantly increased. Control subjects did not show any changes.

**Conclusions:** These observations suggest that a short-term meditation program may lead to improvement in different cognitive domains.

## Can practice of yoga influence thyroid or pulmonary function tests?

P90

Divya satheesh .T

**Aim** To study the effects of yoga on thyroid and pulmonary function tests of healthy volunteers

**Objectives**(1) To study the effects of regular yoga practice on thyroid function tests; (2) To study the effects of regular yoga practice on pulmonary function tests

**Materials and Methods: Study design-** Interventional Study, **Study period-** 1 year,

**Study population** - Volunteers practicing yoga, **Sample size-** 50 subjects, **Parameters studied:** Free  $T_3$ , Free  $T_4$ , TSH, FVC,  $FEV_1$ ,  $FEV_1 / FVC$ , PEF; **Inclusion criteria;** Healthy volunteers of both gender who come under the age group of 25 to 55 yrs., who regularly practice yoga for a minimum duration of 75 minutes per day ,for 41 days.

**Exclusion criteria:** (1) Subjects with any systemic or mental disease. (2) Subjects on any medications or addictions. (3) Subjects who cannot comply with the study duration.

**Study procedure:** Thyroid and Pulmonary functions are assessed before and after yoga practice. The results obtained are statistical analyzed using paired "t" test.

**Result:** Effects of yoga on Thyroid and pulmonary function tests will be analyzed statistically and will be discussed.

## **Assessment of fasting blood glucose level, lipid profile and phaseangle in overweight and normal weight adult healthy individuals .**

**Divya Srivastava\*<sup>1</sup>, Kiran Singh<sup>1</sup>, S Nagtilak<sup>2</sup>& Rajesh Misra<sup>1</sup>**

P91

Department of <sup>1</sup>Physiology & <sup>2</sup>Biochemistry, Subharti Medical College, Meerut

**Aims & Objectives:** Previous studies have shown the association of low phase angle tertiles with high fat mass and high blood glucose in obese subjects. This study is being conducted to compare the phase angle by using multi frequency bioelectrical impedance analysis (BIA) in overweight and normal weight healthy subjects and to correlate these findings with fasting blood glucose and cholesterol levels.

**Methods:** The study group comprised of 20 overweight volunteers aged 18-50 years, while the control group consisted of age & sex matched, 20 non obese healthy volunteers. Subjects were screened after measuring anthropometric parameters like body weight (Kg), height (cms), waist and hip circumferences (cm). Body Mass Index (BMI) (Kg/m<sup>2</sup>) and waist- hip ratio (WHR) were calculated. BIA was recorded using BodystatQuadscan 4000 to assess fat percentage, fat free mass Index (FFMI), TBW( total body water), ECW ( extra cellular water), ICW (intra cellular water), Phase angle and Illness Marker. The fasting blood glucose (FBG) concentration, total cholesterol and triglyceride levels were estimated using Vitros 250, fully automated auto analyzer. The data was analyzed by applying t- test for independent samples and pearson's correlation by using the SPSS (version 16.0).

**Results:** We found significant differences between the groups for BMI (P=0.000), TBW% (P = 0.000), ECW% (P=0.000), ICW% (P = 0.000), Fat% (P = 0.001), BFMI (P = 0.000), FFMI (P = 0.018), Phase Angle (P = 0.035), Illness Marker (P = 0.001), Se Total Cholesterol (P = 0.000) and Se Triglyceride (P = 0.000). However, we observed no significant difference between the groups for WHR (P = 0.99) and FBG (P= 0.143). We found significant negative correlation with phase angle, with cholesterol (r = -0.31; P< 0.05) and with fat mass (r = -0.31; P< 0.05).

**Conclusions:** Phase angle  $\alpha$  (PA), which reflects changes in electrical conductivity of the body ( indicating either alterations in body composition or alterations of membrane cell integrity) can be used to identify health risk associated with total body fat. Further study may be done with a bigger sample size in obese subjects with metabolic syndrome.

**Corresponding address:** Dr Divya Srivastava; Associate Professor; Department of Physiology; Subharti Medical College; NH-58, Meerut; Ph No: 09456088224, Email: divyaprabhat2000@yahoo.com

## **Effect of yoga training on airway resistance and specific airway conductance in patients of bronchial asthma**

**<sup>1</sup>Divya,<sup>2</sup> Kusumadevi M.S., Shivakumar Veeriah**

P92

<sup>1</sup>A J Institute of Medical Sciences; <sup>2</sup>Bangalore Medical College and Research Institute

**Aim:** To study the effect of yoga on airway resistance and specific airway conductance in patients of bronchial asthma using body plethysmograph.

**Objectives:** To record airway resistance and specific airway conductance in bronchial asthma patients undergoing yoga along with pharmacological treatment and other group consisting of bronchial asthma patients who are only on pharmacological treatment. To compare the results and prognosis between the above two groups at baseline, at 4<sup>th</sup> week and at 8<sup>th</sup> week.

**Methods:** Study included 60 mild to moderate bronchial asthma patients, who were randomly divided into group A (yoga along with pharmacological treatment) and group B (only pharmacological treatment). RAW (airway resistance) and sGAW (specific airway conductance) were measured using body plethysmograph at 0 week, 4<sup>th</sup> week and 8<sup>th</sup> week in both the groups.

**Results:** Group A showed a statistically significant decreasing trend in RAW over a period of 8 weeks, from  $0.528 \pm 0.19$  at baseline to  $0.516 \pm 0.19$  at 4 weeks to  $0.512 \pm 0.19$  at 8 weeks ( $p < 0.001$ ). Group B showed no significant change over 8 weeks, from  $0.577 \pm 0.18$  at baseline to  $0.578 \pm 0.18$  at 4<sup>th</sup> week to  $0.582 \pm 0.18$  at 8 week with p value of 0.195. Group A showed a statistically significant increasing trend in sGAW over a period of 8 weeks, from  $1.02 \pm 0.28$  at baseline to  $1.03 \pm 0.28$  at 4 weeks to  $1.05 \pm 0.28$  at 8 weeks ( $p < 0.001$ ). Group B showed no significant change over 8 weeks, from  $0.95 \pm 0.25$  at baseline to  $0.96 \pm 0.25$  at 4<sup>th</sup> week to  $0.95 \pm 0.25$  at 8 week with p value of 0.266.

**Conclusion:** Results of our study showed that yoga, as an adjunctive therapy significantly improves lung functions in mild to moderate asthma. Reduction in psychological hyperactivity and emotional instability achieved by yoga reduces efferent vagal reactivity, improves thoracic- pulmonary compliance, cleanses airway secretions and leads to bronchodilation there by reduces airway resistance and improves specific airway conductance.

**Corresponding address:** Dr. Divya, D/O A.P.Bhat, 12-533c, modankapu, bantwal - 574219, Mail id- divyabhatap@yahoo.co.in

## To study the effect of exercise on blood pressure and ECG in different categories of body mass index in first year medical students.

P93

Dushyant V. Kulkarni, Kanchan Wingkar, Anand G. Joshi

**Aim & Objectives-** An adolescent obesity is significant public health problem, obesity associated with increased risk for blood pressure & heart diseases. So in present study blood pressure, heart rate, respiratory rate & ECG waves were measured at rest & immediately after exercise, in normal weight, overweight & obese 1st year medical students. The relationship between parameters studied before & after exercise.

**Methodology-** Body mass index, blood pressure, respiratory rate & ECG recording lead II were measured in 73 female & 59 male medical students at rest and after 3 minutes of exercise all the parameters were again measured. Various values were compared.

**Results:** (1) Compared to underweight students ( $BMI < 18.5$ ) in overweight students ( $BMI \geq 25$ ) systolic blood pressure, diastolic blood pressure resting heart rate and "T" wave duration showed significant increases at rest and after the exercise ( $P < 0.05$ ). (2) Compared to male students duration of "T" wave was significantly reduced in females students ( $P < 0.05$ ). No significant differences were observed for other wave studies. (3) Mean values of all the parameters of male and females students were within normal limits.

**Conclusion:** Obesity is associated with increase in resting heart rate, systolic and diastolic blood pressure at rest and even after exercise, which indicates that obesity is associated with increased in risks factor for cardiovascular disorders.

**Corresponding Authors:** Mangal Deep, Near Adarsh Vidyalaya, Malkapur, Tal. Karad, Dist. Satara.

## Effect of exposure to automobile exhaust on the pulmonary function test in traffic policemen in Goa

P94

Edelweiss Rodrigues

Dept of Physiology, Kannur Medical College, Anjarakandy, Kannur, Kerala

**Aims:** To find out, whether various parameters of pulmonary functions are deranged in traffic policemen exposed to automobile exhausts directly and comparing them with policemen who are not exposed to automobile exhaust in the state of Goa.

**Objectives:** To analyse and compare the prevalence of lung disorders in traffic policemen and control groups and to determine the respiratory effects of automobile exhaust in them.

**Methods:** The present study was carried out in 130 traffic policemen (Study group) and compared it with 130 healthy non traffic policemen (control group) in the age group 20-29 years, 30-39 years, 40-49 years and 50-59 years by computerised spirometer. The pulmonary function tests included : Vital capacity (VC), Forced expiratory volume in 1 second (FEV1), Peak expiratory flow (PEF), Maximum voluntary ventilation (MVV), Forced expiratory flow at 25-75% of VC (FEF25-75%) and FEV1 as a percentage of VC (FEV1/VC)

**Results:** It was observed that the values of the pulmonary function parameters such as SVC, FVC, FEV1, FEV1/SVC, MVV, FEF25-75%, and PEF were decreased, in occupationally exposed traffic policemen group in comparison to that of the non-traffic policemen of the control group.

**Conclusion:** On analyzing and comparing the data collected, we conclude that the prevalence of lung disorders, both obstructive and restrictive, in occupationally exposed traffic policemen group was higher than that of the non-traffic policemen of the control group.

**Corresponding Address:** Edelweiss Rodrigues, Assistant Professor, Dept of Physiology, Kannur Medical College, Anjarakandy, 670612, Kannur, Kerala; Fax no: 04972852500; edelweissrod@gmail.com

## Lanthanum causes Lanthanum/Calcium Exchange through Sodium Calcium exchanger.

Elizabeth Clarence, Anand Bhaskar and Sathya Subramani

P95

Department: Physiology, Christian Medical College.

**Background:** The sodium calcium exchanger ( $\text{Na}^+/\text{Ca}^{2+}$  exchanger) plays a central role in regulating contractility in ventricles and automaticity in pace-maker cells. It has a stoichiometry of  $3\text{Na}^+ : 1\text{Ca}^{2+}$  and is capable of working in forward (calcium-extrusive and sodium-acquisitive) and reverse (sodium extrusive and calcium-acquisitive) modes.

Lanthanum is known to inhibit calcium entry in electrically excitable cells, by blocking the reverse mode of sodium-calcium exchanger and voltage gated calcium channels. Action of lanthanum is by competition for  $\text{Na}^+/\text{Ca}^{2+}$  exchanger, which can execute sodium-lanthanum exchange. This study tests our hypothesis that  $\text{Na}^+/\text{Ca}^{2+}$  exchanger is capable of working in lanthanum-calcium exchange mode too.

**Aim:** To demonstrate that the  $\text{Na}^+/\text{Ca}^{2+}$  exchanger is capable of Lanthanum/calcium exchange in isolated rat hearts.

**Objectives:** 1) To induce an increase in cytosolic  $\text{Ca}^{2+}$  with caffeine and sodium-free lithium extracellular solution. 2) To test if the contracture by the above procedure can be relaxed by the addition of lanthanum.

**Methods and results:** Heart isolated from an anaesthetized rat was perfused through coronary arteries in Langendorff mode with normal extracellular solution and paced at a rate of 280 per minute. Left ventricular pressure was recorded with a balloon connected to a pressure transducer. Hearts were initially perfused with normal mammalian extracellular solution during the stabilization period. Subsequent perfusion with sodium-free Lithium extracellular solution and addition of caffeine (25mM) induced a contracture (due to calcium release from intracellular stores by caffeine and lack of its clearance due to absence of sodium in the extracellular solution). While the contracture was maintained in control animals, addition of lanthanum to the perfusate in tests, caused relaxation.

**Conclusion:** Addition of  $La^{3+}$  to the perfusate relaxed the contracted heart favouring our hypothesis that it can move through the NCX by the  $La^{3+}/Ca^{2+}$  mode. This finding is important because it provides another tool for investigating the activity of NCX.

## Beneficial effects of Kombucha in streptozotocin induced diabetic rats

P96

Flora Olinda Dias\*, Chandrakala Shenoy K\*\*.

Karnataka, India. Department of Biosciences, Mangalore University, Mangalagangothri - 574199 \*flrdsouza@gmail.com, \*\*drchandrakala@yahoo.co.uk

**Background:** Kombucha tea (KT) is a traditional beverage prepared by fermenting sweetened black tea with a symbiotic culture of yeast and bacteria. KT is claimed to have various beneficial effects on human health. But there is very little scientific evidence available in the literature.

**Objective:** The purpose of the present study was to investigate the effects of kombucha tea on plasma glucose, and lipid profile in streptozotocin (STZ) induced diabetic rats.

**Methods:** Albino Wistar rats weighing 200-240 g were divided into 3 groups. Group I: Normal control group, Group II: Diabetic control group and Group III: KT pretreated group (pretreated with KT for 28 days followed by induction of diabetes (STZ 50mg/kg body weight, *i.p.*). The experimental animals were sacrificed 48hrs after induction of diabetes (30<sup>th</sup> day).

**Results:** The results obtained were compared to the normal and diabetic groups. The pretreated rats showed reduction in plasma blood glucose levels when compared to the diabetic control rats. There was no significant difference in the plasma insulin levels of pretreated rats when compared to the diabetic control rats. KT Pretreatment lowered the levels of the following parameters in rats: total cholesterol, LDL, VLDL and triglycerides. There was a significant increase in HDL levels.

**Conclusion:** It can be concluded from the studies that KT pretreatment significantly alleviated the altered glycaemic and lipidemic distress in streptozotocin induced diabetic rats. The hypoglycaemic effect of KT may be attributed to increased peripheral utilization of glucose and the hypolipidemic effect may be due to its antioxidant property.

**Keywords:** Kombucha, Insulin, Streptozotocin.

**Corresponding Author:** Mrs. Flora Olinda Dias, Email ID: flrdsouza@gmail.com

Address: Research Scholar, Dept. of Biosciences, Mangalore University, Mangalagangothri, Mangalore- 574199

## Evaluation of heart rate variability by deep breathing test and non- motor symptom scale in Parkinson's disease.

Gayatri Jagtap, Mukta Bidikar

P97

Dept. Of Physiology, TNMC & BYL Nair Ch. Hospital, Mumbai Central-400008;

**Aims:** Autonomic dysfunction and various non- motor symptoms constitute a major component of Parkinson's disease (PD). They are common but often overshadowed by the dominance of motor symptoms. In the present study we evaluated parasympathetic autonomic function with 3 minute deep breathing test. The findings were correlated with severity of PD and non- motor symptom (NMS) score.

**Objective:**(1)To evaluate the parasympathetic autonomic function by deep breathing test. (2) To correlate findings in deep breathing test with stages of PD and NMS score.

**Methods:** 30 diagnosed patients of PD (age 55-70 years) with duration of disease 7+3 years were evaluated by 3 minute deep breathing test with ECG machine. The findings were compared with age and sex matched controls. Severity of disease was assessed by Hoehn-Yahr staging and NMS score was recorded by standardized questionnaire (NMS Quest).

**Results:**There is statistically significant difference ( $p<0.01$ ) between patients and control group for heart rate variability by deep breathing test. A significant reduction was found in heart rate variability with progressive stages of PD as well as with increase in NMS score.

**Conclusion:** There is a paucity of studies on autonomic dysfunction in PD in Indian population. In the present study we found that parasympathetic autonomic dysfunction and NMS are present even in the early stages of PD. Early recognition and treatment of these may decrease morbidity and improve quality of life of PD patients. However a detailed evaluation of autonomic dysfunction and NMS in a larger sample size would be required to further validate our findings.

**Corresponding address:** Gayatri Jagtap Dept. Of Physiology, TNMC & BYL Nair Ch. Hospital, Mumbai Central-400008; Email ID: gayatrijagtap79@gmail.com

## Pulmonary functions and exhaled breath temperature in cystic fibrosis patients

Geetanjali Bade<sup>1</sup>, S.K. Kabra<sup>2</sup>, Anjana Talwar<sup>1\*</sup>

P98

<sup>1</sup> Department of Physiology, <sup>2</sup> Department of Paediatrics, All India Institute of Medical Sciences, New Delhi.

\*Corresponding author: anjanatalwar@gmail.com

**Background:** Cystic fibrosis (CF) is caused by mutations in a single large gene on chromosome 7 that encodes the cystic fibrosis trans membrane conductance regulator (CFTR) protein. Although it is a multisystem disorder, progressive lung disease continues to be the major cause of morbidity and mortality.

**Aim:** To study pulmonary functions and exhaled breath temperature in cystic fibrosis patients.

**Methods:** 11 cystic fibrosis patients and age, sex matched healthy controls were recruited from Paediatric OPD in the present study. In pulmonary functions measurement of forced vital capacity (FVC) and forced expiratory volume in 1 second (FEV<sub>1</sub>) was done using a spirometer (Spiro Air, Medisoft, Kent, UK). Exhaled Breath temperature (EBT), a marker of airway inflammation was also measured with a prototype device.

**Results:** We observed significantly decrease in FVC (1.43±0.39 Vs. 2.06±5.75, p value: 0.0069) and FEV<sub>1</sub> (1.11±0.38 Vs. 1.73±0.64, p value: 0.0123) in cystic fibrosis patients as compared to controls. But no statistically



significant difference was observed in stable temperature recorded i.e. plateau phase of EBT between two groups ( $33.68 \pm 1.84$  Vs.  $33.63 \pm 1.15$ , p value: 0.48).

**Conclusion:** There was a decline in pulmonary functions whereas plateau of EBT, a marker of inflammation was not significantly different in cystic fibrosis.

## A study of the effects of tobacco smoking on intraocular pressure

P99

**Geetha S, S.Lincoln Devakumar**

Department of Physiology, Sri Devaraj Urs Medical College, Kolar

**Background:** Tobacco smoking is probably the most widespread addiction in the world. It is linked to many ocular conditions, glaucoma being one of them. Glaucoma is the commonest cause of irreversible blindness worldwide. An elevated intraocular pressure (IOP) is one of the major risk factors for glaucoma. IOP is the most important modifiable risk factor associated with the development of glaucoma. Factors influencing IOP help in understanding the pathogenesis of Glaucoma and in reducing the burden of blindness.

Studies have associated tobacco smoking with IOP. This study was undertaken to determine whether tobacco smoking has any effect on the intraocular pressure.

**Materials and Methods:** The study was carried on at Dr. B. R. Ambedkar Medical College and Hospital, Bangalore.

200 males of age group 20-40 years were studied. Of these, 100 males were tobacco smokers and the other 100 were non smokers. IOP was recorded using a Schiotz's tonometer.

**Results:** The study showed there was insignificant difference in the IOP between tobacco smokers and non smokers.

**Conclusions:** Tobacco smoking is not associated with IOP according to this study.

**Corresponding address:** Dr. Geetha S, Assistant Professor, Department of Physiology

Sri Devaraj Urs Medical College, Kolar

## A study of thyroid function measured by serum TSH level in premenopausal and postmenopausal women of Dibrugarh town.

P100

**Gitartha Bordoloi, Reeta Baishya**

Department of Physiology, Assam Medical College & Hospital, Dibrugarh

**Objective:** To compare the thyroid hormone levels in premenopausal and postmenopausal women of Dibrugarh town.

**Method:** 50 healthy premenopausal and post-menopausal women of the age group of 30-60 years of Dibrugarh town were included in the study. 5 wards were selected randomly from 22 wards of Dibrugarh town. 10 cases were taken from each ward. The first house in each selected ward was visited & enquired for required age group women. Thereafter consecutive houses were visited & blood samples collected. Proper exclusion criteria were applied during selection of the study population. Blood was subjected to centrifuge and plasma was separated. Serum TSH level was estimated in the RIA centre taking the reference level as 0.5-4.5  $\mu$ IU/ml.

**Results:** The TSH values of 27 postmenopausal and 23 premenopausal women were subjected to unpaired t-test. The mean±SD of serum TSH values were found to be higher in postmenopausal age group than the premenopausal group and this difference was significant (P value<0.05).

**Conclusion:** The thyroid functions declines with increasing age and postmenopausal women are more susceptible to hypothyroidism. Moreover, due to similarity of hypothyroid symptoms with menopausal symptoms there may be undiagnosed cases. So estimation of serum TSH level is encouraged in postmenopausal women.

**Corresponding address:** Dr. Gitartha Bordoloi, Department of Physiology, Assam Medical College and Hospital, Barbari, Dibrugarh, Assam, PO- AMC, PIN- 786002; Email: gitartha.bordoloi@gmail.com

## Lung functions in type-2 diabetes and its correlation with glycemic index.

PI01

**Gouher Banu, and Manjunatha Aithala**

Department of Physiology, BLDEU's Shri B M Patil Medical College Hospital and Research Centre Bijapur.

**Objective:** The purpose of this study was to evaluate pulmonary functions in patients with type 2 diabetes mellitus and to determine their correlations with glycemic index.

**Material & methods:** 40 type2 diabetic patients, aged 30-60years, with diabetic duration of 1-20 years, were included in the study. FVC, FEV1, FEV1%, & MEP are recorded & the results were compared with age and sex matched control (non diabetic) subjects. Results were analyzed by calculating Mean±SD, using Student's t test, and Pearson correlation.

**Results:** All the respiratory parameters are reduced in type2 diabetic patients compared to control of which FEV1, FEV1%, & MEP show highly significant reduction ( $p=5.953E-06$ ,  $4.19E-07$ ,  $1.206E-06$  respectively for FEV1, FEV1%, & MEP). Lung Functions are negatively correlated with glycemic index ( $r=-0.390$ ).

**Conclusion:** The present study shows reduced dynamic lung functions in type2 diabetic subjects. Lung functions are negatively correlated with glycemic index. As MEP is significantly reduced in study group we attribute this reduction in lung function tests to respiratory muscle weakness. Breathing exercises to strengthen the respiratory muscle may improve the lung function tests.

**Key words:** Type2 diabetes, Forced vital capacity, FEV1 Lung function tests. FEV1% MEP

**Corresponding address:** \*Department of Physiology, BLDEU's Shri B M Patil Medical College Hospital and Research Centre Bijapur. E-mail: drgouherashaikh@gmail.com

## Study of Cardiovascular Risk factors in first year MBBS and BDS students.

PI02

**Gouri Sharad Joshi, A. G. Joshi and A.R.Gargate**

**Aims & Objectives :** Because of modernization, increased mental stress, lack of exercise, sedentary life style, improper diet prevalence of obesity and cardiovascular disorders increased. So in present study various cardiovascular risk factors in male and female in medical students were studied.

**Material & Method:** For present study, 152 students were selected from Krishna Institute of Medical Sciences, Karad. Estimation of fasting BSL, Lipid profile (LP), blood pressure (BP), heart rate (HR), body mass index (BMI), neck circumference (NC), waist hip ratio (W/H) were measured. Stress score was calculated by using std. stress questionnaire.

**Result:** In males W/H, NC, Systolic and Diastolic BP, HR, FBSL, TG, VLDL, LDL were significantly high as compared to females ( $P < 0.01$ ) while HDL was significantly low ( $P < 0.001$ ). Increased BMI was associated with significant increase in W/H, NC ( $P < 0.001$ ), FBSL, LDL ( $P < 0.01$ ) while significant decrease in HDL level ( $P < 0.001$ ). Increased stress score was associated with significant increase in diastolic BP ( $P < 0.05$ ) and significant decrease in HDL ( $P < 0.001$ ). In females increased BMI was associated with increase in W/H, TG, LDL, VLDL ( $P < 0.05$ ), N.C. ( $P < 0.001$ ) and gradual decrease in HDL ( $P < 0.01$ ).

**Conclusion:** In males, Cardiovascular Risk Factors were significantly increased as compared to females indicating males were at more Risk of Cardiovascular disorders. Increased obesity (BMI) and increased stress score were associated with significant increase in Cardiovascular Risk Factors. This is pilot study and large scale study is required to confirm.

**\*Address for correspondence:-** Ms. Gouri Sharad Joshi, Dept. of Physiology, Krishna Institute of Medical Sciences University, Karad Tal- Karad Dist- Satara. **Email-** jgouri123@gmail.com

### **Comparative study of certain anthropometric and cardiovascular parameters in sedentary and non-sedentary subjects**

PI03

**Gunjal laxmichhaya A, Kharate Bhakti.**

Department of Physiology, TNMC & BYL Nair Ch. Hospital, Mumbai

**Aims:** To assess the differences in certain anthropometric and cardiovascular parameters in healthy sedentary and non-sedentary subjects in the age group of 25-55 years

**Objective:** To study the effect of sedentary life style on anthropometric and cardiovascular parameters

**Methods:** Anthropometric parameters such as weight, height, waist circumference, hip circumference, waist to hip ratio and mid arm circumference were assessed. Cardiovascular parameters such as pulse rate, blood pressure were assessed

**Results:** Comparisons were made between 100 sedentary and 100 non-sedentary subjects. Student's t-test (Unpaired) was used for comparisons between the groups. In our study, there was a statistically increase in body mass index ( $< 0.001$ ), waist to hip ratio ( $< 0.05$ ) in sedentary male and female subjects. There was statistically increased in Pulse rate ( $< 0.001$ ), systolic blood pressure ( $< 0.001$ ) and diastolic blood pressure ( $< 0.001$ ) in sedentary male and female subjects

**Conclusion:** Sedentary lifestyle was associated with increase in BMI, WHR, MAC, SBP, DBP, PR. Although our study is by no means exhaustive, it provides a glimpse into the variety of adaptations /alterations in anthropometric and cardiovascular structure and function that occurs due to sedentary life style, even in the absence of overt disease. Those who are sedentary, an exercise program is an excellent way to significantly improve their health. Maintaining a healthy lifestyle, including exercise, will result in increased energy levels throughout working period. The benefits of regular physical activity are numerous, people who exercise live longer and healthier.

**Corresponding Address:** Gunjal laxmichhaya A, Department of Physiology, TNMC & BYL Nair Ch. Hospital, Mumbai Central-400008. Email ID :- laxmichhayagunjal@gmail.com

## Level of physical activity among doctors in Regional Institute of Medical Sciences, Imphal, Manipur.

P104

H.Hungyo<sup>1</sup>; Sarada N<sup>2</sup>.

Dr. H.Hungyo. PGT, Physiology Department, RIMS, Imphal.

E-mail address: dr.hungyo@gmail.com.

**Aims & objects:** To assess the level of physical activity among doctors in RIMS and the cardiovascular responses to physical activity and to compare and correlate the level of physical activity findings from Questionnaires and the Treadmill Test.

**Materials & Methods:** The present study was carried out in the department of physiology, RIMS, Imphal. The study was focussed to a group of PGTs & House Officers working in RIMS, Imphal. 50 doctors (PGTs and House Officers) irrespective of range of ages participated in the study. The participants were subjected to TMT using Bruce protocol along with Questionnaires (Short term last 7 day Recall Self-administered format). Analysis of variables mainly, Heart Rate, BP (pre & post TMT) and METs values were done by one-way ANOVA. Paired t-test of METs values of Questionnaire and TMT was done.

**Result:** Mean and S.D. of the Heart rate ( $78.78 \pm 8.264$ ), systolic BP ( $125.30 \pm 12.436$ ), diastolic BP ( $80.82 \pm 7.620$ ) and the Questionnaires METs values ( $7.2140 \pm 4.02345$ ) were all raised significantly in Treadmill Test With Mean and Standard Deviation ( $164.44 \pm 13.961$ ); ( $152.80 \pm 10.908$ ); ( $85.02 \pm 10.131$ ) and ( $8.7640 \pm 2.14360$ ) respectively. There was strong correlation of METs values between Questionnaires and TMT.

**Conclusion:** The finding, according to the present study, suggested that most of the doctors in the study group attained vigorous intensity level of physical activity. It was also found that the findings i.e. level of physical activity from the Questionnaires were well correlated with the findings from TMT.

## Three-D printing in medical field

P105

Harshali Rankhambe

Department of Physiology, TNMC & BYL Nair Ch. Hospital, Mumbai Central-400008

Email id: rharshali@ymail.com

**Main Concept:** Organ printing or biomedical application of rapid prototyping, also defined as additive layer-by-layer biomanufacturing of functional living macrotissue, is an emerging transforming technology in Medical field. The main practical outcome of organ-printing technology are industrial scalable robotic biofabrication of complex human tissues and organs, automated tissue based *in vitro* assays for clinical diagnosis, developing potentially highly predictive human cell- and tissue-based technologies for drug discovery and drug toxicity, and complex *in vitro* models of human diseases.

Organ printing mimics the natural biological process of embryonic cellular fusion by layering high cell density, self-assembling tissue spheroids into a three dimensional pattern similar to that of the desired organ shape. Simultaneously, various compounds are printed to support the cells and maintain the proper shape until the cells produce their own Extra Cellular Matrix. Most importantly, since computers control the bioprinting process, cell droplets can be printed in various and complex arrangements with high degrees of precision and accuracy. Because of its rapid prototyping capabilities, scalability, and computerized processes, the bioprinter holds the highest industrial and commercial potential among the main tissue engineering methods

**Hypothesis:** Bioprinted assays can provide pharmaceutical researchers with better, quicker data, the entire drug-discovery process will accelerate & also less extensive animal testing will be required. Bioprinters could build organs with tumors or other defects so that surgeons could practice on them.

## Immediate effect of meditation on blood pressure profile in medical students

PI06

**Hasmukh Shah, Wasim Shaikh, S.K.Singh**

Dept. of Physiology, Pramukhswami Medical College, Karamsad, Gujarat, India

**Background:** There are substantial evidence on the usefulness of meditation for the reduction of blood pressure and stress. Regular practice of meditation improves cardiovascular and mental health. There are lots of documented evidences that meditation is effective in coronary artery diseases.

**Aims/Objective:** To ascertain immediate effect of meditation on blood pressure profile in young healthy medical students.

**Methodology:** Our study was done in 42 healthy medical students of 17-19 years of age group of Pramukhswami Medical College, Karamsad. In control group, blood pressure and pulse was taken initially then they were allowed to sit comfortably in quit room for 10 minutes, after that again blood pressure and pulse was taken. In study group, students were asked to sit in quit room and meditation was done for 10 minutes. In this group, blood pressure and pulse was taken before the meditation and after the meditation.

**Results:** In comparison to control group, in study group SBP was significantly reduced from  $116.38 \pm 14.10$  to  $109.88 \pm 10.55$  ( $P < 0.05$ ). But there is no significant reduction in DBP and pulse in study group.

**Conclusion:** Meditation is useful in reduction of blood pressure and best of way of life for healthy heart.

**Corresponding Address:** Dept. of Physiology, Pramukhswami Medical College, Karamsad-388325, Gujarat, India. E-mail: drwasimsh@gmail.com

## Pulmonary function test in patients with untreated symptomatic hypothyroidism

PI07

<sup>1</sup>Indira ghosh, <sup>1</sup>Sumitra Sen, <sup>1</sup>Asmita Chokroborty, <sup>1</sup>Supriya Sardar, <sup>2</sup> Sujit Kumar Dey

<sup>1</sup>Department of Physiology; <sup>2</sup>Department of Biochemistry, R G Kar Medical College, Kolkata.

**Objective:** The objective was to determine whether there is any alteration in pulmonary functions in untreated symptomatic hypothyroid patients in comparison to healthy control.

**Methods:** This is a cross-sectional study conducted in the months of August and September, 2013 at R G Kar Medical College, Kolkata. Fifteen patients with recently diagnosed symptomatic hypothyroidism were taken as case and fifteen euthyroid individuals of similar age group were recruited as control. Spirometry tests were performed in both the groups at the department of physiology and parameters like FVC, FEV1, FEV1/FVC, PEFr, FEF25-75% were compared and results were analysed.

**Results:** Hypothyroid patients showed a significant reduction in FVC (P value=0.0272) and PEFr (P value=0.0058) values in comparison to the control group. Values were analysed by unpaired t test.

**Conclusion:** These parameters indicate that the pulmonary functions have been significantly affected in hypothyroidism. The cause of this may be due to diminished respiratory muscle strength in thyroid deficiency.

**Corresponding address:** Dr.Prof. Anil Baran Singha Mahapatra, HOD of Physiology, R G Kar Medical College, Kolkata. Email address: drindughosh@gmail.com

## Effects of yoga asana and pranayama on brain in type 2 diabetes

**Indla Yogananda Reddy, Rajani Santhakumari**

PI08

Department of Physiology, Medici Institute of Medical Sciences

Diabetes will effect the central nervous system also, beside peripheral nervous system. Effects of diabetes on central nervous system can be assessed by studying the cognition and cardiac autonomic functions. We have selected 16 type 2 diabetic subjects of both the sexes, minimum education qualification is 10<sup>th</sup> includes 8 subjects, who are doing yoga asana and pranayama since one calendar year, control group includes 8 subjects who are not on any specific physical activity. Cognition is assessed by Addenbrook's cognitive examination revised (ACE-R) battery. Cardiac autonomic functions are studied with cardiac autonomic (CAN) tests-which include both sympathetic and parasympathetic tests. Statistical analysis is done by using student "t" test. P value <0.05 is considered as significant. ACE-R scores are significantly more in test group than in control group which means test groups are having better cognition than control group. CAN tests are showing better results in test group than in control group. Yoga asana and pranayama are helpful in protecting brain in type 2 diabetes.

**Corresponding author:** Indla Yogananda Reddy, Associate professor, Department of Physiology, Medici institute of medical sciences, Ghanpur, Medchal, Hyderabad -501401 , Fax-08418256254, mobile-09866887355, Email-yoga4udotcom@yahoo.co.in

## Status of Autonomic Activity in Primary Open Angle Glaucoma

**Indu Khurana, C S Dhull, A K Khurana, Sumit Sachdeva**

PI09

Sr. Professor, Physiology, Pt. B D S PGIMS, Rohtak, Haryana

**Aim:** Aqueous dynamics and intraocular pressure (IOP) are affected by autonomic activity, therefore, autonomic dysfunction could be a contributing pathophysiological factor to onset of Primary open angle glaucoma (POAG). However, relatively less information is available on autonomic functions in glaucoma.

**Objective:** To study the status of autonomic activity in patients with POAG by basal heart rate variability and to find out the effect of autonomic dysfunction, if any, on mean ocular perfusion pressure.

**Methods:** The study was conducted in 40 subjects divided in two groups of 20 each (group 1-patients with POAG and group 2- controls). Basal HRV was recorded on power LAB26T polyrite D system by ECG lead II for 5 minutes. The time domain and frequency domain variables of HRV were recorded and analyzed.

Mean ocular perfusion pressure was measured by subtracting the value of IOP from MAP (MOPP=MAP-IOP).

**Results and conclusion:** The significant low value of time and frequency domain variables, and high value of LF/HF in group 1 as compared to group 2 is suggestive of reduction in parasympathetic tone and relatively increased sympathetic tone indicates autonomic dysfunction. Non significant low value of MOPP in group 1 as compared to group 2 also indicative of the effect of autonomic dysfunction on aqueous humor dynamics. The study concludes that assessment of autonomic system should be included in routine clinical workup of glaucoma patients.

**Corresponding address:** Dr. Indu Khurana, Sr. Professor, Physiology, Pt. B D S PGIMS, Rohtak, Haryana **Email I.d.** – drindukhurana@gmail.com

## To study the relation of blood sugar with BMI among 2nd year MBBS students of Gauhati Medical College

Ipsita Das<sup>1</sup>, Shrabani Barman<sup>2</sup>

P110

Department of Physiology, Gauhati Medical College.

**Aims And Objectives:** There has been a rapid increase in the prevalence of diabetes and cardiovascular disease in India, in association with modest overweight and rapid changes in diet and lifestyle. The present study was undertaken to see if there was any relation between the BMI and blood sugar levels among 2<sup>nd</sup> yr MBBS students.

**Materials and Methods:** 30 MBBS students of GMCH were selected as subjects. Among the 30 students 13 were overweight (case) and 17 were normal weight (control).

Period of study: August 2013.

Fasting blood glucose was tested using oxidase peroxidase method by kit reagent and body mass index (BMI) was calculated by the Quetelet index. Statistical analysis was done using unpaired student t test.

**Results:** The mean FBS of overweight students was higher ( $100.08 \pm 6.51$ ) than the normal weight students ( $86 \pm 7.10$ ). This difference is statistically significant ( $p < 0.05$ ).

**Conclusion:** It can be concluded that there is a positive association between FBS and BMI. Subjects having higher BMI were found to have higher FBS level and hence are more predisposed to develop diabetes and other metabolic diseases. Further studies would throw more light on the topic.

**Corresponding address:** Dr (Mrs) Shrabani Barman, Prof and HOD, Department of Physiology, Gauhati Medical College.

## Brain computer interface: a way towards cyborgism

Jadhav Sanjivani S, Venkatraman Brinda.

P111

Dept. Of Physiology, TNMC & BYL Nair Ch. Hospital, Mumbai Central-400008.

**Concept:-** Brain-computer interface is a method of communication based on neural activity generated by the brain, independent of its normal output pathways of peripheral nerves and muscles. Like any other communication systems, BCI has inputs, outputs and translation algorithms. BCI operation involves interaction of user's brain, which produces the input and computer system, which translates that activity into output (specific commands that act on the external world) or vice-versa.

The input of neural activity used in BCI is recorded using invasive or non-invasive techniques. Invasive BCI's use single-unit activity within cortex or EEG recorded sub-durally. Non-invasive BCI inputs include slow cortical potentials, P300 evoked potentials and sensorimotor imagery which induce changes in EEG spectral power (usually mu rhythm band). Other potentials which are under research are event-related de-synchronization (ERD), event-related synchronization (ERS), Steady-state visually evoked potentials (SSVEP), ASSRs (Auditory steady-state responses). Also for some mental task like arithmetic, emotions; fMRI is also being tested.

**Applications:-** Current interest in BCI is mainly for augmentative communication option for those with severe motor disabilities like amyotrophic lateral sclerosis, brainstem stroke and spinal cord injury so that they can express their wishes, operate word processing programs or neuroprostheses. Also BCI is finding its way in people with disorders of consciousness (DoC), visual and auditory impairment.

Futuristic way would be to integrate it into entertainment industry to integrate sensorimotor perceptions, emotion into movies, video games, toys etc. BCI development depends on close interdisciplinary cooperation between neurophysiologist, psychologist, engineers, computer scientists, and rehabilitation specialists.

**Corresponding address:** Jadhav Sanjivani S, Dept. Of Physiology, TNMC & BYL Nair Ch. Hospital, Mumbai Central-400008. Email ID:-sanjuj03@gmail.com

### **Anxiolytic activity of ethanolic extract of *Tylophora indica* on ethanol induced anxiety in Wistar albino rats.**

P112

**J, Shyamjith M, Rao S N.**

Dept of Pharmacology, Yenepoya Medical College, Yenepoya University, Mangalore

**Aim & Objective :** To investigate the antianxiety effect of ethanolic extract of *Tylophora indica* in alcohol induced anxiety in Wistar albino rats.

**Methods :** The anxiolytic activity of the ethanolic extract of *Tylophora indica* in alcohol induced anxiety was assessed using Elevated Plus Maze (EPM). The animals were divided in three groups; Group I received distilled water; acted as normal control; Group II serving as the diseased group received alcohol (7% v/v) orally and group III acting as the treatment group was administered simultaneously alcohol (7% v/v) and ethanolic extract of *Tylophora indica* (100 mg/kg) orally. All drugs were administered for ten days. On 10<sup>th</sup> day, 1 hour after the administration of drugs, the animals were kept on the elevated plus maze to observe their anxiety status. The time spent in the open arm and the time spent in the closed arm of the maze were recorded.

**Results :** Our results demonstrated that the animals (group III) which received ethanolic extract of *Tylophora indica* along with alcohol has significantly ( $p < 0.01$ ) spend more time in open arm of the maze and less time in closed arm of the maze on comparing with the animals of group II which received only alcohol. These results indicate that the ethanolic extract of *Tylophora indica* has significant anxiolytic activity.

**Conclusion:** Alcohol induced anxiety can be alleviated by the co-administration of the indigenous medicinal plant *Tylophora indica*.

**Corresponding address :** Jahas J, Dept of Pharmacology, Yenepoya Medical College, Yenepoya University, Derlakatte, Mangalore-575018, Email id : jahas\_jalal@hotmail.com

### **Ulnar nerve sensory action potential changes around wrist in physiologically normal subjects in different age groups**

P113

**Jaishree Tapadia, Ajoy Sodani. S. Bose**

B1-602, Shehnai Residency, Opp. Amarvilas Hotel, A.B. Road Indore (MP)

**Introduction:** present study is to evaluate changes in ulnar nerve sensory action potential with age at wrist. changes occurs at a greater rate in median than in ulnar nerve due to increased susceptibility of the median nerve to repetitive motion trauma or higher intracarpal canal pressure with contract stress and awkward wrist posture, over several decades may account for the more influence of the aging process on the median nerve compared with ulnar nerve at wrist. Electro physiological changes are probably related to the normal Histological ageing changes in peripheral nerves

**Methods:** An observational descriptive study was conducted in 170 healthy subjects of SAIMS, by Viking Quest EMG and Master copy software 48.0. The measurement of sensory amplitude were carried out on ulnar nerve at wrist.



**Result:** In the present study sensory amplitude result was statistically not correlated with increasing age, though a declining trend of amplitude with Aging was evident.

**Conclusion:** Our study on SNAP amplitude of ulnar nerve showed a declining trend with age.

**Corresponding address:** Dr Jaishree Tapadia, B1-602, Shehnai Residency, Opp. Amarvilas Hotel, A.B. Road Indore(MP) Phone number 9826649491, E-mail address: jaishree\_tapadia@yahoo.in

### **Gamma-linolenic acid prevents deterioration of MNCV in STZ diabetic rat**

P114

**Janardhan Singh, Nishikant, Sood S\*, Vijayshankar\*\***

Department of Pharmacology, Physiology\* & Biochemistry\*\*, PGIMS, Rohtak-124001(Haryana).

**Objective:** To investigate role of gamma-linolenic acid (GLA) on motor nerve conduction velocity (MNCV) in STZ diabetic rats.

**Methods:** In albino rats of either sex, weighing 250-300g, diabetic neuropathy was induced by streptozotocin (STZ) 50 mg/kg, ip, single injection. MNCV was determined in sciatic-posterior tibial conducting system of ether anesthetized rats by EMG. Body weight, blood & urine sugar levels were estimated initially (0 week) and at weeks 4, 8 and 12. Rats were divided into 4 groups of 10 each. Group I-Control, Group II-STZ (50mg/kg, ip). Group III-GLA (50mg/kg, po, daily by gavage) 5 days prior to STZ and continued for 12 weeks. Group IV-STZ+ insulin (4 units/kg, sc, twice daily) for 12 weeks.

**Results:** MNCV in diabetic rats was significantly ( $p < 0.01$ ) reduced after 8 weeks of STZ. GLA (50 mg/kg, po, daily) pre treatment resulted in an increase in MNCV as compared to STZ diabetic rats but remained less as compared to control. GLA pre treatment failed to alter blood/urine sugar levels in STZ diabetic rats. Insulin treatment prevented the development of STZ induced hyperglycemia. Administration of GLA prevented the reduction in body weight in diabetic rats. However, body weight was markedly increased in GLA pre treated diabetic rats.

**Conclusion:** GLA prevents reduction in MNCV in STZ diabetic rats

**Corresponding address:** Janardhan Singh, Department of Pharmacology, Physiology\* & Biochemistry\*\*, PGIMS, Rohtak-124001(Haryana). E.mail: dr\_jansingh@yahoo.co.in

### **Cardiovascular changes associated with regular moderate intensity exercise of short duration and determination of aerobic capacity in apparently healthy medical students**

**Jayvardhan Singh<sup>1</sup>, Sunita Tiwari<sup>2</sup>, R B Kamal<sup>1</sup>, D K Verma<sup>2</sup>**

P115

<sup>1</sup>Department of Physiology, M.L.N. Medical College, Allahabad; <sup>2</sup>Department of Physiology, KGMU, Lucknow.

This study is aimed at studying the effect of regular moderate intensity exercise (150 minutes/week of at least 8 weeks duration) on the cardiac parameters of apparently healthy male medical students and to determine their aerobic capacity in the form of VO<sub>2</sub> max and its correlation with the baseline cardiopulmonary and anthropometric parameters. Data were collected by using graded exercise test on a treadmill following submaximal Bruce protocol and aerobic capacity was calculated by extrapolation method. Repeated measures ANOVA with Tukey's post hoc test was applied to see the differences between the regularly exercising (study) and irregularly exercising (control) groups by using STATISTICA software (windows version 6.0). Observed results show that diastolic blood pressure decreases significantly with increasing grades of exercise ( $p < 0.05$  in stage 2 and  $p < 0.01$  in stage 3) in study group than the control group. VO<sub>2</sub> max of the study group was also found to be higher ( $p < 0.05$ ) than

control group. It is concluded that regular 150 minutes/week of moderate intensity exercise such as brisk walking is useful and can be achieved by most students with one of the most common cited barriers being lack of time.

**Key words:** regular exercise, aerobic capacity

**Corresponding address:** Dr. Jayvardhan singh. Department of physiology,MLNMedical College, Allahabad, U. P., 201001; Email: jayvardhanmd@gmail.com

## **Comparative study of cardiovascular risk factors among tobacco chewers and tobacco non chewers**

P116

Jaywant S. Thorat, P.M. Somade, Jharashree Sahoo

**Aims and objectives:-** Tobacco smoking is known causative factor of cardiovascular disorders and cancer. In India tobacco and gutkha chewing is very common. In present study effect of tobacco chewing was studied on other cardiovascular risk factors. This is comparative study done to see the association of smokeless tobacco consumption with blood pressure, heart rate, BMI, blood sugar, serum lipid, serum cotinine in adult male tobacco chewers.

**Methods:-** In present study 160 apparently healthy males were selected. Out of these 80 were tobacco non chewers and 80 were tobacco chewers. Parameters such as BMI, B.P., heart rate, blood sugar, serum lipids and serum cotinine were measured in both the groups.

**Result:-** No significant difference was observed among tobacco chewers and controls for heart rate, BMI, blood sugar, and lipid profile like total-C, LDL-C, VLDL-C. However significant increase was observed in systolic and diastolic blood pressure ( $P > 0.001$ ) and decrease in HDL-C level ( $P > 0.001$ ) in tobacco chewers as compared to tobacco non chewers.

**Conclusion:-** Significantly increased values of systolic and diastolic blood pressure and significantly decreased values in HDL cholesterol indicated that tobacco consumption in any form increases the risk for cardiovascular diseases.

**\*Address for correspondence:-** Mr. Jaywant S. Thorat, Dept. of Physiology, Krishna Institute of Medical Sciences University, Karad, Tal- Karad Dist- Satara. **Email-** jaywantviews@gmail.com

## **Cardiovascular responses and cardiac work of selected daily activities in normal healthy indian subjects between 18 to 30 years**

P117

Jean Fredrick, Mario Vaz

Department of Physiology, St. John's Medical College, Bangalore – 560034.

**Objectives:** Data suggest that habitual daily activities can result in significant cardiovascular responses that might have implications for individuals with coronary artery disease. This study determined the cardiac work for various activities encountered during daily living.

**Methods:** We evaluated cardiovascular responses in 42 young adults (21 M, 21 F) to graded activities. Subjects were divided into three groups each of which performed one light, one moderate, and one heavy activity based on published METS. Cardiovascular responses were evaluated using impedance cardiography (BOMED instruments, USA) and automated blood pressure monitor (Welchallyn,USA). Cardiac work was computed as the double

product (Heart Rate x Systolic Blood Pressure) and triple product [Systolic Blood pressure x Cardiac Output (SVxHR)]. Perceived exertion was evaluated using Borg's Scale.

**Results:** There was a high variability in cardiovascular responses for each activity. There were, by and large, no gender differences across the activities. Cardiac work was significantly higher with heavy activities than light activities using both indices, however, the triple product showed greater discriminatory ability in evaluating differences in cardiac work across all categories of activities.

**Conclusion:** The data suggest a need to develop a compendium of cardiac work related to habitual activities to guide doctors and patients.

**Corresponding address:** Jean Fredrick, Department of Physiology, St. John's Medical College, Bangalore – 560034. E mail: drjeanfredrick@gmail.com

### The role of sodium-calcium exchanger in rhythm generation in rat heart.

Jesi.W, Anand Bhaskar, Sathya Subramani

Department of Physiology, Christian Medical College, Vellore.

P118

**Background:** The pacemaker potential which is responsible for rhythm generation in heart involves four currents namely  $I_f$  (funny currents), currents due to T-type calcium channels, L-type calcium channels, and Sodium calcium Exchanger (NCX) in forward mode.

**Aim:** To study the contribution of NCX in rhythm generation using Ouabain in isolated rat heart model.

**Methods:** Isolated heart preparation of Wistar rats (n=6) perfused with mammalian ringer in Langendorff mode was used for this study. The basal heart rate with mammalian ringer was recorded for the first 15 minutes, then Ouabain (100  $\mu$ M) was added to the perfusate and the heart rate was recorded for 15 minutes, followed by 15 minute recording of heart rate again with normal mammalian ringer solution.

**Results:** There was a significant reduction in heart rate following perfusion with 100  $\mu$ M Ouabain (p 0.03 with Wilcoxon Signed Rank test). And there was partial reversal of heart rate after washout of Ouabain with normal mammalian ringer.

**Conclusion:** The significant reduction in heart rate with Ouabain while the other three currents remained active shows the importance of NCX in rhythm generation.

### Study of Impact of Socio-Behavioral Factors on the Academic Performance of 1<sup>st</sup> Year Medical Students

Jha Kamlesh, K Tribhuwan, Singh Ramji, Singh PN

Dept of Physiology, AIIMS, Patna

P119

**Background:** Health sciences are known to be demanding as far as academic performance is concerned. Various factors like stress, class attendance, and academic background are known to affect the academic performance of medical students.

**Aim and Objective:** This study aims to find out factors affecting academic performance of first year medical students with an objective of analysis based upon parameters like class attendance, stress, hours of study, self-assessment scores and use of technology.

**Materials and Methods:** With due written consent, 49 first year medical students of AIIMS Patna completed battery of questionnaires regarding stress and academic behavior as a routine procedure. Records regarding academic performance and class attendance gathered from the institute taking care of anonymity and analyzed statistically using statistical software SPSS 20.

**Result:** Attendance appeared to be most significant factor co-relating academic performance. Single linear co-relation analysis also well co-related stress, study hour and self-assessed satisfaction and performance score with actual academic performance ( $p < 0.05$ ). But step-wise multiple regression analysis models showed that keeping class attendance as constant, stress becomes non-significant factor for academic performance.

**Conclusion:** In our study the attendance appears as single most important factor affecting students' performance. However other factors like stress, study-hours and self-satisfaction are important, but not a determining factor for performance in first year medical students.

**Key-Words:** Academic Performance, Class attendance, Stress, Study- hours

**Corresponding address:** Dr. Kamlesh Jha, Dept. Of Physiology, AIIMS, Patna

Email: drkamleshj@aaimspatna.org

## **EMG study in cases of maturity onset diabetes neuropathy**

P120

**Jinal Pandya, Neeraj Mahajan, Kena Jasani**

**Aims and objectives:** To determine the association between types of clinical presentation and severity of neuropathy in NIIDM by electromyography

**Methods:** The study was carried out at private EMG center at Ahmedabad in 2012. Total randomly selected 52 cases male (39), female (13) symptomatic cases of NIDDM were included in study. We included known cases of NIDDM aged 32-88 excluding IDDM and asymptomatic NIDDM patient. The standard Needle EMG was used for study.

**Results:** From our study it was found that maximum (40.3%) cases seen with 6-10 years duration, 57.6% cases have BMI < 18.5, 61.1% have > 5'7" height, 80.7% don't have positive family history. Associated diseases are HT (23%), CAD (17.3%). Presenting symptoms are tingling-numbness (73%), difficulty in walking (55.7%) Presenting signs are reduced or absent DTR (84.6%) and blunting of sensation (75%) All four limb demyelinating neuropathy seen in 76.9% and LL > UL in other 11.5% cases. All four limb axonal degeneration seen in 11.5% cases while exclusively lower limb is involved in 23% cases

**Conclusion:** From our study we concluded that Factors affecting are old age (>55) male gender, underweight (BMI < 18.5), height > 5'7", duration > 5 years. Further studies for associated diseases are recommended. Common symptoms are tingling numbness and signs are blunting of sensations. Common type (>75%) of neuropathy is demyelinating distal symmetrical.

**Corresponding address:** Dr. Jinal Pandya, 27.vaibhav bungalows part 3 near gulab tower sola road Ahmedabad-380061; email: jinalpandyaa@gmail.com

## Local Anesthetic Blocked Hyperglycemic and Diabetic – Induced Changes of Sodium Currents in Sensory Neurons

P121

Jitendra n. Singh, Shivsharan b. Kharatmal, Rathej Meerupally and Shyam S. Sharma

Electrophysiology Laboratory, Department of Pharmacology and Toxicology, National Institute of Pharmaceutical Education and Research (NIPER), Sector-67, SAS Nagar (Mohali)

**Aims and Objective:** Hyperglycemia is known to produce neuropathic pain in long term diabetic patient. Sensory neurons incubated with high concentration of extra-cellular glucose, for long time may cause cellular damage by altering the voltage-gated sodium channels (VGSCs)  $\text{Na}^+$  channels. Yet, the role of local anesthetics involvement for neuropathic pain in diabetes is poorly understood, where VGSCs are mainly involved. Thus, it is necessary to examine how VGSCs contribute to sensory disturbances in diabetic neuropathy.

**Method:** We have investigated the effects of extra-cellular glucose exposure on sodium current ( $I_{\text{Na}}$ ) using whole-cell voltage-clamp configuration in cultured dorsal root ganglion neurons (DRG) from neonatal rats and streptozotocin-induced diabetic adult rats. Moreover, we have studied effects of local anesthetic (tetracaine) on altered  $\text{Na}^+$  channel activity.

**Results:** After induction of diabetes, in comparison to age-matched control,  $I_{\text{Na}}$  was found to be increased. The increased activity of  $\text{Na}^+$  channels was blocked by tetracaine in diabetic and hyperglycemic conditions as compared to respective control. The depression of the  $I_{\text{Na}}$  on tetracaine exposure was independent of voltage or time. These agents elicited a positive shift in voltage-dependence of activation and negative shift in steady-state inactivation curves in agreement with biophysical properties.

**Conclusion:** The  $I_{\text{Na}}$  density was increased significantly with the progression of neuropathic pain and hyperglycemia. Local anesthetic, tetracaine potentially blocked  $\text{Na}^+$  channel activity in diabetic and hyperglycemic sensory neurons. These findings suggest that hyperglycemia-induced changes in VGSCs alter neuronal excitability and local anesthetic like tetracaine would be therapeutically useful in neuropathic pain.

**Acknowledgement:** Authors are thankful for the financial assistance from Council of Scientific and Industrial Research, New Delhi to project (37(1411) /10/EMR-II).

**Corresponding address:** Jitendra n. Singh, Electrophysiology Laboratory, Department of Pharmacology and Toxicology, National Institute of Pharmaceutical Education and Research (NIPER), Sector-67, SAS Nagar (Mohali)-160062 Punjab E-mail: jitnsingh@gmail.com, jnsingh@niper.ac.in

## Study of Cardiovascular Reactivity to Mental Stress in Different Phases of Menstrual Cycle

P122

Jnaneshwara P Shenoy<sup>1\*</sup>, Sahana A<sup>2</sup>, Shivakumar J<sup>3</sup>.

<sup>1</sup>Department of Physiology, Father Muller Medical College, <sup>2</sup>Student, MBBS Phase II, Father Muller Medical College, <sup>3</sup>Department of Physiology, KIMS, Hubli

**Aims and Objectives:** The main objective of this study was to determine whether the follicular and luteal phases of menstrual cycle exhibit variations in cardiovascular reactivity to a mental stress challenge in young healthy women.

**Methods:** The study group comprised of 30 healthy women in the age group of 18-25 years satisfying the inclusion criteria. Blood pressure was recorded and heart rate obtained from ECG recordings in follicular and luteal phases of menstrual cycle. The mental stress protocol used in this study was the serial subtraction task. The results were analysed using the students paired 't' test.

**Results:** The women included in the study produced the well known reactivity to mental stress, in terms of blood pressure (SBP and DBP) and heart rate increases, but the two phases of menstrual cycle were indistinguishable insofar as reactivity patterns are considered. The resting values of these cardiovascular parameters were also alike during the two phases.

**Conclusion:** We were unable to find any differences in cardiovascular reactivity to serial subtraction task during the course of a normal menstrual cycle. This shows that stress reactivity variations during different phases of menstrual cycle may not be due to variations in hormonal levels per se, but due to collusion of hormonal variations and unknown genetic influences.

## **Working memory deficits in patients with Mild Cognitive Impairment and Alzheimer's disease.**

P123

**John Preetham Gurja, Manjari Tripathi<sup>#</sup> and Ratna Sharma\***

Department of Physiology, AIIMS, New Delhi, <sup>#</sup> Department of Neurology

**Aim:** This study compares working memory of Mild Cognitive Impairment (MCI) and Alzheimer's disease (AD) patients.

**Objective:** To assess the working memory in the patients of MCI and AD patients.

**Methods:** Seven AD, five MCI and nine MCI-I (Improved) patients participated in this study. Patient groups were categorized using Mini mental state examination (MMSE) into AD, MCI and MCI-I (MMSE score of 11-20, 21-27 & 27-30 respectively). Clinical Dementia Rating (CDR) was used to exclude severely demented subjects.

Ten common images were shown (each image for 2 s) to the subjects on monitor. After 15 sec of retention, subjects recalled the images. This procedure was repeated thrice. Total number of correct images recalled represented picture memory score.

**Results:** Picture memory scores were significantly different between MCI & MCI-I ( $p < 0.0001$ , One-way Anova with Bonferroni) and AD & MCI-I ( $p < 0.0001$ ). Scores were positively correlated with MMSE ( $p < 0.0001$ ) and negatively with CDR ( $p < 0.0001$ ).

**Conclusion:** Working memory is impaired in AD and MCI compared to MCI-I as revealed by lower performance on picture memory task. Further this impairment is in line with the overall cognitive decline assessed by MMSE and CDR.

**Keywords:** Alzheimer's disease, MCI, working memory, MMSE, CDR.

**\*Corresponding Author:** Prof Ratna Sharma, Stress and Cognitive Electroimaging Lab, Department of Physiology, AIIMS, New Delhi, Ph: 011 26504682, Email: ratnaaiims@gmail.com

## **A Comprehensive study of serum creatinine level in normal and hypertensive person**

**Jolly Bhattaharjya**

P124

Jorhat Medical College, Jorhat, Assam

**Introduction:** Hypertension is one of the most common complex disorder. Persistent hypertension is a leading cause of chronic renal failure. The only way of decreasing the disease morbidity is early detection of renal damage. One of the simple and most commonly performed RFT is to determine serum creatinine level.

**Aims & Objective:** Present study was undertaken with the aims to provide information to Clinical Physician about the importance of routine monitoring of serum creatinine in hypertensive patients for prevention of ESRD.

**Materials and Methods:** blood pressure was measured using sphygmomanometer and serum creatinine was estimated by alkaline picrate method.

**Results and observations:** in this study we have observed that there is significance difference between normal and stage1( $p<0.01$ ) and stage2 hypertensive subjects ( $p<0.01$ ), ie serum creatinine level is higher in stage 1,stage2 hypertensive cases than normal.

**Conclusion:** So from this study it is concluded that as serum creatinine level is higher in hypertensive subjects than normal subjects so routine monitoring of serum creatinine level in hypertensive patients may be recommended in daily clinical practice to prevent end stage renal disease.

**Key words:** serum creatinine, blood pressure.

### A study of heart rate in relation to BMI and waist circumference.

P125

**Jonalee Gogoi, Wasima Jahan, Rwitusmita Bharali**

Post graduate trainee, Department of Physiology, Assam Medical College, PO-AMC, PIN-786002

**Aim:** To find out effect of obesity on resting heart rate.

**Objective:** To find out heart rate in relation to BMI and waist circumference.

**Materials and Methods:** A cross sectional study was done among 69 young adults (aged 18-24yrs) of both sexes. Anthropometric measurements taken, BMI calculated & resting heart rate measured by noting the radial pulse.

**Results:** The mean heartrate was found to be  $75.90\pm 5.061$  in female,  $80.55\pm 3.929$  in male with significant increase in heart rate among males as compared to females. Heart rate of females in BMI range  $\leq 18.5$ ,  $18.5-22.9$  and  $\geq 23$  were found to be  $75.44\pm 4.33$ ,  $75.20\pm 2.387$ ,  $76.38\pm 6.12$ , respectively. Increased heart rate with BMI was observed (not statistically significant). Heart rate of males in BMI range  $\leq 18.5$ ,  $18.5-22.9$ ,  $\geq 23$  were found to be  $74.8\pm 4.147$ ,  $78\pm 1.63$ ,  $81.81\pm 3.081$  respectively. Increase in heart rate with BMI observed, but only difference between groups with BMI range  $\leq 18.5$  and  $\geq 23$  is statistically significant.

In females heart rate has a statistically insignificant positive correlation ( $r=0.018$ ) while in males there is a statistically significant positive correlation ( $r=0.376$ ) with BMI. Heart rate in females and males according to waist circumference are  $76.50\pm 4.083$ ,  $80.62\pm 3.958$  respectively (statistically significant). Heart rate of females according to waist circumference  $\leq 40$  and  $\geq 40$  are  $69.00\pm 7.071$  and  $77.04\pm 3.405$ . Heart rate increased with increase in waist circumference (statistically significant).

The heartrate of males according to waist circumference  $\leq 40$  and  $\geq 40$  are  $75\pm 3.742$  and  $81.64\pm 3.07$ . Heart rate increased with increase in waist circumference (statistically significant).

**Conclusion-** This study showed that heart rate increased with increase in BMI and waist circumference.

## Effect of Ropinirole and Bupropion on sleep in patients with restless legs syndrome

P126

Juhi Kalra\*\*, Kirti Vishwakarma\*, Taruna Sharma\*, DC Dhasmana \*, Ravi Gupta #

Department of Pharmacology\*, Department of Psychiatry# Himalayan Institute of Medical Sciences, HIHT University, Jollygrant, Dehradun.

**Aims:** To compare the efficacy of Ropinirole and Bupropion in relieving sleep disturbances in patients of Restless Legs Syndrome

**Objectives:** to assess sleep disruptions associated with RLS since sleep disturbances are common with RLS and are often the first reason for patients seeking medical advice.

**Method:** It was a Randomized, double blind Interventional study. The patients were randomly divided into 3 groups and given either Ropinirole (0.5-1mg) or Bupropion (150 mg) or Iron & folic acid and then followed up every two weeks till six weeks using Insomnia Severity Index (ISI) scale

**Result:** In our study, 84% patients complained of insomnia. A significant improvement was found in sleep from the baseline in Ropinirole ( $p < 0.001$ ) as well as in Iron and folic acid group ( $p < 0.05$ ) at 6 weeks but in Bupropion group, there was no significant improvement ( $p > 0.05$ ) at 6 weeks.

**Conclusion:** The improvement in sleep was seen much earlier i.e. at 2 weeks in the Ropinirole group than in the iron and folic acid group where sleep improved only after 4 weeks of treatment. In Bupropion group there was no significant improvement.

**Corresponding address:** Dr Juhi Kalra, Department- Pharmacology, HIMS, HIHT University, Address- 3B/4, Nemi Road, Dalanwala, Dehradun. Email address – drjuhi9@gmail.com

## Evaluation of age-related changes in 2',3'-cyclic nucleotide phosphodiesterase expression in the substantia nigra pars compacta of Asian-Indians

P127

Jyothi H.J.\*, Gowri-Manohari\*, Anita Mahadevan<sup>§</sup>, S.K. Shankar<sup>§</sup>, Trichur R. Raju\*, Phalguni Anand Alladi\*

\*Departments of Neurophysiology and <sup>§</sup>Neuropathology, National Institute of Mental Health and Neuro Sciences, Bangalore-560029, Karnataka, India.

**Aim-** To study the effect of age on 2',3'-cyclic nucleotide phosphodiesterase (CNPase) expression in human substantia nigra pars compacta.

**Objective-** Age being a risk-factor for Parkinson's disease (PD), age-associated changes in CNPase expression were studied as a measure of de-myelination.

**Methods-** 36 brains (28<sup>th</sup> gestational week-88 years) were collected at autopsy from the Human Brain Tissue Repository, NIMHANS. Serial cryosections (40 $\mu$ m) were immunolabeled for CNPase and subjected to densitometry-based image analysis using the Leica Q-Win Version-3.

**Results-** The staining intensity remained stable with age (-4.8050%), however the total stained area showed a mild reduction (8.6287%).

**Conclusion-** CNPase, a myelin protein, is expressed by oligodendrocytes and Schwann cells. The mild decrease in expression could reflect equally meagre loss of myelin in the nigra with age. Thus, demyelination may be of lesser concern in aging and PD. Alternatively this observation could be specific to our population, i.e. the Asian-



Indians. Interestingly, neuronal  $\alpha$ -synuclein pathology in PD is associated with unmyelinated/poorly myelinated axons. In the Asian-Indians, unlike the Caucasians, only a mild age-related increase in  $\alpha$ -synuclein expression is reported, therefore a negligible loss of this oligodendrocytic protein may be an additional marker of sub-threshold pathology and a reason for lower incidence of PD in them.

**Acknowledgements:** This study was supported by financial support from Indian Council for Scientific Research to PAA. [5/4-5/18/Neuro/2009-NCD-I]. We are thankful to Dr. Mariamma Philip (Senior Scientific Officer) and Dr. DK Subbakrishna (Professor and Head) Department of Biostatistics, NIMHANS for statistical analysis of the data.

**Corresponding author-** Dr. Mrs. Phalguni Anand Alladi, Senior Scientific Officer, Department of Neurophysiology, National Institute of Mental Health and Neuro Sciences

Hosur Road, Bangalore 560029. INDIA, E-mail: alladiphalguni@yahoo.com, Telephone: 91-80-26995179; Fax: 91-80-26562121

## Enhanced PFI and $VO_2$ Max among Cyclists Compared to Non-Cyclists

P128

**Jyoti P Khodnapur M.D**

Assistant Prof, Dept of Physiology, BLDEU's Shri B.M.Patil Medical college, Bijapur.

**Introduction:** Physical fitness acquired in youth and maintained throughout the life by means of an appropriate healthy life style, regular exercise and proper training schedule including habitual activity has good impact on healthy life.

**Objectives:** To compare the effect of regular exercise on physical fitness among cyclists and non-cyclists.

**Methodology:** This study included 30 cyclists from district sports school of Bijapur and age and sex matched 30 non-cyclists from Banjara school of Bijapur. Anthropometric parameters like Height (cm), Weight (Kg), body surface area ( $m^2$ ) and body mass index ( $kg/m^2$ ); Physiological parameters like Respiratory rate(cpm), Heart rate (bpm), systolic and diastolic blood pressure; Cardiopulmonary fitness parameters like Physical fitness index(PFI %), Maximum aerobic Power ( $VO_2$  Max) were recorded.

**Results:** Anthropometric parameters were significantly ( $p=0.000$ ) higher in cyclists compared to non-cyclists. Significant decrease ( $p=0.000$ ) in PR in cyclists may be attributed to increased parasympathetic activity secondary to regular exercise. Decreased ( $p=0.000$ ) in RR in cyclists could be due to increased compliance of respiratory muscles due to physical training. Cardiopulmonary fitness parameters PFI and  $VO_2$  max were highly significant ( $p=0.000$ ) in cyclists compared to non-cyclists.

**Conclusion:** We conclude by our study that cycling in students influences the cardiopulmonary Physical fitness.

**Key words:** cyclists, non-cyclists, PFI,  $VO_2$  max

**Corresponding address:** Jyoti P Khodnapur M.D, Assistant Prof, Dept of Physiology, BLDEU's Shri B.M.Patil Medical college, Bijapur-586103 E mail id: drpkjyoti@gmail.com

## Study of Cardiovascular parasympathetic functions in alcoholic liver disease patients of Assam

Jyotismita Deka, Anupi Das and <sup>3</sup>Dr.Biju Choudhury

P129

**Aims and objectives:** Next to diabetes mellitus, alcoholism is one of the common factors causing autonomic dysfunction. Very few studies have been reported from North-Eastern India evaluating cardiovascular autonomic functions in alcoholic patients. We, therefore, aimed to study the cardiovascular parasympathetic functions in alcoholic liver disease patients.

**Methods:** In this study, 60 alcoholic liver disease patients and 40 controls were subjected to three cardiovascular autonomic function tests to study the HR responses to deep breathing (Delta HR), standing (30:15 ratio) and Valsalva maneuver (Valsalva Ratio).

**Results:** 14 (23%) patients were normal, 11 (18%) early CAN, and 35 (58%) definite CAN, thus the total number of Parasympathetic damage being 76%. The mean HR response to standing (30:15) is  $0.95 \pm 0.15$  and  $1.27 \pm 0.31$ , to deep breathing is  $13.53 \pm 5.71$  and  $18.80 \pm 3.16$  and mean Valsalva ratio (VR) are  $1.17 \pm 0.09$  and  $1.25 \pm 0.02$  in case and controls respectively. The comparison between case and the control group are statistically significant ( $p < 0.05$ ).

**Conclusions:** The autonomic nervous system is affected in alcoholic liver disease with the HR response to standing being the most frequently affected one.

**Corresponding address:** Dr. Jyotismita Deka, Assistant Professor of Physiology, Gauhati Medical College, Guwahati- 781032, Phone: +919678001711, Email: drjyotismita77@gmail.com

## Study of various risk factors in clinically and electrophysiologically diagnosed patients of Carpal Tunnel Syndrome (CTS)

Jyotsna R.Thorat, A.G.Joshi and S. N. Patil

P130

**Aims and objectives-** Carpal tunnel syndrome is most common entrapment neuropathy in upper limbs. It is due to compression of the median nerve as it passes beneath the transverse carpal ligament. Various risk factors are known for CTS like hypothyroidism, arthritis, etc. Very little research work is available on the association of CTS with wrist to palm ratio and Body Mass Index (BMI).

**Method-** For present study clinical examination and nerve conduction study was carried out to confirm the diagnosis of CTS. 60 patients were studied and age matched 60 controls were studied.

Wrist circumference and anteroposterior diameter (depth) at distal flexor wrist crease was measured. Palm length was measured from distal flexor wrist crease to the tip of middle finger. Wrist palm ratio was calculated by dividing wrist depth by palm length.

Body mass index was measured by using standard formula.

All the parameters were compared with controls.

**Results:** In patients compared to controls, BMI value, hand circumference and wrist to palm ratio values were significantly increased ( $P < 0.001$ ). In patients compared to control palm length was significantly decreased ( $P < 0.001$ ).

**Conclusion—**Increased BMI and increased wrist palm ratio is associated with increased prevalence of carpal tunnel syndrome.

**\*Corresponding address:** Mrs. Jyotsna R. Thorat, Dept. of physiology, Krishna Institute of medical Sciences, Karad. Tal-Karad ,Dist-Satara, State-Maharashtra

## Effect of exposure to cement dust on lung function of workers at Barak Valley Cements limited, Badarpurghat, Assam.

Kalpojit Saikia, M. Dihingia and Dibakar Dey

Department Of Physiology, SMC

P131

**Aim and objective:** To study the effect of exposure to cement dust on FEV<sub>1</sub> % and PEFr in workers of Barak Valley Cements Limited.

**Method:** Study group consist of 29 workers of Barak Valley Cement Limited having worked for more than 5 years and control group consist of 29 staffs of Silchar Medical College having no history of exposure to cement dust. The age of the subjects ranged between 20 – 60 years. Persons who were smokers, having respiratory tract infections during the time of study were excluded. Pulmonary function was carried out using digital spirometer (Medspiror). Statistical analysis were conducted using unpaired t test keeping p< 0.05 as level of significance and data were reported as mean ±standard deviation.

**Result:** The mean FEV<sub>1</sub> % of the study group (70.83±16.47) was less than the control group (84.49±15.61). The difference was significant (p< 0.05). The mean PEFr (L/sec) in the study group (5.4±2.65) was less than the control group (6.27±1.74), though the difference was not significant (p>0.05).

**Conclusion:** Reduction in FEV<sub>1</sub> % and PEFr indicates reduction in respiratory function in the workers.

**Corresponding address:**Dr. Kalpojit Saikia, 2<sup>nd</sup> year post graduate trainee, Department of Physiology, Silchar Medical College, Ghungoor, Silchar, Assam, PIN- 788014, E-mail : saikiakalpojit@gmail.com

## N-acetyl cysteine with ascorbic acid on noise induced hearing loss - A translational Approach

Kalyanasundaram <sup>1</sup>, Gowtham<sup>2</sup>, Archana Sridharan<sup>3</sup>

1- Dept. of Emergency Medicine, Apollo Hospital ,Chennai; 2- PG Student, Dept. of Pharmacology, Chettinad Hospital Research Institute ,Chennai; 3- PG Student,Dip.N.B (ENT), KKR ENT hospital & Research Institute, Chennai

P132

The scientific review article relates to the out cry of a hardcore translational research scientist. It is the concern for a most evidence based innovative product failing to move from the laboratory bench to the bed side of the patient.

Hearing loss due to noise exposure is a common sensorineural hearing impairment in the occupation of aviation industry most specially with the ground level air traffic managers, as occupational hazard. Eventhough the mentioned personal use protective mechanical devices,the spilling over noise of moderate intensity over a period of time causes the activation of complex cascade of bio-chemical processes in the hair cells of the ear that leads to the death of the sensory epithelium, unlike high intensity causes direct mechanical damage. The generation of reactive oxygen species (ROS) , which also includes ischaemia,excitotoxic damage,metabolic exhaustion and ionic imbalance in the inner ear fluids.

The role of antioxidants in protecting the inner ear from the environmental damage has been widely studied. **N- acetylcysteine (NAC)** has been studied in a variety of in vitro and in vivo models, addressing most of the currently known mechanisms that may be associated with genesis of cochlear injury, induced by oxidative stress.

Its protective properties have already been documented against acoustic trauma in vivo using different protocols of noise exposure and variety of doses of drug. Different protocols of NAC injection dosage form, before or after noise exposure, have been compared, demonstrating that post-trauma injection offers a better protection when compared to pre-exposure treatment.

In the present study we evaluate the pharmacological addition/synergy of the Inj. N-acetylcysteine combined with Inj. ascorbic acid in as a novel approach.

The outcome of the review article strongly emphasis the **product development initiative**, (based on the substantial amount of scientific evidence) addressing the highly prevalent occupational hazard of the aviation industry, with the acquisition scope of "**Method of Use Patent**"

**Corresponding Address:** Dr. Kalyanasundaram, Dept. of Emerg. Medicine, Apollo Hospital, Chennai, email: nzram@hotmail.com

### **Comparative study of mechanical lung function measurements in COPD patients- a pilot study.**

PI33

**Kalyani Ghodeswar, Anita Agrawal, Amita Athavale, D.N. Shenvi, Sunanda Kirtikar, Dr. Jairaj Nair, Laxmi Menon.**

Seth GSMC & KEMH, Mumbai

**Aims and Objectives :** (a) Comparison of Airway Resistance by Spirometry and Maximal Inspiratory Pressures (MIP), Maximal Expiratory Pressures (MEP). (b) Assessment of Respiratory Muscle Strength using MIP and MEP.

**Methods:** Equal number of COPD patients and healthy individuals of age group  $50 \pm 20$  are taken as subjects for this study. Subjects undergone Spirometry test using a computerised machine MASTER SCREEN PFT by JAEGER. Both pre and post bronchodilator graphs are obtained. Vital Capacity (VC), Forced Vital Capacity (FVC), Forced Expiratory Volume at the end of 1 second of Expiration (FEV1) and FEV1/FVC ratio are assessed and compared. MIP and MEP tests are carried out with a computerised machine SPIRO AIR by MEDISOFT. Maximal Inspiratory Pressures (MIP) reflects the strength of the diaphragm and other inspiratory muscles while the Maximal Expiratory Pressures (MEP) reflects the strength of abdominal muscles and other expiratory muscles. This Study is in progress.

**Results:** MIP and MEP are lower in patients with COPD as Compared to the healthy subjects.

**Conclusion:** The measurement of Maximal Inspiratory Pressures (MIP) and Maximal Expiratory Pressures (MEP) indicates state of respiratory muscles. Hence it can be helpful in monitoring evolution of COPD.

**Corresponding address:** Dr. Anita Agrawal- Department of Physiology, Seth GSMC & KEMH, Mumbai. Email- anitaagrawal@kem.edu, Dr. Amita Athavale, Department of Chest Medicine & EPRC, Seth GSMC & KEMH, Mumbai. Email- amitaathavale@rediff.com

## Neurophysiological Basis of Headache

PI34

Kanika,& L.C. Thakur

Department of Neurology, G.T.B. Hospital Delhi-110095

Headache can be quite debilitating, though most of them are not caused by life threatening disorders. There are 4 main type of headache. i). Tension type ii). Migrane iii). Chronic daily type & iv ). Cluster headache.

In G.T.B Hospital Neurology OPD every day 100-150 patients come from this disorder. In about 70-75 % cases headache belong to category. 1). That is tension type in which there is tightness on both sides of head and neck with steady pain, not throbbing and this pain is not worsened by activity often complaint of stress is present before pain, though there is no nausea or vomiting or sensitivity to light, noise and motion.

About 20 % of the cases belonged to type 2). Migrane type where the patients experience pain ( Moderate to severe) lasting for few hours and in some cases even up to 2-3 days. This pain can be worsened by light, noise or motion. Some times nausea and vomiting can be present. Rest 5-10 % people have other type of headache which include cluster type, chronic headache, medication over use, sinus headache. It will be discussed in detail while presentation is done in the conference.

## Digit Ratio (2d: 4d) Predicts Sporting Ability in Elite Indian Runners

PI35

Kaninika panda, Sudhakar H H, Veena Umesh B.

KIMS, Bangalore

**Aim / Objectives:** To determine the 2D:4D ratio in elite Indian runners and compare them with non-athletes.

**Methods:** Right and left hands of 25 male runners and 14 female runners attending training camp at The Bangalore Regional Center of Sports Authority of India, were scanned. The lengths of 2<sup>nd</sup> and 4<sup>th</sup> digits were measured and their ratio calculated. Age, weight, height and BMI matched subjects (25 males & 25 females) who did not participate in any sports formed the control group.

**Results:** 2D:4D ratio was found to be significantly lower in runners compared to controls. Further differences in digit ratio between runners and controls were more in females than males (males,  $p < 0.05$ , female,  $p < 0.001$ ). However, no significant difference was seen in 2D:4D ( $\Delta r-l$ ) between controls and runners.

**Conclusion:** 2D:4D influences running performance and can be used as a tool for screening potential runners.

## Effect of acute mental and physical stress on cardiorespiratory autonomic responses between male and female medical students

PI36

Karishma Rajbhandari Pandey<sup>1</sup>, Bishnu Hari Paudel<sup>1</sup>, Kopila Agarwal<sup>1</sup>, Dipesh Raj Pandey<sup>2</sup>, Rita Khadka<sup>1</sup>

Department of Basic and Clinical Physiology<sup>1</sup> and Department of Clinical Pharmacology<sup>2</sup>, BPKIHS, Nepal

**Aims and Objective:** To compare cardiorespiratory variables (CRV) in response to acute mental (MS) or physical stresses (PS) between male and female and assess whether the given stressors have similar intensity.

**Method:** Sixty consenting students (male=30; post ovulatory female=30) age between 18-26 years were subjected to modified MENSEA questionnaire (MS) or handgrip (PS) at 12.5% of maximum voluntary contraction for 5 min. Systolic (SBP, mmHg), diastolic (DBP, mmHg), pulse rate (beats/min), and respiratory rate were recorded serially. Data were statistically analyzed.

**Results:** Compared to baseline, CRVs increased in response to MS and handgrip (PS) in both the sexes. PS at the end of 4 min produced more cardiovascular responses. Respiratory rate increased during MS, but it was not significant in response to PS in males. However, there was no significant difference in the CRV response between the sexes on exposure to MS (MENSA) or PS (12.5% MVC handgrip).

**Conclusion:** Either stress (modified MENSA cognitive questionnaire and handgrip at 12.5% of MVC) produced cardiorespiratory responses of similar magnitude both in females or males suggesting postovulatory female are comparable with their male counterparts. Physical stress tended to produce more cardiovascular responses than the mental stress, and mental stress produced more respiratory response.

## Perception of the Relevance of Hematological Practicals among Medical Teachers.

P137

**Karthiyanee Kutty<sup>1</sup>, Usha Shenoy, Vinutha Shankar, Sumitra Sudharkodhy**

Dept of physiology, Sri Devraja Urs Medical College and Research Centre, Tamaka, Kolar.

I MBBS students are taught how to perform hematology practicals where students are under stress to prick their own fingers to do the tests that are often not used later. So there is a need to assess their relevance in this era of technology and the manner in which these skills are assessed.

**Aim:** To assess the perception of the relevance of hematological practical classes conducted in the first year MBBS among medical teachers and their perception regarding OSPE

**Methodology:** A prevalidated Questionnaire was used to elicit the perception of staff from the Departments of Physiology (45), Medicine (25) and Community Medicine (9) regarding the relevance of hematological practicals conducted in the first year MBBS and their opinion regarding OSPE.

**Results:** All staff who responded perceived the use of microscope as relevant, 65% to 85% felt most experiments conducted were relevant. Only 56% of the Staff in Medicine felt that Hb estimation by Sahli's Hemoglobinometer was relevant as compared to 100% consensus in Community Medicine and 82% in physiology. 44% of Medicine staff felt performing ESR was relevant as compared to 64% by staff of Community Medicine and Physiology.

**Conclusion:** Performance of hematological practicals and its interpretation continues to be relevant in this era of technology and faculty perceived the need for introduction of OSPE.

**Corresponding address:** Karthiyanee Kutty, Dept of physiology, Sri Devraja Urs Medical College and Research Centre, Tamaka, Kolar. Email id: karthiyaneekutty@gmail.com

## The study of spirometry tests in healthy male and female adults with respect to body mass index and waist to hip ratio.

P138

**Kasturi. K. K.**

Assistant Professor, Department of Physiology, MMC&RI, Mysore

**Background and objectives:** Spirometry tests are non invasive diagnostic tests that provide measurable feedback about the function of the lungs. The aim our study is to compare the pulmonary function tests in healthy adult males and females with respect to Body Mass Index, Waist Circumference, Waist to Hip ratio, as most of the pulmonary functions are variable relation to sex and body fat distribution.

**Materials and methods:** The study was carried out on 60 healthy adult subjects consisting of 30 males and 30 females between the age group of 18 to 20 years volunteers. The anthropometric measurements like weight, height, waist circumference and hip circumference were noted and BMI, waist circumference and Waist to Hip

ratio was calculated. Spirometric measurements like FVC, FEV1, PEFr and FEF 25% - 75% were recorded and the data was statistically analysed.

**Results:** The data recorded were analysed and statistically treated by ANOVA and "t" test. It was found no significant difference in BMI (P value = 0.558), waist circumference (P value = 0.125) but there was significant difference in waist to hip ratio and weight (p-value <0.001) between the males and females subjects. With regard to spirometry tests, we found no significant difference in FEV1/ FVC (P value =0.828) but there was significant differences in the FVC (p value < 0.001), FEV1 (p value < 0.001), PEFr (p value < 0.001) and FEF 25-75 (p value < 0.001), between the male and female subjects.

**Conclusions:** The findings of present study show that there is a reciprocal relation between spirometric values with respect to BMI and waist hip ratio this may be due to an increase in total respiratory resistance and airway resistance with increasing body mass due central fat deposition. The higher BMI and Waist to hip ratio the higher will be the airway resistance, subsequently, the lower FVC, FEV1, FEF25% -75% and PEFr. These findings suggest that females having more central fat deposition with lower spirometric values.

**Corresponding address:** Dr. Kasturi. K. K. MD, Assistant Professor, Department of Physiology, MMC&RI, Mysore 570020, Karnataka, India, Mobile:- 9449408940, E-mail :- kasturikk75@yahoo.in

## A comparative study of efficacy of aliskiren as an add-on therapy to olmesartan versus olmesartan monotherapy in patients with hypertension

P139

**Kaushal J\*, Rajkumar J\*, Aggarwal HK\*\***

Department of Pharmacology\*, Pt. B. D. Sharma PGIMS, Rohtak; Department of Medicine\*\*, Pt. B. D. Sharma PGIMS, Rohtak

**Objectives:** To compare the efficacy of aliskiren as an add-on therapy to olmesartan versus olmesartan monotherapy in patients with hypertension.

**Methods:** A prospective, open labeled, randomized, comparative, clinical study was conducted on 30 patients. The patients were randomly divided in two groups of 15 each to receive either of the following two treatments: Group I: Olmesartan 40mg OD as monotherapy and Group II: Aliskiren 150mg OD as an add-on therapy to Olmesartan 40mg OD for 8 weeks. End points of efficacy were mean sitting SBP and DBP, mean standing SBP and DBP, mean recumbent SBP and DBP, and 24-hr proteinuria which were assessed at 0, 2, 4 and 8 weeks.

**Results:** There was statistically significant reduction (p<0.001) in mean blood pressure (mm Hg) in both the groups over a period of 8 weeks. However, on comparing both the groups at 8 weeks, more fall in BP was observed in group II as compared to group I. The values of mean reduction in BP in group II Vs group I respectively are as follows: mean sitting SBP (29.73 Vs 21.06), mean sitting DBP (14 Vs 11.06), mean standing SBP (28.53 Vs 24.13), mean standing DBP (13.86 Vs 10.8), mean recumbent SBP (29.46 Vs 25.86) and mean recumbent DBP (13.73 Vs 10.8). Moreover, reduction in 24-hr proteinuria (g/day) was also more in group II as compared to group I (0.06 Vs 0.04) respectively.

**Conclusion:** Thus combination therapy of olmesartan and aliskiren produces additional reduction in blood pressure compared to monotherapy and has better anti-proteinuric effect.

**Corresponding address:** Dr Jyoti Kaushal, Professor, Dept of Pharmacology, Pt. B. D. Sharma PGIMS, Rohtak Ph: +919896149454 E-mail: kaushaljyoti@yahoo.co.in

## Chronic suppurative otitis media in juvenile and young adult: effect on auditory brainstem evoked potential.

P140

**Kaushik Roy, Anilbaran Singhamahapatra, Bulbul Mukhopadhyay, Somnath Saha, Santanu Dutta.**

**Introduction:** Chronic suppurative otitis media (CSOM) is a very common cause of conductive deafness. In a number of studies on animal show reversible Auditory Brainstem Evoked Potential (AEP) changes. Several studies in children with Otitis Media with effusion shows changes in wave III, V and Interpeak latency of I-V, III-V. A study of adult shows increase latency in wave V and interpeak interval of I-V, III-V.

**Aims & Objectives:** To investigate the effect of CSOM on AEP.

**Methods:** 20 patients with CSOM (unilateral/bilateral), age group of 6 – 35 years, who have attended the ENT OPD at R.G Kar Medical College Kolkata were subjected to **Auditory brainstem Evoked potential test.**

**Results:** As the patients with unilateral and bilateral disease has been included in the study, therefore the number of disease ears have been considered as unit and it has been compared with the total number of normal ear among controls and patients. Our results show an increase in wave **I** only.

**Conclusion:** In conductive deafness there is loss of amplification and phase difference as the sound falls on round and oval window simultaneously, and results in the delay in wave I.

**Corresponding address:** Dr. Kaushik Roy, Dept. Of Physiology, R G KAR Medical college, 1.Khudiram Bose Sarani, Kolkata-700004, e-mail: roy.drkaushik@gmail.com, ph - 9433092513

## N Acetyl Cysteine – Neuroprotective role against prenatal stress induced changes in learning and memory.

P141

**Kavitha Bernhardt,<sup>2</sup>Sampath Madhyastha**

<sup>1</sup>Department of physiology, MMMC, Manipal University, Manipal, Karnataka, India, 576104, <sup>2</sup>Department of Anatomy, KMC, Mangalore

**Objectives:** Present study was aimed to evaluate the neuroprotective role of N Acetyl Cysteine supplementation against prenatal restrain stress induced impairment of learning and memory in rat offspring.

**Methods:** Adult female rats were allowed to mate with fertile male rats, after which pregnancy was confirmed, The pregnant rats were randomly allocated into four groups (1) Control (2) N Acetyl Cysteine (NAC) treated rats (3) Stress induced rats (PS) (4) Stress induced rats treated with NAC(PS-NAC);(n=6 in all groups). Data was analyzed using one way ANOVA, followed by Bonferroni's post test.

The offspring of all groups were weaned at 21 days. Four pups from each litter (two male and two female) were subjected to passive avoidance test on day 42 and 63, for evaluation of learning and memory.

**Results:** In passive avoidance test during exploration there was no significant difference between offspring of PS-NAC and of PS, however, during retention test offspring of PS-NAC spent significantly less time in small compartment. There was no significant difference between offspring of PS-NAC and control group.

**Conclusions:** From the results of present study it can be concluded that the learning and memory of offspring is affected by prenatal stress and NAC has reversed this neurotoxic effect.

**Corresponding address:** <sup>1</sup>Department of physiology, MMMC, Manipal University, Manipal, Karnataka, India, 576104, E-mail: liz.kavitha@manipal.edu



## Relationship of Anthropometric Measures of Central Obesity (Waist Circumference , Waist-Hip- Ratio, Waist- Stature- Ratio) with Blood Pressure

P142

Keshav Kashyap, B.P.Tikariha

Department of Physiology, Pt. JNM Medical college, Raipur (C.G.)

**Aims and Objectives:** To assess the correlation of waist circumference, waist-hip-ratio and waist -stature-ratio with Blood pressure. To find out best anthropometric index as a predictor of hypertension.

**Method:** Total 600 subjects (335 male and 265 female) aged 18 yrs and above from Pandri, Raipur were included in the present cross sectional study. To determine WHR and WSR; Height, waist circumference and hip circumference were measured as per recommendation of "WHO STEPS for surveillance (2008) protocol . Subjects were classified as hypertensives or normotensives as per JNC- 7 recommendations. Results were analysed by mean, standard deviation, Students T test and Pearson Correlation analysis.

**Results:** Mean values of anthropometric indicators were significantly higher in Hypertensive than in normotensive population. Prevalence of Hypertension was more in obese category than non obese category for all anthropometric indicators. Percentage of hypertensive detected by WSR was highest (71.63%) followed by WC (69.54%), WHR (60%). A positive correlation was found between anthropometric indicators with SBP and DBP.WSR had the highest correlation coefficient for both SBP as well as DBP followed by WC > WHR in that order.

**Conclusion:** WSR was found to be superior to WC and WHR for prediction of Hypertension.

**Corresponding address:** Dr. Keshav Kashyap; Asst. Prof., Dept of Physiology, Late LAM Medical College, Raigarh,C.G. Contact no. - 09179859100, Email ID - keshu.kashyap@gmail.com

## Symptomatic and asymptomatic patients of orthostatic hypotension have distinct pattern of autonomic dysfunction.

P143

Khandelwal Ekta<sup>1</sup>, Jaryal Ashok kumar<sup>2</sup>, Deepak KK<sup>2</sup>

Department of Physiology, All India Institute of Medical Sciences, Raipur<sup>1</sup>

Department of Physiology, All India Institute of Medical Sciences, New Delhi<sup>2</sup>

**Aim and Objectives:** Cardiovascular autonomic neuropathy leading to orthostatic hypotension is a known complication of the Type 2 diabetes mellitus. However, not all patients of orthostatic hypotension (OH) develop symptoms. The present study was done to compare autonomic dysfunction in patients of OH with or without symptoms in type 2 diabetes mellitus.

**Methods:** Thirty patients of type 2 diabetes presenting OH with symptoms (n = 16) or without symptoms (n= 14) were recruited. The sympathetic and parasympathetic function was determined by standard battery of autonomic function testing. Mann Whitney test and Student's t test were used for statistical analysis.

**Results:** The symptomatic patients of OH had larger fall in SBP in lying to standing test 30(21-46.5)vs 22(20-27), p=0.39. The test of sympathetic function namely HGT 11(2.5-11)vs10(10-16.5),p= 0.002 and CPT 6(4-9.5)vs11(10-18),p= 0.001 also show larger dysfunction in symptomatic as compared to asymptomatic patients. On other hand, the symptomatic patients had smaller dysfunction of parasympathetic function VM (1.30±0.37vs1.19±0.21,p=0.29)

**Conclusions:** The data suggests a distinct pattern of autonomic dysfunction in symptomatic and asymptomatic OH patients of type 2 diabetes mellitus. The symptomatic patients have predominant sympathetic autonomic dysfunction while the asymptomatic have predominant parasympathetic dysfunction.

**Corresponding Address:** Dr Ashok Kumar Jaryal, Additional Professor, Department of Physiology, AIIMS, New Delhi, Email: ashok.jaryal@gmail.com

## **Mean platelet volume and other platelet volume indices in patients with stable coronary artery disease and acute myocardial infarction: A case control study.**

P144

Khode V, Sindhur J, Kanbur D, Ruikar K, Nallulwar S.

Department of Physiology, SDM College of medical sciences, Sattur, Dharwad, Karnataka, India.

**BACKGROUND:** Coronary artery disease is mainly caused by atherosclerosis and its complications. Platelets and their activity have an important role in initiation of atherosclerotic lesions and coronary thrombus formation. Larger platelets are enzymatically and metabolically more active and have a higher potential thrombotic ability as compared with smaller platelets.

**AIMS:** To study the changes in platelet volume indices and platelet count in acute myocardial infarction, stable coronary artery disease and compare them with controls to assess their usefulness in predicting coronary events.

**MATERIALS AND METHODS:** This was a comparative study of 128 subjects; 39 patients with acute myocardial infarction (AMI), 24 patients with stable coronary artery disease (SCAD) and 65 controls. Venous sample were drawn from AMI subjects on admission (within 4 hours of chest pain) and collected in standardized EDTA sample tubes. Platelet count and volume indices were assayed within 30 minutes of blood collection, using Sysmex KX21-N autoanalyzer. Venous samples were also drawn from SCAD on who were admitted for angiography and subject attending routine checkups.

**RESULTS:** The mean platelet volume was significantly higher in patients with AMI ( $9.65 \pm 0.96$ ) as compared to SCAD ( $9.37 \pm 0.88$ ) and controls ( $9.21 \pm 0.58$ ). The best cut-off values for MPV when predicting AMI and SCAD in patients were 9.25 fl (sensitivity 56.4%; specificity 45.9%) and 9.15 fl (sensitivity 54.2%; specificity 42.23%), respectively.

**CONCLUSIONS:** Measurements of MPV may be of some benefit in detecting those patients at higher risk for an AMI and CAD.

**KEYWORDS:** Acute myocardial infarction, coronary artery disease, mean platelet volume

Dr Vitthal khode, Assistant professor, Department of Physiology, SDM College of medical sciences, Sattur, Dharwad 580009

## **Cerebrovascular reactivity and systemic vascular reactivity in the patients of type 2 Diabetes Mellitus**

P145

**Kiran Prakash, MD\***; **Dinu S Chandran, MD\***; **Ashok Kumar Jaryal, MD\***; **Rajesh Khadgawat, DM#**; **Kishore Kumar Deepak, MD, PhD\***

\* Department of Physiology, All India Institute of Medical Sciences, New Delhi; # Department of Endocrinology & Metabolism, All India Institute of Medical Sciences, New Delhi

**Aims and Objectives:** Type 2 diabetes mellitus (DM) is associated with endothelial dysfunction and therefore impaired vascular reactivity both at the systemic as well as cerebral level. The present study estimated the systemic vascular reactivity (SVR) and cerebrovascular reactivity (CVR) as well as their correlation in the patients of type 2 Diabetes Mellitus.

**Methods:** Thirty six patients of type 2 DM were recruited. SVR was assessed by calculating percent maximum change in peripheral pulse wave amplitude, using photo plethysmography during reactive hyperaemia. CVR was assessed by calculating percent maximum change in blood flow velocity of middle cerebral artery using Transcranial Doppler Ultrasound after breathing of 7% CO<sub>2</sub>.

**Results** Maximum changes in pulse wave amplitude during reactive hyperaemia are 23.98 (interquartile range 9.12 – 50.02) %. Cerebrovascular reactivity after breathing of 7% CO<sub>2</sub> is 48.78 ± 23.59%. No significant correlation was found between systemic vascular reactivity and cerebrovascular reactivity.

**Conclusion** The present study concludes that there is no significant correlation between systemic vascular reactivity and cerebrovascular reactivity, therefore systemic and cerebral vascular functions should be assessed separately in the patients of type 2 DM.

**Corresponding Author:** Dr. Ashok Kumar Jaryal, MD, Additional Professor, Department of Physiology, 2nd floor, Teaching block, All India Institute of Medical Sciences, New Delhi, India, 110029. Email: ashok.jaryal@gmail.com, Telephone: +919350041957, 91-11-26594812, Fax: 91-11-26588500

## Lecture plus SDL better than SDL only?

P146

**Kirtana M Pai, Dhiren Punja, Ragavendra Rao**

Department of Physiology, Kasturba Medical College, Manipal

**Background:** Newer learning methods like Problem based learning (PBL) and Self directed learning (SDL) have emerged in medical curriculum. This study was undertaken to assess the impact of supplementing a lecture to SDL session, on a topic in Physiology.

**Aims and Objectives:** The primary aim was to find out benefit of combining SDL with traditional lecture.

**Methods:** The two batches of first year MBBS (Batch A & Batch B) consisting of 125 students each, received an SDL session in the area of Haematology, specifically with respect to *morphological classification of anemia*. The students belonging to Batch A received a lecture on the same topic 3 days prior to SDL session. The students were given ten multiple choice question test for a maximum of 10 marks, immediately following SDL session.

**Results:** The mean test scores were 4.38±2.06 (n=119) and 4.17±1.71 (n=118) for Batch A and Batch B respectively. There was no significant difference between the groups.

**Conclusions:** The batch of students with self directed learning only, performed almost equal to the group of students who were supplemented with a lecture to SDL session.

**Corresponding address:** Dr Kirtana M Pai, Associate Professor, Department of Physiology, Kasturba Medical College, Manipal-576104, Fax: 91 8202570062, Email: kirtana.pai@manipal.edu

## Short term pranayama practice affects the exercise capacity in stable COPD

P147

**Krishna Kumar.S, Anjana Talwar, and Randeep Guleria**

Department of physiology, Chennai medical college & research centre (SRM group), Irungalur, Trichy.

**Objective:** To investigate the effect of pranayamic breathing exercises on exercise capacity in Chronic Obstructive Pulmonary Disease (COPD)

**Method:** A total of 44 patients with moderate-to-severe COPD were classified into two Groups. In Control group, 21 COPD patients were recruited and they continued with their usual physical activity along with their routine medications for six weeks. In study group, 23 subjects were recruited and they practiced pranayamic breathing exercises namely Alternate Nostril Breathing, Right Nostril Breathing, and Left Nostril Breathing along with routine treatment for six weeks. The primary outcome measures were weight, FEV<sub>1</sub>, Dyspnoea scores, and Peak Vo<sub>2</sub>. Modified BODE scores were calculated from the above said outcome measures. These measures were evaluated again after 6 weeks in both the groups.

**Results:** After 6 weeks of pranayama in the study group, there was a significant reduction in BMI ( $P=0.037$ ), increase in FEV<sub>1</sub> values ( $P=0.0032$ ), decrease in dyspnoea score ( $P=0.0162$ ), increase in peak Vo<sub>2</sub> value ( $P<0.001$ ) and decrease in Modified BODE index scores ( $P<0.001$ ).

**Conclusion:** In the present study, a significant reduction in Modified BODE scores in COPD patients have been observed following six weeks of Pranayama. Thus, Pranayama may be included as a part of rehabilitation in COPD patients to improve health outcomes.

**Corresponding address:** Dr.S.Krishna Kumar MD, Assistant Professor, Department of physiology, Chennai medical college & research centre (SRM group), Irungalur, Trichy-621105. Mobile no.08344342152, Email:tallboykk@gmail.com

## Evaluation of Student's feedback on E-module developed by undergraduatemedical students

Krishnan.S1, Archana P Kumar1, Vamsi Krishnan1, Rohit Reddy1, Padmavathi.R1

P148

1Department of Physiology, Sri Ramachandra University, Porur, Chennai

**Introduction:** E-learning is one of the emerging tools which has been integrated in many university programs. There are several factors that need to be considered while developing E-learning modules especially the student's perspective. Involving students in developing such E-modules may bring in their current perspective and make it more user friendly.

**Objective:** To analyse the Student's feedback on E-module developed by second year medical students

**Materials and Methods:** After getting Institutional Ethical Clearance, two second year medical students developed an E-module on Physiology of High altitude using Adobe Flash software CS5. After getting informed consent, the E-module was shown to 214 (56 males, 121 females) first year medical students. A structured and validated feedback questionnaire consisting of 9 closed end and 3 open ended questions was administered to all of them. The data was analyzed using SPSS software version 10.

**Results:** 99% felt that objectives were clearly defined, 64% felt appropriate graphics and animations were used, 82% responded that self assessment was useful, 63% of participants said that appropriate graphics and animations were done, 63% felt that E-module suited their learning style and 69% of participants wanted more E-modules to be added to their curriculum.

**Discussion and Conclusions:** Having a team of faculty, students and technical experts (multimedia and animation) may be more beneficial in preparing E-modules which can be viewed as a form of teaching-learning method.

**Corresponding Address:** Dr. S.Krishnan, II Year Post graduate Student, Department of Physiology, Sri Ramachandra University, Porur, Chennai 600116., Mail Id: drkrish10@gmail.com

## Adiponectin, Interleukin-6, and Endothelin-1 Correlate with Cardio-metabolic Risk Factors in Overweight/Obese Men

P149

Kumar Sarvottam, Ritesh Kumar Netam, Dipti Magan, Raj Kumar Yadav

Integral Health Clinic, Department of Physiology, All India Institute of Medical Sciences, New Delhi, India

**Background:** Obesity is now recognized as an independent cardio-metabolic risk factor, and has a direct influence on endothelial function, blood pressure, glucose tolerance, and lipid profile. Adiponectin is released from adipose tissue and increased adiposity paradoxically decreases adiponectin (1,2). Adiposity causes upregulation of various adipocytokines including interleukin-6 (IL-6) (3) and endothelin-1 (ET-1) (4). IL-6 is an independent predictor of cardiovascular diseases (5) and ET-1 is an important link in pathogenesis of systemic hypertension in obese individuals. The objective of this study was to assess the correlation of biomarkers of adiposity (adiponectin), inflammation (IL-6) and endothelial dysfunction (ET-1) with cardio-metabolic risk factors i.e. body mass index (BMI), blood pressure, fasting blood glucose, and lipid profile.

**Methods:** Overweight/obese (BMI taken per Asian cut-off values) men (n=27) with mean age of 39± 12.2 years, were recruited from a lifestyle intervention program intended at weight reduction. BMI, systolic and diastolic blood pressure (SBP and DBP), lipid profile, fasting blood glucose (FBG), IL-6, adiponectin, and ET-1 were assessed. Statistical analysis was performed using SPSS Version 16.0. Statistical analyses included tests of correlation (Spearman's rho correlation). The study was registered at Clinical Trial Registry India (CTRI/2012/02/002396).

**Results:** The mean BMI of the subjects was 26.40±2.54 kg/m<sup>2</sup>, and the mean fasting blood glucose was 108.92±12.66 mg/dL. The mean SBP was 121.15±11.52 mmHg, and LDL cholesterol and triglycerides were 98.38±27.70 mg/dL and 149.80±52.54 mg/dL, respectively. The median levels of adiponectin, IL-6, and ET-1 were 4.95 µg/mL, 2.24 pg/mL, and 0.84 fmol/mL, respectively. Adiponectin correlated inversely with LDL-cholesterol and LD/HDL ratio (r=-0.390, p=0.049 and r=-0.463, p=0.017, respectively). Significant positive correlation was observed between IL-6 and FBG (r=0.566, p=0.003). ET-1 correlated positively with pulse rate, SBP and DBP (r=0.546, p=0.005; r=0.516, p=0.008; r=0.412, p=0.032, respectively). Borderline negative correlations were observed between IL-6 and HDL-cholesterol, and positive correlation with LDL cholesterol.

**Conclusions:** Adiposity was associated with unfavorable lipid profile, and IL-6 levels increased with increasing fasting blood glucose suggesting that IL-6 was related to insulin resistance. Also, it was observed that ET-1 was associated with an unfavorable cardiovascular profile such as elevated blood pressure and pulse rate.

## A Correlative study of thyroid dysfunction and infertility

P150

Lakshmi G, Assalatha and Sumaprabha KS

**Aims and Objectives:** Infertility affects approximately 15% of couples in the world. 35% infertility are due to female causes and among female causes, 59% contributed by ovarian dysfunction. There is a direct impact of thyroid hormone level on luteal function of the ovary. So the thyroid function studies should be part of the evaluation of patients with persistent menstrual disorders. This inspired us to probe into this topic.

**Methods:** In the prospective study, a group of fifty female patients with irregular periods attending the infertility clinic at SAT Hospital selected as cases. Control group comprise fifty patients with regular periods of the same age group. The following parameters were studied – family history of thyroid dysfunction, body mass index, recent weight gain, serum thyroxine, triiodothyronine, thyroid stimulating hormone, prolactin. Thyroid hormones, thyroid stimulating hormone and prolactin estimated by radioimmunoassay. Statistical analysis was done using Pearson Chi-square test.

**Results:** Cases has positive family history of thyroid dysfunction (8%), high body mass index (50%), recent weight gain (42%), high serum prolactin level (22%) (N-5-25 ng/ml). 72% cases were euthyroid with normal thyroid hormones levels. 28% cases had clinical hyperthyroidism. Among 72%, 6% subclinical hyperthyroid (Normal T3, T4 and low TSH) ( $0.6 \mu\text{IU/L}$ ), 8% subclinical hypothyroid (normal T3, T4 and high TSH ( $>3.6 \mu\text{IU/L}$ )).

**Conclusion:** Estimation of serum TSH proves to be the most sensitive index of thyroid failure among other thyroid function tests. Hyperthyroidism or hypothyroidism, whether clinical or subclinical has definite role in infertility. So routine screening of TSH along with thyroid hormone is strongly recommended in the investigation for infertility.

**Key words:** infertility, clinical hyperthyroidism, subclinical hyperthyroidism, subclinical hypothyroidism.

## Study of cardiovascular autonomic functions in reproductive and post-menopausal women

Lakshmi Priya M

P151

**Aim:** To assess cardiovascular autonomic status of reproductive and post- menopausal women

**Objectives:** To statistically evaluate the cardiovascular autonomic functions of the said group and suggest remedial methods to compensate for imbalance if any

**Materials and methods: Study design:** Cross sectional study, **Study period:** 10 months, **Study population:** Women of reproductive and post- menopausal age group,

**Sample size:** 40 from each group, **Parameters studied:** Blood pressure response to Postural variation & Hand grip; Heart rate response to Deep breathing, Valsalva & Postural variation, **Inclusion criteria:** Women between 20 & 40 years. Women who have attained menopause at least 2 years before. **Exclusion criteria:** Pregnant and lactating women, Women with history of any illness, on hormone therapy Induced menopause.

**Study procedure:** Autonomic functions were assessed on the basis of Ewing's criteria, ECG (portable digital ECG machine), Hand grip (hand grip dynamometer), Blood pressure (Sphygmomanometer) and Valsalva (Anaeroid manometer). Statistical analysis by independent 't' test.

**Result:** Statistical work to be completed. However there are pointers towards significant findings suggestive of autonomic imbalance in post-menopausal women.

## Effect of sitagliptin on neurobehavioural parameters in animal models.

Lalit Kumar Gupta, Mayur Kamble, Harmeet Singh Rehan

P152

Department of Pharmacology, Lady Hardinge Medical College & Smt. S.K. Hospital, New Delhi.

**Aim:** In this study, sitagliptin was evaluated for its potential role in various neurobehavioral parameters.

**Material & Methods:** Tests were done in Wistar rats/ Swiss albino mice. Effect on anxiety behavior was assessed using open-field test and elevated plus maze (EPM), effect on depression was assessed using despair-swim test (DST) and effect on memory was assessed using Morris water maze (MWM).

**Results:** There was no significant difference in number of central squares and peripheral squares crossings in sitagliptin group compared to control group. In EPM, number of closed and open arm entries were similar in sitagliptin and control groups. In DST, the duration of immobility was significantly reduced in sitagliptin group compared to control group ( $P \leq 0.05$ ). In MWM, trials through day 1-4 showed learning phenomenon. Scopolamine

administration prior to day 4 trial caused significant increase in escape latency which was reversed by prior sitagliptin administration.

**Conclusion:** Sitagliptin has no effect on anxiety behavior while it produces significant improvement in animal models of depression and learning and memory.

**Corresponding address:** Lalit Kumar Gupta, Department of Pharmacology, Lady Hardinge Medical College & Smt. S.K. Hospital, New Delhi 110001, Fax: 91-11-23340566, E-mail address: lkg71@rediffmail.com

## Role of yoga training on cardiopulmonary fitness in cyclists

P153

**Lata.M. Mullur M.D**

Associate Prof, Dept of Physiology, Bldeu's Shri B.M.Patil Medical College, Bijapur.

**Need of study:** Yoga is an ancient discipline designed to bring balance and health to the physical, mental, emotional and spiritual dimensions of the individual. Exercise training programs can increase strength and improve sub maximal force control, but the effects of yoga as an alternative form of steadiness training are not well described.

**Objective:** To find out beneficial effects of yoga training on cardiopulmonary fitness in cyclists.

**Materials and Methods:** The study was conducted on 24 (12 study group, 12 control group) healthy cyclists in the age group 10 to 14 years from District Sport School of Bijapur. The parameters recorded in each subject before and after the intervention were: Ht(cms), Wt (kg), BSA (m<sup>2</sup>), BMI (Kg/m<sup>2</sup>), RR(cpm), HR(bpm), SBP( mmHg), DBP( mmHg), PFI (%), VO<sub>2</sub> Max (ml/kg/min).

**Results:** In study group, PFI (%) is 87.87+8.55 before & 96.24+ 7.18 after yoga intervention. VO<sub>2</sub> Max (ml/kg/min) is 49.31+ 7.06 before & 56.76 + 6.46 after yoga intervention. Statistically significant increase in PFI(p=0.004), VO<sub>2</sub> Max(p=0.04) were observed after yoga training.

**Conclusion:** Yoga is a great low-impact way to cross train. Adding new exercises can help reduce injury, relieve training boredom, add variety and help recover from hard aerobic or strength workouts.

**Key words:** Yoga, cyclists, VO<sub>2</sub> max, PFI

**Corresponding address:** Lata.M. Mullur M.D, Associate Prof, Dept of Physiology, Bldeu's Shri B.M.Patil Medical College, Bijapur. Email id: drlatamullur@gmail.com

## A comparative study of pulmonary function test amongst school children of industrial & non industrial areas of Raipur (C.G.).

P154

**Latiyar Anil, Verma S.**

**Aims and Objectives:-**To study & compare the PFT in school children of Industrial area and non-Industrial area & assess the degree of lung function impairment amongst school children of industrial area.

**Materials and methods:-**The study was conducted in a school of industrial area (Birgaon, Urla) & non industrial area (Mana Camp) from Apr. to Aug. 2012 in Raipur (C.G.). Children included were healthy 200 cases & 200 controls between 11-18 yrs. Exclusion criteria include children having previous h/o PTB and RTI 4 weeks prior to spirometry. Computerized Spirometric evaluation done through HELIOS 501 after measurement of Height & Weight.

**Results:**-On Comparison of Cases with Controls, Spirometric parameter FVC, FVC in relation with Age, FEV<sub>1</sub>, FEV<sub>1</sub>/FVC & Lung Age were found to be significant ( $p < 0.05$ ). PEF, FEF<sub>25%-75%</sub>, FEF<sub>25%</sub> & FEF<sub>50%</sub> were Not significant ( $p > 0.05$ ).

**Conclusion:**-There was significant deficit in Spirometric parameters indicative of mixed pattern (both restrictive and obstructive) lung impairment in industrial area children.

**Correspondence address:** Dr Anil Latiyar, 253, 3<sup>rd</sup> Floor Masjid Moth, South Extension-2, New Delhi -49, **E-mail-** anillatiyar@yahoo.com **Mob.** 9718249060

## Sports training and serum osteocalcin in young athletes of Manipur

P155

**Leivon Bellamy Kom, Ksh. Gomti Devi.**

RIMS, Imphal, Manipur

**Aims:** To assess the effect of sports training on serum osteocalcin.

**Objective:** Effect of sports training on serum osteocalcin and to see the relationship with sex and with the types of sports of the participants.

**Methods:** This preliminary study was conducted in the Department of Physiology, RIMS. 50 young athletes (25 women and 25 men) ages ranging from 18 to 21 years were selected from Sports Authority of India, Manipur; the sedentary age-matched controls (N=10) were selected from the general medical student population. Serum osteocalcin was estimated using EDM™ Osteocalcin(1-43/49) Specific ELISA Kit, Epitope Diagnostics, Inc. USA.

**Results:** Mean±SD serum osteocalcin concentration in the sportspersons was 22.97±6.36 and in controls was 11.68±5.60. In male it was 26.07±5.29 and in female 19.88±5.89. In hockey players (N=21) serum osteocalcin level was 23.94±6.14, runners (N=18) was 23.87±6.26 and in cyclist (N=11) it was 19.62±6.38.

**Conclusion:** The findings suggest mean serum osteocalcin, a bone formation marker, are higher in sportspersons and also higher in males but no significant differences among the different types of sports included in the study.

## Comparative study of the effect of treadmill exercise on pulmonary function tests in healthy young adult males in guwahati city

P156

**Loken Buragohain, Shrabani Barman, Biju Choudhary, Bonti Bora**

Department of Physiology, Gauhati Medical College.

**Aims:** The aim of the study is to compare the effect of treadmill exercise on various pulmonary function tests (RR, FVC, FEV<sub>1</sub>, FEF<sub>25-75%</sub>, PEF) in healthy young adult males in Guwahati city.

**Objectives:** The objective of the study is to find out whether treadmill exercise has any beneficial effects on the respiratory system.

**Methods:** This cross sectional population based study was conducted on 50 healthy adult males between age group of 19 -35 years. They were non-athletes, non-smokers, non- alcoholic and not doing any regular exercise. Out of 50 subjects, 25 taken as study group were made to perform treadmill exercise regularly for 20-30-minutes after 5 minutes of warm up exercise in a gymnasium for 12 weeks under the supervision of an experienced instructor. The control group was not involved in any type of physical exercise. A pulmonary function test was done with spirometer (MEDSPIROR) in both the groups in comfortably seating position. PFT was recorded for 3 times and the best results were taken into consideration.



**Results:** The results were analysed for statistical significance using the unpaired t-test and the data were reported as Mean  $\pm$  Standard Deviation. In the study group all the spirometric parameters (RR, FVC, FEV<sub>1</sub>, FEF<sub>25-75</sub>%, PEFR) were higher than the control group and is significant ( $p < 0.05$ ).

**Conclusion:** From this study we can conclude that regular treadmill exercise or aerobic exercise improves the efficiency of the respiratory system.

### Evaluation of cognitive performance of 2<sup>nd</sup> MBBS students after pharmacology theory classes with various teaching aids

P157

MSM Bashir, Ajay Khade

**Background:** Lecture delivery method in medical colleges is changed due to use of audiovisual aids. But it is said that concentration levels never remain same during entire one hour theory class due to impairment of cognitive performance. Hence the study was conducted to assess cognitive performance after pharmacology theory classes having various teaching aids. **Materials & Methods:** Performance of twenty 2<sup>nd</sup> MBBS students was evaluated using objective (six digit cancellation, digit symbol substitution, arithmetic ability) and subjective (visual analogue scales) tests before and after one hour pharmacology theory classes in which Over Head Projector (OHP), Power Point (PPT) or Black Board (BB) was used as teaching aid. **Results:** Statistically significant ( $p < 0.05$ ) impairment in the objective performance was observed after attending the Over Head Projector (OHP), Power Point (PPT) and Black Board (BB) classes. Alteration in the performance was not significant after attending the classes with OHP along with BB and PPT along with BB. Subjective performance was impaired after attending PPT, OHP, BB and OHP along with BB classes. **Conclusion:** It can be concluded that pharmacology lecture delivery method is best if PPT or OHP is mixed along with BB during the class and cognitive performance is best after attending such classes.

**Corresponding Address:** Dr. MSM Bashir, Department of Pharmacology, Rajiv Gandhi Institute of Medical Sciences (RIMS) Adilabad. A.P. 504001, **Email:** drmsmbashir76@rediffmail.com

### Cardiopulmonary assessment of middle aged subjects at high altitude and its correlation with exercise

P158

M. Bhima Bhat, Dr. Aswini Dutt.R, Dr. K. Shankar Bhat

Department of Physiology, Yenepoya Medical College, Deralakatte, Mangalore, 575018. Karnataka, India

**Introduction:** Peak Expiratory Flow Rate (PEFR) measures how fast a person can exhale air. It is one of the many tests that measure how well our airways work. Various factors like age, gender, Body Mass Index, exercise, cardiac health and high altitudes alter PEFR.

**Aims and Objectives:** (1) To assess PEFR and Oxygen saturation (PO<sub>2</sub>) at increasing altitudes in middle aged individuals. (2) To study the effects of regular exercise, Blood Pressure (BP), Obesity parameters like Body Mass Index (BMI), Weight-Hip (W/H) ratio on PEFR, O<sub>2</sub> saturation.

**Methods:** 50 subjects of 40-55 year age group were included in the study. 29 males, 21 females. They were divided into two groups based on their exercise pattern. Their age, BP, BMI W/H ratio, basal PEFR using Wright flow meter and oxygen saturation using Pulse oximeter were recorded. These parameters were assessed at 7000ft, 11,000ft and 15,000 ft enroute to a pilgrimage to Himalayas.

**Results and Conclusion:** The study revealed that regular exercise regime had a significantly better PEF<sub>R</sub> and PO<sub>2</sub> in both the genders compared to non exercisers even at higher altitudes. Significantly higher heart rate, BP, lower PEF<sub>R</sub> was observed among the obese objects compared to non obese. Regular exercise and non obesity hence improves cardio respiratory fitness even in higher altitudes.

**Corresponding address:** M. Bhima Bhat, Professor, Department of Physiology, Yenepoya Medical College, Deralakatte, Mangalore, 575018. Karnataka, India. Email: drbhimbhat@gmail.com

## Prevalence of Metabolic syndrome in Adolescent females with Polycystic Ovarian Syndrome

\*M.Muhil, \*Ramani devi, \*\*P.Thirumalaikkolundusubramanian

P159

\*Chennai Medical College, Hospital & Research Centre, and \*\* Obstetrician & Gynecologist, Ramakrishna Hospital, Trichy.

**Introduction:** Polycystic Ovarian Syndrome (PCOS) is a combination of endocrine abnormalities and metabolic derangements which is one of the etiology of metabolic syndrome .

**Aim & objectives:** To find out the prevalence of Metabolic syndrome (MS), and to compare the prevalence by IDF and NCEP-ATPIII criterias.

**Material and Methods:** After getting an approval from Institutional ethics committee, an observational study was conducted during 2012 – 13. Newly diagnosed adolescent (16-19) PCOS (based on Rotterdam criteria) free from congenital adrenal disorders or on regular medications or co-morbid illness were included for the study. Height, weight, waist circumference and BP were measured. Insulin assay, fasting glucose, oral glucose tolerance test, HDL, and Triglyceride were estimated. Index of central obesity (ICO) and Insulin resistance (IR) were calculated. International Diabetic Federation (IDF) of Global Consensus Definition was used to classify the MS and compared with modified National Cholesterol Education Program-Adult Treatment Panel III (NCEP-ATP III) criteria. Data were analysed by SPSS -16 Software.

**Results :** Among the 74 Adolescent PCOS, the prevalence of MS as per IDF criteria was 15. 5% which was significantly ( $p < 0.02$ ) more than MS based on the NCEP-ATPIII (12.16%). As per the IDF criteria, low HDL, hypertriglyceridemia, elevated blood pressure, impaired Glucose tolerance, ICO, and IR were observed in 64.9, 9.5, 0.5, 10.8 12.2 and 36.5% respectively.

**Conclusion:** MS was recognized more by (new) IDF criteria than conventional (old)NCEP-ATP III. Also early recognition and intervention of MS reduces the risk of cardiovascular and diabetes related morbidity and mortality.

**Corresponding address:** M.Muhil, Dr.Ramani devi, Associate Professor, Physiology, Chennai Medical College, Hospital & Research Centre.

## Therapeutic choline supplementation has lesser competency /potency in alleviating cognitive deficits in chronic cerebral hypo-perfusion brain injury.

M. Divya Pragna<sup>1</sup>, G.Siva Kumar<sup>1</sup>, Kiranmai S Rai<sup>2</sup>

P160

1.Department of Physiology, KMC Manipal.2. Department of Physiology, I C, Manipal

**Background:** Choline loss in brain due to deficiency / insult affects neurogenesis and increases neuronal- death. Studies in transient cerebral ischemia suggest that parenteral choline administration enhances cognitive recovery.

**Objectives:** To induce chronic cerebral hypo-perfusion brain injury by bilateral common carotid artery occlusion (BCCAO).

1. To observe efficacy of therapeutic dietary choline supplementation in treating cognitive deficits in chronic cerebral hypo-perfusion injury.
2. To compare therapeutic versus prophylactic efficacy of dietary choline supplementation on learning & memory in chronic global cerebral hypo-perfusion brain injury model.

**Materials and Methods:** 8-10 months old Male Wistar rats subdivided into 5 groups:-1: (normal control), 2: (BCCAO), 3: (sham BCCAO), 4: (post BCCAO choline supplemented group) & 5: (prophylactically supplemented BCCAO group).

Dietary choline supplementation administered 15 days prior BCCAO in group 5 & continued 30 days thereafter. Group 4 was supplemented only after BCCAO.

**Results:** Significant memory impairment ( $P < 0.001$ ) was observed in BCCAO rats compared to controls. Choline supplementation subsequent to chronic global cerebral hypo-perfusion brain injury alleviated cognitive deficit to lesser extent compared to significant improvement ( $P < 0.001$ ) in memory-retention in prophylactic choline supplemented BCCAO rats.

**Conclusion:** Prophylactic choline supplementation confers better neuroprotection in preserving cognitive function than therapeutic supplementation in chronic cerebral hypo-perfusion brain injury.

**Corresponding address:** G. Siva kumar, Dept. of physiology, Kasturba medical college, manipal university, manipal-576104 Phone no: 9844171014 Email address : siva.kumar.g@manipal.edu

## **Prediabetes: A study of its Prevalence and its Association with the Anthropometric Variables in Adult Population of Lucknow**

PI161

**M.M. Khan\*, Abhishek Arun\*\* and Shweta Sehgal\***

Department of Physiology, Career Institute of Medical Sciences & Hospital, Lucknow, U.P., India\*, Department of Community Medicine, Era's Medical College & Hospital, Lucknow, U.P., India\*\*

**OBJECTIVE:** To find out the prevalence of 'impaired fasting glucose' or Pre-Diabetes and to correlate it with other variables like age, weight, body mass index, waist circumference and waist-hip ratio.

**METHOD:** A cross-sectional study carried out on subjects attending the OPD of M.V. Hospital and Research Centre, located in Lucknow, India. A diagnosis of impaired fasting glucose (IFG) was made as per the American Diabetes Association (ADA) guidelines.

**RESULTS:** The prevalence of IFG in the studied population was found to be 19.5%. A significantly higher prevalence was found amongst higher body weight persons, as per expectations. No significant correlation was found with body mass index, but the prevalence of impaired fasting glucose increased with increasing waist circumference and showed a significant correlation with increasing waist-hip ratio.

**CONCLUSION:** Study showed that the prevalence of IFG is very high in Lucknow. The traditional risk factors like high total body weight and body mass index are not very good predictors for the development of Diabetes Mellitus in the rural/semi-urban populations.

**Corresponding author:** Dr.M.M.Khan, Professor & Head, Department of Physiology, Career Institute of Medical Sciences & Hospital, Lucknow, U.P., India

**Address:** 290/376, Anupam Nagar, Aishbagh, Lucknow, (U.P.)-226004

**Email ID:** shwetajaipurr@yahoo.co.in

## A study of thyroid stimulating hormone (TSH) in relation to body mass index (BMI) in clinically euthyroid subjects.

Madhumita de, KaliCharan Roy, Arup Bandyopadhyay, Kamakhya Kumar, Anant Kumar

P162

Block-2, Flat-3c, Shakuntala Garden, 609, Laskarhat, Kolkata

**Introduction:** The eminent role of the pituitary hormone, Thyrotrophin (TSH) is to regulate the function of the thyroid gland. The serum level of TSH is a reliable index of the biological activity of the thyroid hormones. In turn, as prime regulators of energy balance, the contribution of thyroid hormones to the maintenance of body weight has been the subject of numerous clinical studies. Measurements of serum level of TSH has been a consistent component of the clinical studies on the relationship between thyroid function and adiposity.

**Aims & Objectives:** To study the relation between the serum TSH level and Body Mass Index (BMI).

**Materials & Methods:** The present study has been conducted in the Department of Physiology, MGM Medical college, Kishanganj, Bihar between october'2012 to june'2013, among the 50 medical and paramedical students attending classes in our department. BMI & serum TSH levels were measured. Patients with present or past or family history of any thyroid disorders were excluded from the study.

**Results:** It is seen that the mean values of BMI are higher in males ( $21.41 \pm 2.19$ ) than females ( $21.36 \pm 2.99$ ) whereas there is no significant difference in mean values of TSH. In both sex TSH found to have a strongly positive and significant correlation with BMI.

**Conclusion:** The positive association between BMI & TSH level can explain a direct action of TSH hormones on adipocytes.

**Corresponding address:** Madhumita de, Department of Physiology, MGM Medical College, Block-2, Flat-3c, Shakuntala Garden, 609, Laskarhat, Kolkata- 700039, Mobile: 09433080520, E-mail: drmadhumita.de026@gmail.com

## Effect of menstrual cycle on body composition parameters

Madhuri Gaikwad, Anil Tambe

P163

**Aim:** To study effect of different phases of menstrual cycle on body composition parameters including adiposity like body weight, total body fat, body fat percentage & basal metabolic rate (BMR).

**Objective:** Most women experience some type of discomfort during the menstrual cycle such as headaches, breast tenderness, mood swings & water retention. Since water make up 73% of lean body tissue, fluctuations in body water due to changes in a women's menstrual cycle may affect measurements of body composition. This study will evaluate any correlation present between different phases of menstrual cycle on body composition parameters.

**Methods:** 50 female students of GMC Nagpur aged 18- 25 yrs with regular menstrual cycle (26- 32 days) were selected as participants. Menstrual cycle is divided into 3 phases- Menstrual phase, Follicular phase & Luteal phase. Body weight was estimated from digital weighing machine, Body fat percentage & BMR was calculated from body fat monitor. Total body fat was calculated from sum of skinfold measurement of triceps, suprailiac & thighs using body caliper.

**Results:** Statistical analysis was done using analysis of variance (ANOVA). Data is represented as mean  $\pm$  SD ( $p < 0.05$  = statistically significant). Results showed a significant difference in weight ( $p < 0.05$ ) between menstrual &

follicular phase. Total body fat & body fat percentage was significantly increased during luteal phase. BMR during menstrual phase was significantly ( $p < 0.05$ ) lower than luteal phase.

**Conclusion:** Therefore body weight increases while BMR decreases during menstrual phase. Total body fat & body fat percentage increased during luteal phase.

**Corresponding address:** Dr.Madhuri Gaikwad, Address – 329/ 42, surbhi society, hingwala lane, Ghatkopar east Mumbai – 400075. Email – dr.madhuri86@gmail.com

## **Bioelectrical impedance: an optimal method for measuring body fat in clinical practice**

**Madhusudhan U, Revathidevi .M.L, Purushothama S.M, Manjunatha S N**

P164

**Aims & Objectives:** The present study was aimed at estimating body fat percentage using BIA principle based instrument and skin fold thickness method and also to correlate body fat percentage analysed by two methods with anthropometric parameters

**Method:** The study sample consisted of 173 subjects in the age group of 18-40 years. Height was measured using stadiometer. Body fat percentage was analysed using Lange calliper using 4 site skin fold thickness and also using BIA (Bio electric impedance analysis) principle based instrument, Equinox –EQ 33, which incorporates weighing scales and measures both weight and bio impedance

**Results:** Out of 173 subjects 60.1% were males & 39.9% were females. Mean Body fat percentage by Skin fold thickness was 24.7% and by BIA was 28.8%. This difference in mean was not statistically significant. Body fat percentage analysed by both the methods significantly ( $p < 0.05$ ) correlated with anthropometric variables (Waist circumference, BMI, W/H ratio) and there is significant correlation between estimates of Body fat percentage measured by BIA and Skin fold thickness.

**Conclusion:** Strong concordance & a significant correlation were observed between BIA & Skin fold thickness, suggesting that BIA based instrument can be used for body fat assessment in clinical practice.

**Key Words:** Skin fold thickness, Body fat percentage, BIA

**Corresponding address:**Dr. Madhusudhan U, Department of Physiology Mysore Medical college&Research Institute, Irwin Road, Mysore 57001, Email. drmadhusudhanu@gmail.com, ph no; 9902315486

## **Influence of prenatal testosterone exposure on cerebral lateralization: a prospective study among college students**

**Magith Thambi, Nivya Kolli, M.K. Unnikrishnan\*, Vishnu Unnikrishnan**

P165

Manipal College of Pharmaceutical Sciences, Manipal University, Karnataka, India – 576104

**Aim** To explore the effect of antenatal testosterone exposure on cerebral lateralization.

**Objective** To use 2D:4D as a tool to measure pre natal testosterone exposure and find its influence on cerebral lateralization.

**Methods** The students' (Age:  $19.254 \pm 0.235$  years) index and ring finger lengths of left palm were measured using a vernier caliper .2D: 4D ratios (index finger length: ring finger length) were determined. Each student was given a copy of the Edinburgh Handedness Questionnaire. The filled up questionnaires were collected back and handedness scored.

**Results** The 2D:4D ratios (Mean  $\pm$  SEM) of boys and girls were found to be  $0.967 \pm 0.0037$  and  $0.993 \pm 0.0031$  respectively. There was no significant correlation between handedness and 2D:4D ratio in both the genders. However the left-handers of both the genders were found to have a lower 2D:4D compared to the mean values of the respective groups: ( $0.926 \pm 0.022$  (males) and  $0.942 \pm 0.034$  (females)).

**Conclusion** The 2D:4D ratios obtained were consistent with other studies conducted in Indian population. Lower 2D:4D ratio in left-handers may be attributed to the ability of prenatal testosterone to retard the growth of specific in regions in the left hemisphere while facilitating the growth of homologous area on the right.

**\*Corresponding Author:** M. K. Unnikrishnan, Professor, Manipal College of Pharmaceutical Sciences, Manipal University, Karnataka, India - 576104; Tel.: +91 820 2922454; Fax: +91 820 2571998; e-mail: mkunnikrishnan@gmail.com, unnikrishnan.mk@manipal.edu

## Prevalence of metabolic syndrome among doctors of Bhubaneswar, Odisha

Magna Manjareeka, Suresh Chandra Dash, Jayanti Mishra

P166

Department of Physiology, Kalinga Institute of Medical Sciences, KIIT University, Patia – 751024

**Aim:** To find out the prevalence of Metabolic Syndrome among Doctors of Bhubaneswar, Odisha.

**Methodology:** It is a cross-sectional study including 170 (117- males and 53 – females) qualified doctors working in Kalinga Institute of Medical Sciences. Participants were selected using simple randomization technique after Institutional ethical clearance. Participants were subjected to detailed history, clinical examination, standard anthropometry measurements, and biochemical investigations on the day of presentation. Prevalence of Metabolic syndrome was estimated by National Cholesterol Education Program-Adult Treatment Panel III (NCEP-ATP III) criteria modified for Asian subjects.

**Results:** The prevalence of metabolic syndrome among the male and female doctors was 41.24% and 28.30 % respectively. This could probably be attributed to stressful working conditions, a lack of adequate physical exercise and deficiency of proper relaxation.

**Conclusion:** Metabolic syndrome is still a significant public health problem in educated population including those of doctors. Thus active preventive methods should be undertaken to reduce its prevalence.

**Corresponding address:** Department of Physiology, Kalinga Institute of Medical Sciences, KIIT University, Patia – 751024, Odisha; E-mail: dr.magna@gmail.com, m.magna77@gmail.com

## Effects Of *Sheetali Pranayama* on cardiac autonomic function

Maheshkumar.K\*, Dilara.K\*\*

P167

Sri Ramachandra university

**Introduction:** Stress poses a major trigger factor for non-communicable diseases in the today's competitive world. Beneficial effects of yoga on many physiological functions have been established in recently. Regular practice of breathing exercise has been shown to reduced blood pressure by modifying the sympathetic tone.

**Aim & Objective:** To study the effects of short term practice of cooling *pranayama* (*Sheetali pranayama*) on sympathetic function in apparently healthy normal adults.

**Materials & Methods:** This study was conducted on 20 (male) healthy volunteers in the age of 20-25years. They were randomly divided into control (10) and study group (10). Study groups were practiced *cooling pranayama*

for the period of three months. Base line blood pressure was recorded in both groups before and after three months. Cold pressure test was performed after three months.

**Result:** There was significant reduction in both systolic and diastolic blood pressure in breathing group than control group was recorded after three months ( $p < 0.005$ ). During cold pressure test, increase of systolic and diastolic blood pressure in breathing group was significantly less than control group ( $P < 0.001$ ). Similarly after recovery period systolic and diastolic pressure returned to basal levels earlier in the study group ( $p < 0.001$ ).

**Conclusion:** Breathing exercise through sustained practice of *sheetali pranayama* decreased systolic & diastolic blood pressure through cardiac autonomic modulation.

**Corresponding author:** Dr.Maheshkumar.K, Research Scholar, Sri Ramachandra university. EMail id:doctor.mahesh1985@gmail.com

### Correlation of serum sodium with glucose concentration in diabetic patients

P168

Malarvizhi.G\*, Neelambikai. N.

Department of physiology, Coimbatore Medical College, Coimbatore.

**Background:** Serum electrolyte disturbances are common in hospitalized patients, among them serum sodium changes are common in diabetic patients. Dilutional hyponatremia occurs secondary to hyperglycemia because of increased plasma osmolality. Because of increased neurological consequences associated with Hyponatremia, it is necessary to diagnose this condition earlier in patients admitted with hyperglycemic symptoms.

**Aim & objective:** To find out the correlation between serum sodium and glucose concentration in Diabetic patients.

**Materials:** A total of 50 known diabetic patients (both type I & II) in the age group of 18-50 years who were admitted in the Coimbatore medical college hospital were included in the study. They were studied from July 1<sup>st</sup> to August 31<sup>st</sup>.

**Methodology:** Study was done by history taking, clinical examination and serum sodium, glucose were measured. True serum sodium was calculated by using the formula :  $\text{true Na} = \text{measured Na} + 1.6 \left[ \frac{(\text{glucose} - 100)}{100} \right]$ . It was observed that the serum sodium concentration decreased by 1.5 mEq/l for every 100mg/dl increase in glucose concentration.

**Results:** The results were statistically analyzed by Karl Pearson's correlation. There is positive correlation ( $R^2 = 1$ ) between serum glucose and sodium was obtained.

**Discussion:** The decrease in measured serum sodium concentration along with increased glucose concentration was due to water shifts from the intracellular to extracellular compartment.

**Conclusion:** It was observed that serum sodium concentration decreases with increase in glucose concentration.

## Assessment of Endothelial Function during Pregnancy by Flow Mediated Dilatation

P169

Malhotra A<sup>1</sup>, Goel P<sup>2</sup>, Kochar S<sup>3</sup>, Archana<sup>1</sup>, Kapoor N<sup>1</sup>, Kaur G<sup>1</sup>, Bhagat A<sup>1</sup>.

1-Dept of Physiology; 2-Dept of Obstetrics/Gynecology; 3-Dept of Radiodiagnosis, Govt Medical College, Chandigarh

**Background:** Endothelial dysfunction (ED) is implicated in the pathophysiology of hypertension/preeclampsia. Flow mediated dilatation (FMD) is the goldstandard for measurement of ED. However, normal values of FMD during pregnancy have not been established in various population subgroups including North India.

**Aims:** Assessment of endothelial function during pregnancy by FMD.

**Objectives:** Establishment of normal range of FMD in pregnant females in North Indian population to be used as screening test for prediction of preeclampsia.

**Methods:** After obtaining written consent 110 primigravida were enrolled for serial FMD assessment of brachial artery after inducing reactive hyperemia with BP cuff using high resolution color Doppler ultrasound during 12<sup>th</sup>-16<sup>th</sup>, 20<sup>th</sup>-24<sup>th</sup>, 32<sup>nd</sup>-36<sup>th</sup> weeks and within 6 weeks postpartum. FMD was expressed as percent change in diameter pre and post cuff release.

**Results:** Mean±SD FMD during 1<sup>st</sup> trimester (7.2±5.2%) was comparable to reported values. FMD during 2<sup>nd</sup> trimester was similar to 1<sup>st</sup> (7.2±5.8%) but decreased significantly during 3<sup>rd</sup> trimester (5.7±3.8%, P<.003) and normalized (7.1±5.6%) after delivery.

**Conclusions:** Fall in FMD during late-third trimester can be explained by normal physiology of late pregnancy but its clinical implication is unclear.

**Corresponding address:** Dr Anita s Malhotra, Dept of Physiology, Govt Medical College, Chandigarh, Email-anitamalhotra345@hotmail.com

## Does sodium valproate improve Pentylenetetrazol (PTZ) induced kindled epileptic rat's spatial memory deficit?

P170

Mamta Kandwal<sup>1</sup>, Snehunsu Adhikari<sup>1</sup>, Satheesha Nayak<sup>3</sup>, Raghavendra Rao K<sup>1</sup>, Alex Joseph<sup>4</sup>, Pabitra Sahoo<sup>5</sup>, Sareesh NN<sup>2</sup>.

1. Department of Physiology, K.M.C., Manipal University, Manipal. 2. Department of Physiology, M.M.M.C., Manipal University, Manipal. 3. Department of Anatomy, MMMC, Manipal University, Manipal. 4. Department of Pharmaceutical Chemistry, M.C.O.P.S., Manipal University, Manipal. 5. Indian Statistical Institute, Chennai.

**Introduction:** Epilepsy is a chronic neurological disorder characterized by seizures. Significant numbers of epileptics are presented with cognitive problems & abnormal behavioural manifestations. PTZ induced kindled rat models are used to develop generalized chronic seizures.

**Aims and Objectives:** To determine spatial learning & acetylcholinesterase (AChE) levels in hippocampus and frontal cortex in normal control, PTZ-induced epileptic as well as sodium valproate treated rats.

**Methodology:** Adult male Wistar rats (n=40) were divided into four groups i.e., Group I: Cage control, Group II: Vehicle control (1% CMC), Group III: Positive control (1% CMC), Group IV: Standard drug treated (sodium valproate 200mg/kg body weight). PTZ was administered (35mg/kg) intraperitoneally every 48 hours for 30 days to induce chronic epilepsy in all groups, except in Group I & II. At the end of one month, spatial memory was tested using Morris water-maze. Then hippocampus and frontal cortex were dissected out to estimate AChE level.



**Results and Conclusion:** All the group of animals improved water-maze performance by progressively decreasing their escape latency over periodic trials, except Group III. AChE levels also significantly increased in that group compared to others, indicating the probable role of sodium valproate improving spatial memory in PTZ induced kindled epileptic rats.

**Corresponding address:** Snehunsu Adhikari, Department of physiology, Kasturba medical college, manipal university, Manipal-576104, Phone no: 09844455894, Email ID: snehunsu\_mahe@yahoo.co.in

## A comparative study of QT interval in hypertensive and normotensive subjects

P171

**Mangala Gowri S R**

Assistant Professor, Flat No: 3F, type II quarters, MGMCRI Campus, Piliyarkuppam, Pondicherry.

**Background:** Hypertension is the most common disease and it markedly increases both mortality and morbidity. Variation in QT intervals has been proposed markers of vulnerability to ventricular arrhythmias and potential predictors of mortality. This study was taken up to assess early detection of changes in QT interval among hypertensive subjects and early management of cardiac abnormalities.

**Objective:** To assess the cardiac function status in patients with essential hypertension by analyzing QTc and QT dispersion.

**Methods:** 50 hypertensive and 50 normotensive male subjects between the age group of 40 -60 years were selected. Computerized ECG system with Nivi qure software was used for the study. Measures of heart rate variability such as mean RR intervals, Mean Heart Rate, mean QT intervals, corrected QT intervals and their dispersions, were assessed to observe cardiac function status. Statistical analysis was done by using Student's unpaired t-test.

**Results:** Mean heart rate was higher in subjects with high blood pressure (0.001). QT, corrected QT intervals and their dispersion were significantly higher in the hypertensive group ( $p < 0.001$ ). Mean RR interval was significantly reduced in hypertensive subjects.

**Conclusion:** The levels of both systolic and diastolic blood pressures are related to the generation of ventricular rhythm problems either via increasing left ventricular mass which results in an increase in QT parameter measurements.

**Corresponding address:** Mangala Gowri S R, Assistant Professor, Flat No: 3F, type II quarters, MGMCRI Campus, Piliyarkuppam, Pondicherry - 607402, Email address: dr.gowrishamnur@gmail.com

## Removal of carotid bodies-key to the silent killer

P172

**Mangani Mangalavalli, S, S Chandra MD, Senthil Velou**

Department of Physiology, Sri Manakula Vinayagar Medical College and Hospital Madagadipet, Kalitheerthalkuppam, Pondicherry - 605 107. Email - drmangani@yahoo.co.in; Cell no. 9788975553.

Arterial chemoreceptors, besides aiding an important role in control of respiration, they also exercise influence on cardiovascular system. When they are stimulated, they increase the sympathetic vasoconstrictor outflow to muscle, splanchnic and renal beds, to elevate arterial pressure.

According to recent evidence, carotid body is conceptualized as a "sympathetic thermostat" of the human body, which sends afferent signal to the medulla oblongata that mediate sympathoactivation, leading to decreased

perfusion to kidneys, activating renin angiotensin system, resulting in fluid retention, increased vascular tone and increased minute ventilation via increased respiratory drive. In chronic hypertension, sympathetic thermostat, is “reset” at baseline. This new equilibrium is maladaptive leading to chronic volume overload, vasoconstriction, dyspnoea and exercise intolerance.

The carotid body chemoreceptor’s neural discharge to hypoxemia is exaggerated in humans with established and borderline essential hypertension and in genetic spontaneously hypertensive rats. This is also seen in patients with sleep apnea, who shows an elevated level of resting muscle sympathetic nerve activity that persists throughout the day, even when apnea is absent, which predisposes them to high risk for developing sustained arterial hypertension.

Regardless of the initial stimulus, the resultant chronic activation of sympathetic outflow is likely to amplify and perpetuate carotid body disturbance in a feed forward manner by vasoconstriction with decrease blood flow to the carotid bodies in hypertension.

Studies have shown that denervation of carotid bodies, decreased blood pressure in chronic hypertensives not responding to anti-hypertensives. Future in road in this area will rely on further identification of chemical stimuli, signaling pathway, altered gene expression, transcription factors responsible for this cascade of events on neural and vascular function within the carotid body.

## Effect of sports on state & trait anxiety, blood pressure & HRV

P173

**Manish Parihar, Amitabh Dube, Munish Agnihotri, RajeevYadav**

Department of Physiology SNMC(RUHS) Jodhpur, Department of Physiology SMSMC Jaipur, PhD Lecturer Department of Physical Education(RU) Jaipur, Department of PSM SMSMC Jaipur .

**Aims and Objectives:** To study effect of sports on state & trait anxiety, blood pressure & HRV with training load and fatigue estimation.

**Methods:** Written informed consent was taken from Age matched University students

of age group 16-25 year( those answered NO to all physical activity readiness questions) for recording of Spielberger’s state and trait anxiety inventory questionnaires reply, Blood Pressure by sphygmomanometer, Heart Rate Variability observations.(KK Deepak etal.AIIMS) gave the procedure ,in which subjects preparation was done as per protocol. Comparison was made between Non exercise control group (n=31),exercise group (n=31)and again in same exercise group(n=14) pre (composed of 8-10 hr rest) and post (composed of 1 hr rest) which had an intervention of atleast 60 minutes of various sports of moderate to vigorous intensity ; by applying student t test for equality of means at significance(2-tailed)at p value<0.05. Uusitalo etal.gave method that Heart rate decreases and heart rate variability increases with the positive training effect. In sympathetic overtraining state the heart rate increases and heart rate variability decreases. In the parasympathetic overtraining state both heart rate and heart rate variability decreases.

**Results& Conclusions** - One hour of sport is intervention, therapeutic, prevention ; as it decreases resting State and Trait Anxiety,significantly decreases resting Systolic,Diastolic and Mean Arterial Blood Pressure,HRV also reflected Physiological basis of anxiety and blood pressure & training load and cumulative fatigue estimation.

## Evaluation of hand circumference as a predictor of maximum grip strength (MGS)

P174

Manjunath H<sup>1</sup>, Venkatesh D<sup>2</sup>, Swetha Rajkumar<sup>1</sup>

<sup>1</sup> Navodaya Medical College Raichur Karnataka India; <sup>2</sup>Professor & Head of Physiology, M S Ramaiah Medical College, Bangalore, Karnataka, India.;

**Aims and Objectives:** The objective of this study was to establish the correlations between anthropometric data like Body Mass Index (BMI), forearm circumference and hand circumference and maximal grip strength (MGS) in order to establish a simple model to predict normal MGS.

**Methods:** 40 males and 40 females in the age group 17-19 were recruited for the study. MGS was measured with a computerized Hand Dynamometer (AD Instrument, Australia). BMI, forearm circumference and hand circumference were measured. The circumference was measured by flexible measuring tape. Pearson's correlation coefficient test was applied to see the correlation.

**Results:** There was a positive correlation between all anthropometric data and MGS in both males and females. The hand circumference had the strongest correlation with MGS in both males and females for right hand. However, the correlation was observed only in females for the left hand.

**Conclusion:** Hand circumference is a better predictor of normal MGS than BMI and forearm circumference.

**Corresponding address:** Dr. Manjunath H, Assistant Professor of Physiology, Navodaya Medical College, Raichur - 584101 Karnataka; E-mail: aaryanmunch@gmail.com

## Perception of Case based learning in Physiology: An evaluation

P175

Maria Pauline<sup>1</sup>, Sandhya T Avadhany<sup>2</sup>

Department of Physiology, St John's Medical College, Bangalore

**Background:** Lecture format is widely used in India as an educational methodology to convey knowledge. A well prepared lecture is an instructor-led that engages students in the process of learning. It is a useful tool to communicate basic facts, introduce initial concepts and convey passion about a topic. Case-based learning (CBL) is a long established pedagogical method that fosters active learning through the use of authentic clinical practice scenarios. It links theory to practice, through the process of application of knowledge to the cases.

**Aims:** It is well known that the preclinical subjects taught to the 1<sup>st</sup> year medical students when integrated with clinical scenarios enhanced learning and critical thinking. The study intended to develop interactive learning in physiology for better comprehension, clinical correlation and motivate students to become a self directed learner.

**Objectives:** To analyze the perceptions and experience of 1<sup>st</sup> MBBS students and faculty related to the effectiveness of CBL and lecture as a means of learning physiology.

**Methods:** Topic chosen was 'Physiology of pancreatic hormones and its pathophysiology'. Case scenario was prepared to be conducted on two consecutive weekends with questions pertaining to physiology, pathophysiology, clinical features, and investigations and briefly on treatment. Evaluation tools included MCQ's with questions on recall and critical thinking for pre and post test. Questionnaires were used (Likert scale) to capture the perception of students and facilitators. Focus group discussion was used for an in-depth understanding of students' perception. All documents were peer reviewed and validated for content and construct. Faculties were trained with mock sessions. Students were randomly assigned to 6 groups of 10 students each, of the 60, 58 consented and 56 completed the study.

**Results:** Pre and post CBL scores were compared using paired t test. Number and percentages were reported for each item in the questionnaires. Total score was computed by adding the scores in each category. Post test scores were significantly higher than pretest. Facilitators think that students were consistently well prepared for the sessions, accepted responsibility, actively participated in group discussions, had effective group skills, were able to communicate with peers, exhibited professional behavior, possessed self awareness and had an aptitude for critical thinking that was exceptional to adequate in 87% to 96%.

Students (94 to 95%) think that clinical case as a learning tool motivated them to a learning experience that simulated real life experience and made learning interesting and fruitful, more so when all team members came prepared for the sessions. Working in groups improved understanding of the topic and to develop a concept in 80.4% students. 74 to 91% of students opined that congenial environment was beneficial for learning. Students, 91 to 94% of them expressed that the facilitator created a supportive group climate, facilitated the participation of all group members, kept the group focused on the task and did not dominate group discussion,. There was no difference between males and females in all the analyses.

**Conclusions:** CBL improved the scores of students in MCQ's testing recall and critical thinking compared to the pretest done after lecture and before CBL. Majority of students who were introduced to CBL think that learning was interesting, motivating, induced critical thinking and learning through discussions in small groups. Facilitators have agreed that most students came prepared, participated in discussions and enjoyed the process. In the focus group discussion (FGD), student's views have been, "...real life situations were addressed....was interesting", encourages individual thinking and creativity....." Using of case scenarios simulated real life situation of diabetes and this made learning active, interesting, enhanced critical thinking and enjoyed interaction in small groups. The CBL was beneficial to develop concept in physiological mechanisms and pathophysiology related to pancreatic hormones. This approach to teaching and learning may be important in pre and paraclinical subjects in Indian medical students.

## **Association between Body Mass Index & Blood Pressure in medical students–A cross sectional study.**

**Massrat Firdos, Qazi Shakeel Ahmed**

P176

**Aims & Objectives:** This study was conducted to assess association between body mass index & blood pressure in medical students.

**Material and Method:** A cross sectional type of study was carried out among 400 medical students between the age group of 18-20 years .Height and weight was recorded & Body Mass Index (BMI) was calculated. Blood pressure was recorded as recommended by the fourth report.

**Result & discussion:** The statistical analysis was done using pearson correlation test. There was significant positive correlation among BMI, systolic & diastolic blood pressure. We concluded that the recognition of obesity, as assessed by BMI in the present study is important factors associated with increased risk of developing elevated BP in medical students.

**Corresponding address:** Massrat Firdos, H.NO. 6-2-101. Mohella Sayyadan Nanded. 431604. E.mail: massratfirdose@yahoo.in / firdosmassrat@gmail.com

## A comparison of nerve conduction studies in impaired glucose tolerance and non diabetic

Mayanglambam Sangeeta Devi, Shankarappa C

Dept. of Physiology, VIMS & RC, Bengaluru.

P177

**Introduction:** Prevalence of diabetes and prediabetes is increasing worldwide and experts have projected that more than 366 million people will have diabetes and 470 million people will have prediabetes by 2030. A study done in 2011 projected that India would be 62.4 million people with diabetes and 77.2 million people with prediabetes. Long standing hyperglycemia is responsible for increased activation of the polyol pathway and increased production of advanced glycation end products which promotes oxidative stress results in impaired blood flow to the nerves, leading to hypoxia and reduced production of nerve growth factor perpetuates neuronal damage. The neuropathy associated with impaired glucose tolerance is clinically similar to early diabetic neuropathy

**Objective:** To compare the nerve conduction studies in patients with prediabetics with HbA1C levels.

**Materials and methods:** This is a comparative & cross sectional study. In this study, we included 30 pre-diabetic cases & 30 normal controls. We have compared the nerve conduction velocity & amplitude of the lower limbs with the glycosylated Hemoglobin levels in prediabetics & controls.

**Results:** By using Pearson's correlation coefficient the nerve conduction velocity and amplitude show negative correlation of 0.80 with increase in glycosylated Haemoglobin level

**Conclusion:** The abnormality expressed by nerve conduction studies was related to glycosylated haemoglobin. Based on the results of this study, it might be predicted that better control would decrease the early neuropathy.

## Heart rate variability as a tool for early diagnosis of autonomic neuropathy in non diabetic off springs of diabetic parents

Mehak Mufti, Ravikiran Kisan, D.V .Deshpandhe

Department of Physiology, SSIMS & RC, Jnanashankara, NH 4, bypass road, P.B no 1, Davangere, Karnataka, 577005

P178

**Objective:** To evaluate the influence of parental diabetes on the heart rate variability of their non diabetic off springs.

**Method:** The study was conducted in the department of Physiology SSIMS and RC after the approval of the institutional ethical committee. Thirty cases in the age group of 18 -25 years, who were non diabetic off springs of diabetic parents and age and gender matched thirty subjects with no family history of diabetes mellitus were recruited as controls for the study on the basis of predetermined inclusion exclusion criteria. Resting 15 minutes lead II ECG and heart rate was recorded by ADInstruments - Power lab 26T, Australia. Offline assessment of time and frequency domain parameters of heart rate variability (HRV) was done with Lab Chart 7 software.

**Result:** Frequency domain analysis of HRV shows increased low frequency (p value 0.01) and a decreased high frequency (p value 0.02) in the cases as compared to that in the control group and the difference is statistically significant. Time domain analysis shows decrease in SDNN (standard deviation of normal R-R interval)

**Conclusion:** Our results suggest that the autonomic functions of subjects whose parents are diabetic are affected and show a sympathetic over activity.

**Corresponding address:** Dr. Mehak Mufti, Department of Physiology, SSIMS & RC, Jnanashankara, NH 4, bypass road, P.B no 1, Davangere, Karnataka, 577005, **E-mail id:** dr.mehaknazim@rocketmail.com **Phone Number:** 9620467763

## Psychomotor functions at various weeks of Chronic Renal Failure in rats

PI179

Merin Iype. C<sup>1</sup>, Subramanya Upadhya<sup>2</sup>, Sharmila Upadhya<sup>3</sup>, Gopalakrishna Bhat<sup>4</sup>

<sup>1</sup>Department of Physiology, MSU-GEF International Medical School, Bangalore.

<sup>2</sup>Department of Pathophysiology, School of Medicine, St.George University, West Indies.<sup>3</sup>Department of Biochemistry, School of Medicine, St.George University, West Indies.<sup>4</sup>Department of Biochemistry, Kasturba Medical College, Manipal.

**Background:** In Chronic Renal Failure there is a gradual retention of substances in the tissues and body fluids, called as uremic retention toxins, which can bring about a number of biochemical activities in the body. Chronic renal insufficiency also leads to progressive behavioural conflict. Uremic toxins can affect both the central and the peripheral nervous system. Uremic encephalopathy is also associated with problems in cognition and memory.

**Objectives:** To study the psychomotor functional disorders in rats with progressive chronic renal failure

**Methods:** Surgical nephrectomy was done by resection method. The animals were grouped into 2 control groups, Sham control (SC) and Normal control (NC) and two uremic groups, Moderate uremia (G<sub>M</sub>) and severe uremia (G<sub>S</sub>). Psychomotor analysis was done by passive avoidance and open field in these animals at 4, 8, 12, and 16 weeks.

**Results:** After the incubation period, the nephrectomised groups (G<sub>M</sub> and G<sub>S</sub>) showed significant changes in exploratory, locomotor and emotional behaviour when compared to the controls (NC and SC).

**Conclusions:** Psychomotor changes involve poor cognition, reduced memory, reduced locomotor activity and decreased exploratory drive and emotional disturbance like increased fear during the initial stages. During the later stages a restless behaviour is noticed, associated with diminished fear.

**Corresponding address:** Dr.Merini Iype.CDept of Physiology,MSU-GEF International Medical School,New BEL Road, MSRIT Post,MSR Nagar,Bangalore-560054, Email: meriniyep@gmail.com

## A study of thyroid profile among infertile females

PI180

Merrycka A. Sangma<sup>1</sup>, Florence Lalvarmawi, Ksh Gomti Devi, W.Imo Singh<sup>2</sup>

1) Department of Physiology, RIMS, Imphal-795004. 2) Manipur Health Services. Email id: merryckasangma@yahoo.com

**Objective:** To assess the thyroid profile among infertile females.

**Materials and method:** The study was carried out in the department of Physiology, Regional Institutes of Medical Sciences (RIMS) in collaboration with Suba Hospital and Assisted Reproductive Centre, Kombirei keithel, RIMS South Gate. The study include 50 females between the age group of 20-45years, diagnosed as infertility and compare with 20 age matched fertile females.2ml of venous blood sample was collected in plain vials. The sera samples are then used to estimate serum tri-iodothyronine (T3), thyroxine(T4) and Thyroid stimulating hormone(TSH) by Enzyme Linked Immunosorbent Assay(ELISA).

**Results:** The median value of serum T3 in the control group was 1.13µg/dl while it was 5.65µg/dl in hyperthyroid (p=0.000 i.e highly significant),-0.5µg/dl in hypothyroid (p=0.000 i.e highly significant). Serum T4 in the control group was 7.30µg/dl while it was 22.81µg/dl in hyperthyroid (p=0.000 i.e highly significant),2.61µg/dl in hypothyroid (p=0.000 i.e highly significant). Serum TSH in the control group was 1.00mIU/L while it was 0.68mIU/L (p=0.007 i.e not significant) in hyperthyroid,8.60mIU/L in hypothyroid(p=0.000 i.e highly significant). Out of 50 patients of the study group, thyroid dysfunction was associated with 22(44%) infertile women,17 (34%) women had hypothyroidism,5(10%) women had hyperthyroidism and 28 women (56%) were with euthyroid state while in the control group all the 20 women had euthyroid profile.

**Conclusion:** Thyroid dysfunction seems to be common among the infertile females in our study. Thyroid profile should be kept in consideration during infertility workup in women.

## The impact of early clinical exposure on first M.B.B.S. students in india

P181

<sup>1</sup>Motilal C. Tayade, <sup>2</sup>Nandkumar B. Kulkarni, <sup>3</sup>K.N.Dandekar, <sup>4</sup>Noorin Bhimani

<sup>1,2</sup> Department of Physiology, Rural Medical College, Pravara Institute of Medical Sciences; <sup>3</sup> Department of Surgery, Rural Medical College, Pravara Institute of Medical Sciences, A.P.Loni, Tal.Rahata, Dist. Ahmednager, State- Maharashtra, Pin - 413736; <sup>4</sup> Department of Physiology, L.T.M. Medical College & L.T.M.G. Hospital, Sion, Mumbai - 400 022.

**Introduction:** Physiology is one of the basic sciences in medical curriculum. In most of the institutes, teaching of clinical examination to the undergraduate students is done mostly in physiology laboratory on normal healthy individuals. The present study was planned to study the impact of early clinical exposure on students' knowledge, skills and attitude and to study the perception of students and faculty towards ECE.

**Methodology:** Participants in the study were 60 voluntaries studying in first year M.B.B.S. for academic year 2012 – 2013, who consented to undergo study carried out at Pravara Institute of Medical Sciences, Loni. Initially orientation program on ECE was conducted for all the students. They were randomly divided into two groups. Group A was trained by using early clinical exposure method for one hour session directly in Surgery OPD. Group B was trained by using traditional method (Chalk& Board) for one hour in department of physiology with same topic. Knowledge was tested by MCQ sheet, Skills were tested by OSPE and attitude was tested by perception based questionnaire using Likert scale.

**Observations & Results:** The two group results were tabulated and 't' value was calculated. As the calculated value of t test is greater than table value, we reject the null hypothesis. Hence significant difference was found in the knowledge, skills and attitude of students of two groups.

**Conclusion:** From present study we may conclude that ECE improves the knowledge and skills in the medical students as evident by difference in score of two groups. ECE increases student interest in learning and increased recall capacity.

**Keywords:** Early clinical exposure, traditional teaching

## Evaluation of antioxidant potential and reno-protective effect of *Amorphophallus campanulatus* against ethanolic stress

P182

Moumita Das, Subhashree Basu and Gouriprosad Datta

Department of Physiology, Rammohan College, 85A, Raja Rammohan Sarani, Kolkata: 700 009

**Aim:** This study was aimed to evaluate the protective role of ethanolic extract of *Amorphophallus campanulatus* (*EtAc*) against ethanol induced nephrotoxicity in male wistar rats.

**Objectives:** Assessment of *in vitro* antioxidant potential of *EtAc* and *in vivo* protective action against ethanol induced oxidative stress by biochemical observations, supplemented with histo-pathological study of kidney sections.

**Methods:** Initially, antioxidant potential was evaluated by analysing the phytoconstituents and DPPH radical scavenging activity. For *in vivo* study, rats were grouped (n=6) in the following manner: ethanol (1gm/kg bw, i.p.) treated, *EtAc* (250 mg / kg, i.p.) treated, ethanol pre-treated with *EtAc* and the control group (0.5 ml normal saline i.p.) for 4 weeks. The extent of tissue damage was assessed from serum urea and creatinine levels, bio-markers of tissue oxidative stress (GSH and TBARS) and histo-morphological alterations through H-E staining.

**Results:** *EtAc* showed presence of polyphenols and flavonoids, along with significant DPPH radical scavenging activity. Ethanol significantly ( $p < 0.001$ ) elevated the levels of serum urea, creatinine, tissue TBARS concentration and reduced tissue GSH content, compared to control. Pre-treatment with *EtAc* significantly ( $p < 0.01$ ) reversed the above changes and simultaneously prevented cellular damage, as seen in histological sections.

**Conclusion:** Hence, the present study concludes that *EtAc* can protect renal tissue against ethanolic stress, probably owing to its free radical scavenging property.

**Corresponding address:** Moumita Das, Department of Physiology, Rammohan College, 85A, Raja Rammohan Sarani, Kolkata: 700 009, Email: accessmdas@gmail.com

### Effect of blood glucose level on simple reaction time in healthy female volunteers

P183

**Mrunalini Wadhai, Mohankumar Tambe**

Department of Physiology, GMCH, Nagpur.

**Aims & Objective:** Glucose is major source of energy for the brain. It follows that any fluctuations in availability of blood-borne metabolic substrate may modulate brain metabolism & thereby cognitive functions. Hence study was carried out to determine effect of blood glucose level on simple reaction time in healthy young females.

**Methods:** 50 healthy female volunteers (age- 17-21 yrs) were recruited for study. Blood glucose level, Auditory & Visual reaction time was recorded early morning, fasted overnight (minimum 8 hrs). 75 gm of glucose is given with water to drink within 15 min after this procedure. Blood glucose level, Auditory & Visual reaction time was recorded 60 min after taking glucose.

**Results:** Results were expressed as mean  $\pm$  standard deviation. Data was analysed using Paired Student t-test. Both Auditory & Visual reaction time shows significant improvement with higher glucose level within normal range ( $p$ -value $<0.05$ )

**Conclusion:** The results indicate that higher blood glucose level had beneficial effect on both Auditory & Visual reaction time.

**Corresponding address:** Dr. Mrunalini B. Wadhai, plot no.67, Ghatate nagar, Pardi, Nagpur. Email-dr.muru88@gmail.com.

### Correlation between fitness index and B.M.I. among 1<sup>st</sup> M.B.B.S. students of tribal district teaching hospital

P184

**Mudassir Mirza and P.Sreemala**

**Aim:** Present study was conducted to investigate association between BMI and physical fitness among 1<sup>st</sup> M.B.B.S. students of a tribal district teaching hospital.

**Method:** A total of 100 students including 39 males and 61 females of age group between 17-19 years were assessed for their cardiorespiratory fitness, measured using maximal oxygen uptake ( $VO_{2max}$ ) by the Queen's College Step Test. The subjects were instructed to perform test for a total duration of three minutes at the rate of 24 cycles per min. After completion radial pulse rate was recorded from the 6th to 20th sec of the recovery period in same position. 15 sec pulse rate was converted into heart rate/min & the  $VO_{2max}$  was calculated from Wassermann's equation.



**Result:** Observed mean BMI (kg/m<sup>2</sup>) was  $22.9 \pm 1.38$  and  $24.7 \pm 1.8$ ; and mean VO<sub>2</sub> max (ml/kg/min)  $49.17 \pm 7.20$  and  $34.19 \pm 5.76$  for male and female, respectively. Correlation coefficients between both BMI and VO<sub>2</sub> max were statistically significant in male ( $r = -0.603$ ) and female ( $r = -0.82$ ).

**Conclusion:** This study illustrated a negative moderate relationship between body mass index and physical fitness among the students of this tribal district teaching hospital.

**Corresponding address:** Dr. Mudassir Mirza, Assistant Professor, Department of Physiology, R.I.M.S., Adilabad-504001-A.P. E-mail id: -mirza141@gmail.com

## **A study of the different cases of psychogenic nonepileptic Seizure(PNES) and the various factors leading to it.**

P185

**Munmi Gogoi, Nc Borah, Biju Choudhury, Shrabani Barman, Vivekananda Lahon, Bedanta, lovely.Japorigog, Guwahati**

**Background:** Pseudoseizures or psychogenic non epileptic seizures(PNES) or non epileptic attack disorder(NEAD) are "mimic seizure" that superficially bear a resemblance to epileptic seizures but are without any organic cause. They are basically psychogenic in origin and can pose a significant diagnostic and therapeutic challenge.

**Aims & Objectives:** Study was conducted with the aim to determine the prevalence of PNES cases amongst the different cases presenting as seizure attack and evaluating the major causes leading to it.

**Methods:** Study was carried out in a tertiary level hospital: the Guwahati Neurological and Research Centre. Study covered patients with different ages who presented clinically as seizure cases in the epilepsy monitoring unit of the hospital. Age range of the subjects in the study was between 18-40 yrs. Patients with history of TIA, syncope, migraine, head injury, metabolic disturbances like hypoglycemia, hyponatremia, cardiac arrhythmias were excluded from the study. Also patients diagnosed to have epileptic seizure in the past were excluded. Simultaneous video and EEG monitoring of the patients were done with the aim of capturing 1-2 seizure episodes on both video and EEG. Cases who failed to display abnormal EEG activity suggestive of epilepsy before, during or after a clinical seizure episode and whose physical and other neurological examination were normal were designated to have PNES and were included for the study. THEN the anxiety and depression scores of these patients were evaluated through Hamilton Rating Scale for depression and HAM-A,D.

**Results:** The study showed the prevalence of PNES cases among the epileptic cases to be 3 to 4% most cases were in the age group of 20-33 yrs with female preponderance. Anxiety and depression ranging in severity from moderate to severe was found to be the major causes (96%). The causes for the anxious and the depressive states were varied with stress of academic pressure (learning disabilities) and stress of a strained relationship contributing significantly. Stress due to adverse family dynamics (quarrel among parents, chronic abuse history) also contributing minimally to this seizure disorder.

**Conclusions:** Thus PNES can be said to be a medical manifestation of psychological problems that can cripple the lives of those who suffer from it. So its diagnosis is the first and the most important step in the journey towards regaining control of life of these patients. Accurate diagnosis through video EEG is vital in ensuring appropriate and successful treatment. Also an important step in treating this condition is that the patient should be aware of and have a positive understanding of the stressors lying behind the seizures. A combination of counselling and anti-anxiety medication can be very helpful in addressing the cause of the problem and many patients can be alleviated of seizure symptoms and can live a seizure free life.

**Corresponding author:** Munmi gogoi, Email id: mungo14@gmail.com

## Effect of Environmental Tobacco Smoke Exposure on Pulmonary Function Tests in Women from Rural Population

P186

Mythili Bai K<sup>1</sup>, M.S Kumari Sheela<sup>2</sup>, Rema V Nair<sup>3</sup>, Madhavrao C<sup>4</sup>, Devi S<sup>5</sup>, Aswathy L<sup>6</sup>

<sup>1,5,6</sup>Postgraduate in Physiology, <sup>2</sup>Professor and HOD of Physiology, <sup>3</sup>Associate Professor of OBG, <sup>4</sup>Assistant Professor of Pharmacology Sree Mookambika Institute of Medical Sciences [SMIMS], Kulasekharam [K.K District] Tamilnadu

**Introduction:** Environmental tobacco smoke [ETS] exposure in present world has gained much public importance due to its many associated health hazards in humans. Theoretically it is possible that ETS exposure has the same risk as seen in active smoking and more prevalent in South -East Asian children and women. There are only few studies published in literature which showed mixed [subtle as well as overt] effects of ETS exposure on PFTs.

**Aims and objectives:** To study the effect of ETS exposure on PFTs in women from rural population

**Materials and methods:** The study included total 100 women who were divided into Group I [n=50, Women who were not exposed to ETS] and Group II [n=50, Women who were exposed to ETS]. The study included 13 PFT parameters & was done by using computerized Spiro Excel system. The P<0.05 was considered statistically significant.

**Results:** There was significant decrease [P<0.001] in FVC, FEV<sub>1</sub>, FEV<sub>1</sub>/FVC, PEFR, PIFR, FEF<sub>25-75%</sub>, FEF<sub>25%</sub>, FEF<sub>50%</sub> and FEF<sub>75%</sub> in Group II compared to Group I. Study also showed non-significant slight decrease in ERV, TV and MVV and slight increase in IRV in Group II compared to Group I [P>0.05].

**Conclusion:** ETS exposure significantly decreases FVC, FEV<sub>1</sub>, FEV<sub>1</sub>/FVC, PEFR, PIFR, FEF<sub>25-75%</sub>, FEF<sub>25%</sub>, FEF<sub>50%</sub> and FEF<sub>75%</sub> in women from rural population.

**Corresponding author:** Mythili Bai K, Postgraduate [3<sup>rd</sup> Year], Department of Physiology

Sree Mookambika Institute of Medical Sciences [SMIMS], V.P.M. Hospital Complex, Kulasekharam [K.K District], Tamilnadu -629161, Mobile: +91-9585057419, Email: drmythili4u@gmail.com

## Effect of yoga practice on cardio respiratory fitness and physical fitness index in young adult males

P187

Nagalakshmi Vijaykumar, Shobha C Nallulwar

Department of physiology, Sri Dharmastala Manjunatheswara College of medical sciences and hospital, Dharwad, Karnataka, India.

**Background:** The prevalence of cardiovascular disease has increased over the past few decades. It has established that low cardio respiratory fitness is one of the attributing factors for increased cardiovascular mortality. Yoga practiced in India over thousands of years shown to improve various physiological variables and thereby increases fitness of an individual.

**Aim and objective:** This study was done to know the effect of yoga on cardio respiratory fitness and physical fitness index (PFI) in young adult males.

**Methods:** The present study consisted of 50 healthy male subjects in 20-40 years age group. The participants fulfilling the inclusion and exclusion criteria practiced one hour yoga everyday for 6 weeks. Pre yoga and post yoga cardio respiratory fitness was assessed by measuring Vo2 max and PFI. Statistical analysis was done by paired t test.

**Results:** There was significant reduction in resting pulse rate ( $p < 0.001$ ), and a significant increase in  $Vo_2$  max ( $p < 0.001$ ) and PFI ( $p < 0.001$ ) after ix weeks of yoga training when compared to pre yoga practice.

**Interpretation and Conclusion:** This study showed beneficial effects of yoga on cardio respiratory fitness and PFI in young adult males.

**Key Words:** cardio respiratory fitness, yoga,  $Vo_2$  max.

**Corresponding address:** Dr. Nagalakshmi V, Assistant Professor, Dept of physiology, SDM College of medical sciences and hospital, Sattur, Dharwad, Karnataka – 580009 Phone no: 9686848146, 9019263419 E-mail: drlakshmi26@yahoo.com

## Does waist circumference affect PEFR in adolescent?

P188

**Nandini Priya**

Coimbatore Medical College, Coimbatore. Email: m\_nandini\_priya@yahoo.co.in

**Background:** The prevalence of obesity in adolescent population is 10-20%. The commonly used measurement body mass index (BMI) does not distinguish between weight associated with muscle and weight associated with fat. Changes in waist circumference reflect changes in risk factors for cardiovascular, respiratory and other chronic diseases.

**Objective:** To determine the relationship between pulmonary function by peak expiratory flow rate (PEFR) and waist circumference in healthy adolescence and analyze if waist circumference is a convenient substitute for BMI

**Methods:** A cross-sectional study was conducted at high schools. Hundred children (50 females and 50 males) between 12 and 15 years were enrolled in the study. After taking detailed history they underwent a complete clinical evaluation. Their weight (in kgs), height in (cms), hip circumference (in cms) waist circumference (in cms) were recorded. The children lung function was assessed by Wright's peak flow meter.

**Results:** The data were analyzed using unpaired  $t$ -test and the 'p' value obtained is statistically significant.

**Conclusion:** The study showed that there was a reciprocal relationship between the waist circumference and peak expiratory flow rate and also between BMI and PEFR. Waist circumference is a convenient index for assessing obesity.

## Comparative study of electrocardiographic changes in athletes and non-athletes

P189

**Nandita Dutta**

**Aim:** To improve performance and endurance athlete mostly do isotonic exercise that affect cardiovascular responses and remodeling with associated E.C.G. changes. This needs to be distinguished from hypertrophied cardiomyopathy which is the leading cause of sudden death among young athletes.

**Objective:** To study and compare the E.C.G. pattern of healthy male athletes and non-athletes of same age group.

**Methods:** 100 athletes in the age group of 15-25 years and 100 age matched non-athletes were included in the study. 12-lead resting ECG was performed. Student 't' test was used to compare the mean values among the two groups.

**Results:** 1) Significant difference was noted between athletes and non-athletes in the following parameters respectively: heart rate ( $66.55 \pm 11.40$ /sec) Vs ( $80.64 \pm 12.35$ ), PR-interval ( $0.1502 \pm 0.027$ sec) Vs

(0.1356±0.019sec),QRS amplitude (33.87±5.68mm) Vs (26.98±4.85mm) 2) 27% athletes has bradycardia whereas in non-athletes there was no bradycardia. 3) Early repolarization was noted in 24% athletes as compared to 12% non-athletes

**Conclusion:** The study led to the conclusion that in trained athletes ECG findings are consistent with remodeling of the cardiovascular system. This physiological remodeling is important and helps one to distinguish pathological conditions which are quite fatal.

**Corresponding address:** Dr. Nandita Dutta, H.No.30 Kalyani nagar, Kahilipara, Guwahati 781019, Assam Email address: ndnanditadutta@gmail.com

## **Cognitive functions in Vitamin B<sub>12</sub> deficiency – the role of homocysteine and the effect of replacement therapy**

P190

**Nasreen Akhtar, Rashmi Babbar, Vinod Puri**

**Introduction:** Vitamin B<sub>12</sub> deficiency has been suggested as a cause of reversible dementia. However, there has been little consensus on a cause-effect relationship between B<sub>12</sub> deficiency and cognitive decrements. Cognitive deficit may in actuality be a specific result of elevations in homocysteine. In this study, the relationship between vitamin B<sub>12</sub>, homocysteine and cognitive functions and the effect of treatment has been assessed.

**Methods:** Cognitive functions were tested using Mini Mental State exam and Event Related Potentials (P300). 50 patients with neurological or neuropsychiatric manifestations between 18 and 50 years of age with Vitamin B<sub>12</sub> level <300 pg/ml were recruited in the study after written informed consent. Treatment regimen was hydroxycobalamin 1000 µg im daily for 7 days followed by weekly for one month and then monthly administration. Recordings of all parameters were taken at the beginning of the study, 3, 6, 12 and 18 months duration.

**Results:** Decreased MMSE, suggestive of cognitive impairment, was noted in 18 (36%) patients. P300 latency was increased in 23 (46%) patients. There was a significant correlation of the homocysteine values with latency of P300 wave (p<0.05).

**Discussion:** Vitamin B<sub>12</sub> deficiency impairs cognitive function in some patients. Evoked potentials in this study proved to be more sensitive than MMSE in useful for the diagnosis and evaluation of the efficacy of the treatment on cognitive functions. Homocysteine is the more important parameter correlating with cognition and must be evaluated in every case.

**Corresponding author:** Dr Nasreen Akhtar, 1655-C/15, Govind Puri, New Delhi-110019. (M):9899264164. Email: drnasreenakhtar@gmail.com

## **A comparative study of changes in mean arterial pressure (MAP) in male and female young adults before and after cold pressor test (CPT).**

P191

**Nazlin Hyder Choudhury<sup>1</sup> and Sharbani Barman<sup>2</sup>**

**AIMS AND OBJECTIVE:** Hypertension is a global health problem. CPT is a simple and well documented laboratory test to evaluate the propensity for hypertension and sympathetic autonomic function. It is often used to elicit alpha adrenergic vasoconstriction and pressure response in lab research on hypertension. Several researches have shown that cardiovascular response to CPT predicts the development of future hypertension. We extend this research by comparing mean arterial pressure between males and females before and after CPT.

**METHODS:** Study was conducted on 40 MBBS students. CPT was performed at around 4°C for a period of 2 minutes. We calculated MAP and compared between males and females by using student t test.

**RESULT:** Absolute rise in MAP in response to CPT was significant in both males and females ( $p < 0.05$ ), with males showing higher response.

**CONCLUSION:** Males show higher response to CPT compared to females. Hence males may be more prone to future hypertension. Still there is further scope of study which will throw more light on this topic.

Corresponding address: Dr. Nazlin hyder Choudhury, PGT 1<sup>st</sup> year, deptt of physiology, Gauhati Medical College, Guwahati-781032, Email: its\_liz2002@yahoo.com, 09401642489; 2.Dr. Shrabani Barman, Prof. and HOD, Deptt of Physiology, Gauhati Medical College, Guwahati.

## NCV study in cases of maturity Onset Diabetic Neuropathy

P192

Neeraj Mahajan, Kena Jasani, Jinal Pandya

**Aims and objectives:** To determine the role of NCV studies in the diagnosis and management of neuropathy in NIDDM patients.

**Methods:** The study was carried out at private EMG-NCV center at Ahmedabad in 2012. We have selected a total of 52 symptomatic cases of NIDDM (39 males and 13 females) aging between 32-88 yrs randomly. Median, radial, ulnar, sural, superficial peroneal nerves were studied for sensory and motor components.

**Results:** In our NCV studies, Amplitude, Conduction velocity and Late spinal responses were decreased in both sensory and motor nerves. NCV study of sensory component found that sural and superficial peroneal nerve were affected in 96.1% cases and ulnar nerve was affected in 88.4% cases. While for motor component of nerves, 48% of cases (upper limb) and 59.6% cases (lower limb) showed attenuated amplitude of the CMAP with slow conduction in 55.7% (upper limb) 46.1% (lower limb). Late spinal responses were delayed in 28.8% (upper limb) and 40.3% (lower limb). Most common clinical presentation in our studies were tingling numbness and difficulty in walking.

**Conclusion:** Our Study concludes that NCV studies are useful for early diagnosis of neuropathy in the cases of NIDDM. Our NCV studies showed that conduction abnormalities develop along the entire length of the nerve but more in distal than in proximal segments. Tibial and Peroneal nerves show more slowing than Median and Ulnar nerves. Sensory studies seem to be more sensitive than motor studies for detection of early polyneuropathy in adults.

**Corresponding address:** Dr. Neeraj Mahajan. 17, Devpriya Bunglows, Motera Stadium Road, Post Sabarmati. Ahmedabad - 380005. Email- neeraj.mahajan@gmail.com, Phone- 09426580490

## Baseline HRV predicts cardiovascular fitness in healthy young adults

P193

Neetha Shastry, Shailaja Moodithaya, Harsha H.N, Amrit. M. Mirajkar

**Aim:** To evaluate the association between baseline heart rate variability (HRV) measures and cardiovascular fitness in healthy young adults.

**Objectives:** (1) To test the strength of correlation between baseline HRV and heart rate recovery following isotonic exercise. (2) To test the strength of correlation between baseline HRV and Metabolic Equivalent (METs)

**Methodology:** Sixty healthy volunteers (30 males & 30 females) in the age group 18-24 years were recruited. Short term baseline HRV evaluation was done in frequency domains. Subjects performed modified Bruce protocol on motorized treadmill. Percentage of heart rate recovery (HRR) and METs were estimated.

**Results:** Analysis showed a significant positive correlation between post exercise HRR at 2<sup>nd</sup> minute and high frequency (HF) when expressed in absolute ( $r: 0.324$   $p < 0.05$ ) and normalised units ( $r: 0.317$   $p < 0.05$ ) which reflects cardiac vagal activity. Significant negative correlation was found between HRR at 2<sup>nd</sup> minute and low frequency (LF) power in normalised unit ( $r: -0.29$ ,  $p < 0.05$ ) which is modulated by sympathetic and parasympathetic systems. Baseline HRV (LF-r: 0.329, total power-r: 0.303,  $p < 0.05$ ) has significant positive correlation with METs.

**Conclusion:** Baseline HRV measures predict cardiovascular fitness as assessed by HRR and METs in healthy young adults.

**Corresponding address:** Dr Neetha Shastry, Post Graduate student, Department of Physiology, K.S Hegde Medical Academy, Mangalore-575018. Email: neethagauri87@gmail.com. Phone: 8762735716

### Study of severity & type of anaemia & its epidemiological determinants in pregnant women.

Neha Yashwant Biwalkar, Kanchan C. Wingkar and Swati S Jagtap

P194

**Aims & Objectives :** Because of population growth & poverty nutritional anaemia is very common important public health problem in rural India. So present study was designed to assess severity & type of anaemia in rural area of Karad (Maharashtra).

**Methodology :** 150 pregnant women visiting at Ob.Gynac OPD in Krishna Institute of Medical Sciences, Karad were studied by recording predesigned & structured history of pregnant women. Hematological studies as Total Hb, RBC Count, PCV, MCV, MCH & MCHC were calculated. All the pregnant women were taking Iron-Folic Acid supplementation.

**Result:** Out of 150 pregnant women studied. 85 (56.66%) cases were having normal Hb (11 & > 11 gm%) while 65 (43.33%) were having anaemia. Out of which 25 (16.66%) -were having mild anaemia, (10-10.9. gm%), 39(26%) were having moderate anaemia(7-9.9 gm%) & 1 (0.66%) having severe anaemia (<7gm%).

Mild to moderate anaemia was observed mainly in illiterate, multipara, vegetarian women having low economic status. It was observed that among 65 anaemic cases Microcytic Hypochromic were 36 (55.38%), Normocytic Hypochromic were 16 (24.61%), Normocytic Normochromic were 11 ( 16.92%) & Microcytic Normochromic were 2 (3.07%).

**Conclusion:** It was observed that even with Iron-Folic Acid supplementation 43.33% pregnant women were anaemic & majority were having Microcytic Hypochromic (55.38%) anaemia for which further research work is required to find out cause of anaemia. This is a pilot study, large scale study is required to confirm the findings.

**\*Corresponding Address:** Neha Y. Biwalkar, Department of Physiology, KIMSUDU, Karad, Dist.Satara, (Maharashtra)

### Study of neural plasticity in Braille reading visually challenged individuals.

Nikhath Yasmeen

P195

Department of Physiology, Shadan Institute of Medical Sciences, Hyderabad

**Background: Neural plasticity** is the brain's ability to adapt to the complete absence or the deterioration of a sense. Cortical mapping or reorganization is an evolutionary conserved mechanism which involves either an unmasking of previously silent connections of and/or sprouting of new neural elements

**Aims & Objectives:** To compare the Somatosensory evoked potentials(SSEPs) wave form in normal and visually challenged individuals

**Materials and methods:** 20 visually challenged males in the age-group of 21-31 yrs were studied. Subjects were screened for general physical health to rule out any clinical disorder, touch threshold and two point discrimination to rule out any peripheral sensory disorders likely to interfere with the study findings. Age & sex matched control group of 20 normal individuals were also studied. SSEPs were recorded on Nicolet Viking select neurodiagnostic system using 3-channel with normal averaging technique. Electrode Placing, nomenclature and methodology of SEP recordings were done according to Chiappa

**Results:** Data was subjected to various statistical analyses using SPSS version 17.0 software. N20 AND P25 latencies were shorter and amplitudes were larger in visually challenged compared to the age & sex matched normal individuals

**Conclusions:** In congenitally blind individuals, decrease in latencies indicate greatly improved processing of information in the nervous system and increase in amplitudes indicate the extent and synchronization of neural network involved in processing of information.

**Keywords:** SOMATOSENSORY EVOKED POTENTIAL, NEURAL PLASTICITY, BRAILLE READING.

**Corresponding Address:** Dr. Nikhat Yasmeen, Asst. Professor, Department of Physiology, Shadan Institute Of Medical Sciences, Hyderabad -500 008. Address-8-1-40/A/64, Samatha Colony, Tolichowki Hyderabad – 500 008; E-mail : yasmeen78692@yahoo.com; Phone : 08008994025

## Short-Term Effects Of Isotonic Handgrip Exercise On Cardiovascular Autonomic Functions In Healthy Young Adolescents

**Nilesh H. Patel, Wasim A. Shaikh, S. K. Singh**

P196

Department of Physiology, Pramukhswami Medical College, Karamsad, Gujarat, India.

E-mail: Nileshkumarhp@charutarhealth.org

**Aim:** As the compliance of people for routine form of exercise for BP control has not been very encouraging, we conducted a study to determine the short-term effects of isotonic handgrip exercise on blood pressure and cardiovascular autonomic functions in healthy adolescents with the objective to find a user friendly exercise which help in reducing blood pressure.

**Method:** A cross-sectional study was conducted on 60 young healthy adolescents (30 Boys and 30 Girls) in the age group of 17–19 years. Isotonic handgrip exercise was performed at the rate 12 contractions per minute (2 sec contraction/3 sec relaxation) at intensity of 30%MVC for 20 minutes using Ball-Squeeze Dynamometer. Blood pressure, vascular sympathetic reactivity (Isometric Handgrip Test and Cold Pressure Test) and cardiac parasympathetic reactivity (Deep Breathing Test and Valsalva Manoeuvre) was tested at baseline, immediate recovery phase and at 1 hour into the post-exercise recovery period.

**Result:** No significant difference was observed in blood pressure and cardiovascular autonomic reactivity during immediate and 1 hr post-exercise recovery after the prescribed exercise in both boys and girls.

**Conclusion:** We conclude that the exercise regime under consideration could not produce any short-term beneficial effects with respect to blood pressure and cardiovascular autonomic reactivity.

**Key Words:** Isotonic Handgrip Exercise, Blood Pressure, Cardiovascular Autonomic Reactivity

## Socio-demographic factors as predictors of change in state anxiety following yoga

P197

Nilkamal Singh, Shirley Telles, Acharya Balkrishna

Patanjali Research Foundation, Haridwar, India. Email: naosekpamkamal@gmail.com www.patanjaliresearchfoundation.com

**Aims and Objectives:** The present study aimed at determining whether (i) seven days of yoga practice would reduce state anxiety, and (ii) whether age, gender, severity of complaints, and baseline levels of state anxiety, could predict the extent of change in state anxiety after yoga.

**Methods:** A total of 499 participants who had enrolled for a seven day yoga program participated in the study. Their ages were between 22 and 75 years of age and there were 326 males. Participants were given the state anxiety inventory at baseline and after 7 days. A multiple regression analysis was conducted to determine whether age, gender, severity of stress or disease, and baseline levels of state anxiety could influence changes in state anxiety following yoga.

**Results:** There was a significant decrease in state anxiety after 7 days of yoga practice ( $P < 0.001$ ) and this was significantly correlated with baseline levels of state anxiety ( $\beta = -.416, P < 0.001$ ) and age ( $\beta = -.080, P < 0.05$ , at the one tailed level)

**Conclusion:** The results suggest that 7 days of yoga practice can reduce state anxiety. Baseline state anxiety and age can act as predictors of change in state anxiety following yoga.

## Attenuated Heart Rate Recovery Indices post exercise stressor during different phases of menstrual cycle: An Independent Predictor of Sympathovagal accentuated antagonism-A Cross-sectional study.

P198

Nirmala.S.Anand, Shivaprasad .S.Goudar.

Dept of physiology, Jawaharlal Nehru Medical College, BELGAUM

**Background:** Post exercise, decrease in HR after exercise is a function of the parasympathetic nervous system & further decrease in HR to pre exercise value depends on withdrawal of sympathetic system. Gonadal hormones are known to interact with the autonomic nervous system. Our study was designed to study the same.

**Objective:** To elucidate the relation between HR indices during different phases of menstrual cycle.

**Materials & Methods:** Thirty eumenorrhic females aged (18-20yrs) from 1<sup>st</sup> year M.B.B.S studying in J.N.M.C were recruited after ethical clearance, written & informed consent. Those demonstrating contraindication for exercise, OC pills users & who exercised 3 days/ week were excluded. Basal body temperature was noted. On the 10<sup>th</sup> (follicular) & 20<sup>th</sup> (luteal) days baseline HR was recorded using Naviquire software & subjects did an incremental ramp protocol using Balke protocol on a treadmill. Every 5 min the HR were recorded & continued till it reached pre exercise values. HRRI, % decline in HR (1&3 min) & HR recovery time were computed.

**Results:** Data was analyzed as Mean  $\pm$  SD & students paired t test was used.  $P < 0.005$  was considered statistically significant. HR was (129) bpm in luteal vs (110) bpm in follicular phase. HRRI was (60)<sub>1min</sub> (71.5)<sub>3min</sub> in follicular vs (58)<sub>1min</sub> (64.1)<sub>3min</sub> in luteal phase. % decline in HR was (59.2) in follicular phase vs (33.3) in luteal phase. Recovery time was (14) min in follicular vs (19) min in luteal phase.

**Conclusion:** Our results point towards a blunted vagal reactivation post exercise during the luteal phase.

**Corresponding address:** Dr. Nirmala.S.Anand, Asst.Professor, Dept of Physiology, Jawaharlal Nehru Medical College, Ph no-0831-2471544 Email: drnirm79@gmail.com



## Platelet count among south Indian population with respect to age, sex and food habit

Nivedita Sirdesai, NJ Shanmukhappa

Department of Physiology, JJM Medical College, Davangere, Karnataka

P199

**Aims and Objectives:** To study the platelet count among South Indian Population with respect to age, sex and food habits of the people.

**Materials and Methods:** 100 volunteers of both sexes, between age group of 17 and 35 years were studied. Platelet count of capillary blood samples was done by Rees Ecker method on same time of the day.

**Results:** The mean platelet count obtained among 100 subjects irrespective of age (17 to 35 years) is  $262 \pm 5$  (varies from 152 to 395) thousand/c.mm. The mean platelet count obtained for males and females are  $270 \pm 14$  and  $261 \pm 5$  thousands/c.mm respectively ( $p < 0.001$ ). The mean platelet count for vegetarians and non vegetarians are  $255 \pm 7$  and  $267 \pm 8$  thousands/c.mm respectively ( $P < 0.001$ ).

**Conclusions:** The platelet count of South Indian population does not deviate much with the different Western figures. Statistically significant change in count was noticed with regard to gender and food habits, but not with the age group of the subjects.

**Correspondence address:** Nivedita Sirdesai, Department of Physiology, JJM Medical College, Davanagere, Karnataka – 577 004; Email: dr.sirdesai.nivedita@gmail.com

## Integrating Expertise Hypothesis with Domain Specificity of Face Recognition: A Case of Exaptation?

Nivya Kolli, Magith Thambi, M.K Unnikrishnan

Manipal College of Pharmaceutical Sciences, Manipal University, Karnataka, India - 576104

P200

**Aim:** To integrate Expertise hypothesis with Domain specificity of Face Fusiform Area (FFA)

**Objective:** To reconcile conflicting roles of FFA through unifying principles of evolution

**Methods:** Systematic literature review and analysis of face recognition mechanisms in the context of a possible Exaptatory cascade triggered by Koinophilic mate selection

**Results:** Domain Specificity and the Expertise hypothesis of the Face Fusiform Area (FFA) apparently contradict each other, one demonstrating the domain specificity of FFA and the other illustrating category expertise and experience. Expertise hypothesis however contradicts face-selective responses in babies and the high degree of heritability of face recognition. FFA's roles that stretch beyond face recognition, viz. those in evaluating attractiveness, within-category recognition of objects (e.g. cars, birds, greebles), understanding degraded audios of human speech, remembering / recognizing chess board patterns etc suggest novel functions (exaptations) that extend beyond identification of individuality.

**Conclusion:** We hypothesize that the FFA primarily evolved by exaptation of the sensory neuronal networks that originally ensured mate-fitness by detecting and avoiding phenotypic aberrations through koinophilic mate-selection. Early exaptation of koinophilic mate selection skills enabled recognition of individuality through exception reporting. The ensuing exaptatory cascade, typical to humans, culminated in the redeployment of FFA for object-expertise and beyond.

**Corresponding Address:** M. K. Unnikrishnan, Professor, Manipal College of Pharmaceutical Sciences, Manipal University, Karnataka, India - 576104; Tel.: +91 820 2922454; Fax: +91 820 2571998; e-mail: mkunnikrishnan@gmail.com, unnikrishnan.mk@manipal.edu

## Understanding the insult to the brain due to inflammation

P201

**P. Elavarasi, Semmal**

Department Of Physiology, Sri Ramachandra Medical College And Research Institute, Porur, Chennai 600116

Systemic infection or inflammation give rise to signals that communicate with the brain and leads to changes in brain collectively known as Sickness behavior. Normal microglia are involved in the immune to the brain signaling pathway. After an insult to the brain by systemic inflammation leads to change in their local environment and enhance the synthesis of proinflammatory mediators which causes greater endothelial permeability. Recent evidence suggest that systemic inflammation causes increase in the symptoms of long standing neurodegenerative disease and thereby increasing the progression of the disease. Normal homeostasis of the brain which was maintained by microglia becomes less active when there is an insult by systemic inflammation. By prompt treatment of systemic inflammation or blockade of signaling pathways from periphery to the brain and by understanding the mechanism and causal pathways linking peripheral inflammatory markers with brain health and neuro inflammation will help to understand whether inflammatory markers can serve as surrogate markers of declining brain health. Peripheral inflammatory markers reflect underlying brain health and it is also needed to be checked by advanced techniques in neuro imaging which will say us about the level of aging because of the systemic inflammation and intervention at this level by the prompt treatment and all this can help to slow down the process of premature aging of brain.

## Differences in vocabulary comprehension, short-term and working memory between low socioeconomic and high socioeconomic bilingual children

P202

**Padmapriya K, Sujaya B , Sheetal C N**

**Introduction:** Bilingualism is present to some extent in every society. The developmental consequences of early childhood on bilingualism remain controversial. Family income, parental education, and occupational status are associated with a wide *array of health, cognitive, and socio-emotional outcomes in children.*

**Aims & objectives:** To assess the differences in vocabulary comprehension, short-term and working memory between low socioeconomic and high socioeconomic bilingual children.

**Methodology:** 60 children from low socioeconomic group and high socioeconomic group aged 5-7 years were examined. They were assessed using a battery of tests for children for vocabulary comprehension, short-term and working memory. All tests were conducted both in their native language and English.

**Results:** Children from high socioeconomic group performed better when tests were conducted in English while children from low socioeconomic group showed a similar difference in few of the tests conducted in their native language.

**Conclusion:** Vocabulary comprehension, short-term and working memory is influenced by the language frequently used by the children in their day to day life.

## A cross-sectional study of nerve conduction velocities among students and staff of Guahati Medical College in the age group of 20-60 years.

P203

Pallabi Duwarah<sup>1</sup>, Biju Dutta Choudhury<sup>1</sup>, Bonti Bora<sup>1</sup>, Marami Das<sup>2</sup>

1) Dept. of Physiology Guahati Medical College. 2) Dept. Of Neurology, Guahati Medical College

**Aims and Objectives:** To find out the change of sensory and motor nerve conduction study parameters with age.

**Methods:** A cross sectional study of randomly selected 30 healthy subjects from students and staff of Guahati Medical College in the age group 20-60 years fulfilling the inclusion criteria is taken NCS is carried out on dominant hand. Median nerve is tested for both motor and sensory nerve using machine Viking Quest EMG & Master copy software 48.0. Parameters that were studied for motor nerve are distal latency, CMAP & conduction velocity whereas for sensory nerve are SNAP and Conduction Velocity.

**Results:** Out of 30 subjects the mean and standard deviation of CMAP and SNAP of age group 20-40 years are  $58.26 \pm 2.17$  &  $45.83 \pm 6.47$  respectively. The mean and standard deviation of CMAP and SNAP of age group 40-60 years is  $49.31 \pm 1.91$  and  $34.46 \pm 1.06$  respectively both CMAP and SNAP are significantly decrease in the age group 40-60 years ( p Value < .05)

**Conclusion:** NCV decreases with increasing age in healthy individuals.

## Atherogenic index as a predictor of cardiovascular risk among women with different grades of obesity

P204

Pallavi Kanthe, B S Patil, Manjunatha Aithala

Department of Physiology. Shri B. M. Patil Medical College Hospital & Research Centre, BLDE University, Bijapur, Karnataka.

**Need of study:**Overweight and obesity represent a rapidly growing threat which has a greater influence on cardiovascular diseases.

**Aims & Objective:** Aim of present study was to assess an atherogenic index and lipid profile in obese women and to compare the same with non-obese women aged 40-55 years. As above mentioned parameters are associated with increased risk for cardiovascular diseases.

**Materials & Methods:**The study was conducted among 140 women (70-obese and70-non-obese) aged 40-55years. The study group was divided into four according to BMI; Group I ( BMI 25-29.9 kg/m<sup>2</sup>), Group II( BMI 30-34.9 kg/m<sup>2</sup>), Group III( BMI 35 – 39.9 kg/m<sup>2</sup>), Group IV (BMI > 40 kg/m<sup>2</sup>) including Control( BMI < 25 kg / m<sup>2</sup>). Anthropometric parameters like height (cm), weight (Kg), BMI recorded.In lipid profile we studied TC, HDL, TG, LDL, and VLDL. Atherogenic index was calculated as  $\log(TG/HDL-C)$ .

**Results:** The results showed that in middle aged women significant increase in atherogenic index with increasing BMI (p<0.05). We showed positive insignificant correlation between BMI and atherogenic index in obese group (r= 0.19, p= 0.113)

**Conclusion:** Obesity, no doubt alters lipid profile. A triglyceride based index (AI) can significantly add value when assessing the cardiovascular risk in obese women.

**Key Words:** Obesity, Body Mass Index, Lipid profile, atherogenic index

**Corresponding address:** Pallavi Kanthe, Department of Physiology, Shri B. M. Patil Medical College Hospital & Research Centre, BLDE University, Bijapur, Karnataka. E-mail id: mepallavipatil@gmail.com

## Role of academic performance on response of cardiovascular system to stress.

E.Pavithra, J.Shivakumar

Department of physiology; KIMS, Hubli - 22

P205

**Background:** There is a widespread belief that better academic performance entails hard work and consequent increased stress. In this background it becomes pertinent to examine the interaction between academic performance and stress responses pertaining to the cardiovascular system.

**Aim:** To study the role of academic performance on the following - basal, stress responses and recovery from stress of select cardiovascular parameters.

**Materials and methods:** The study group comprised of 10 male students of 1<sup>st</sup> year MBBS(Age:18-20 yrs) and 10 male students of 1<sup>st</sup> year BSc nursing(Age:18-20 yrs) the only difference between the two being their academic performance, with their 2<sup>nd</sup> PUC(Pre university course) marks serving as a surrogate for this. The procedure involved measurement of Heart rate, Systolic/Diastolic blood pressure under three experimental conditions i.e. basal (after 15 minutes rest), during mental stress task (serial subtraction task was used) and one minute post recovery. Heart rate measurements were done using lead II ECG recordings, whereas BP was measured using omron digital blood pressure monitor. Statistical analysis was done by using student's unpaired 't' test and a p value of <0.05 was considered as significant.

**Results:** The two groups were well matched as far as anthropometric data are concerned. There was no statistically significant differences of heart rate, SBP and DBP values between the two groups during all the experimental protocols.

**Conclusion:** Academic capability as assessed by 2<sup>nd</sup> PUC marks does not affect the basal values, mental stress response scores and recovery values of heart rate, SBP and DBP.

## A cross-sectional study of hemoglobin level among 1<sup>st</sup> year MBBS students of Gauhati Medical College with respect to Body Mass Index

Payel Dey, Jyotismita Deka, Biju Choudhury

Gauhati Medical College, Guwahati-781032

P206

**Aims & Objective:** Anaemia & obesity are two global public health problems affecting the young adults in developed as well as developing countries. Obesity has been identified as risk factor for cardiac and pulmonary disorders. Our study aims to evaluate hemoglobin level among 1<sup>st</sup> year MBBS students with respect to BMI.

**Methods:** This cross-sectional study randomly selected 30 numbers of 1<sup>st</sup> year MBBS students of Gauhati Medical College and estimated their hemoglobin levels by Cyanmethemoglobin method & BMI was calculated using Quetlet's Index. The prevalence of anaemia with respect to BMI was assessed.

**Results:** Among the 30 subjects, 46% had normal BMI (18.5-24.9kg/m<sup>2</sup>), 30% were overweight (>25kg/m<sup>2</sup>) & 23% were underweight (< 18.5kg/m<sup>2</sup>) having mean Hb (gm/dl) of 13.41±2.00, 9.95±1.28, 13.68 ±1.30 respectively. Unpaired Student t-test showed Hb level was significantly low in the overweight group (p value < 0.05).

**Conclusion:** High incidence of abnormal BMI in the above study population, and its association with low Hb level indicate the importance of nutritional guidelines and counseling programs for young adults.

**Corresponding address:** Dr. Jyotismita Deka, Assistant Professor of Physiology, Gauhati Medical College, Guwahati-781032, Email : drjyotismita77@gmail.com Phone number-09678001711

## **Area of educational field to which you carried out your work: innovation blended learning: experience in human physiology**

P207

**Pinaki Wani and Vrinda Dalvi**

Department of Physiology, K. J. Somaiya Medical College and Research Centre, Sion, Mumbai -22, Maharashtra, India

**Introduction:** The present study was aimed to understand the student's views and perceptions regarding the class room teaching and the blended learning systems and its future scope in teaching human Physiology.

**Method:** After the approval from Institutional Ethics committee, the project was conducted with 50 first MBBS students at the K.J. Somaiya Medical College, India. 4 topics in haematology and Gastro-intestinal Physiology were selected. Out of which, 2 haematology and 2 Gastro-intestinal Physiology topics were taken as blended learning and the remaining 2 haematology and 2 Gastro-intestinal Physiology topics were taken as a traditional class room teaching with no additional recourse material being provided. After the end of the entire session, the students were asked to fill the questionnaire regarding their experience about blended learning and class room teaching.

**Results:** The questionnaire showed 60-80 % students believing that blended learning helps in reinforcement and concept building process, it helps in revising the concepts as their own ease and time.

**Conclusion:** The present study showed a better acceptability of blended learning among the students concluding the need of incorporating blended learning in medical curriculum in India on a wider basis.

**Corresponding address:** Pinaki Wani, Department of Physiology, K. J. Somaiya Medical College and Research Centre, Sion, Mumbai -22, Maharashtra, India

## **Heart rate variability in type 2 diabetes mellitus**

P208

**Poonam S. Nandanwar, Mrunal S. Phatak**

Department of Physiology, Indira Gandhi Government Medical College, Nagpur.

**Aims and Objectives:** 1) To study and compare fasting, postmeal blood glucose and glycated Hb in patients of type 2 Diabetes mellitus and control.

2) To study and compare Heart rate variability (frequency domain) in patients type 2 DM and control.

**Method:** A total of 40 adults both male and female in the age group 30-60 years were recruited for the study. Out of 40, 20 were normal control from general population and 20 were type 2 diabetics of >10 year duration taken from patients attending diabetic OPD of the institution. Fasting and postmeal blood glucose and glycated Hb was done and ECG was recorded in resting state for 5 min in physiopac (PP-4) computerized polygraph from where the data is transferred to qubois software in which HRV was calculated.

**Result:** In diabetic individuals as compared to non diabetic individuals HRV study shows significantly reduced VLF, LF, HF and total power ( $p < 0.05$ ) with significantly increased glycated Hb levels ( $p < 0.05$ ). There was a positive correlation between Fasting and postmeal blood glucose and decreased frequency domain results of HRV ( $p < 0.05$ ).

**Conclusion:** Diabetes mellitus with <10 year duration is associated with decreased in LF & LF/HF ratio suggesting decreased sympathetic activity. In our study with diabetes mellitus of >10 year duration both HF and LF are decreased suggesting decreased sympathetic as well as parasympathetic activity.

## Computer literacy and internet usage among undergraduate medical students

P209

<sup>1</sup>Prabhavathi K, <sup>1</sup>Thilip Kumar D, <sup>1,2</sup>Ganesh Kumar P, <sup>1</sup>Saravanan A

<sup>1</sup>Department of Physiology, <sup>2</sup>Department of Community Medicine, SRM Medical College, Hospital & Research Centre, Kattankulathur, Chennai-603203

**Aim & objectives:** To assess the knowledge and usage of computer and internet among undergraduate medical students. (ii) To assess usage pattern of computer and internet in medical education

**Methodology:** A cross-sectional, questionnaire based study was conducted on 110 medical students of a private medical college

**Results:** Almost all (98%) own a computer with an internet connection. More than three fourth of the medical students were having a satisfactory knowledge on computer (79%) and internet (77%). The primary purpose of internet usage was for education (71%), email (71%) and entertainment (77%). Nearly 65% of students had knowledge on evidence based medicine and 36% knew about eHealth. None of them were aware about telemedicine. Students used internet mainly for searching latest trends & advances in medicine (61%). Most of the students (80%) agreed to incorporate computer education in medical curriculum.

**Conclusion:** The data obtained indicate that majority of medical students use computer and internet to access medical information. This justifies the need to incorporate internet and information technology into existing medical curriculum.

**Corresponding address:** Dr.K.Prabhavathi, Assistant Professor, Department of Physiology, SRM Medical College, Hospital & Research Center, Kattankulathur-603203 Fax Number: 044 -27453903 Email- prabhashruti@yahoo.co.in

## Impact of blood lead (Pb) on autonomic neuropathy and susceptibility of orthostatic hypotension in battery workers of Lucknow city

P210

Pradeep Kumar, Shyam Vinay Sharma, Virendra Atam, Anoop Verma and RC Murthy

Department of Physiology, KGMU, Lucknow, India.

**Introduction:** Cardiovascular disease is a leading cause of death in developed countries and developing countries like India. Acute and chronic lead (Pb) exposure leads to impairment of heart, vascular function including atherosclerosis and altered lipid metabolism.

**Aims and Objective:** The aim of the present study was to elucidate the effect of occupational lead exposure on cardio vascular risk in Indian workers subjects with normal BMI having increased blood lead level.

**Methods:** Standard battery of test was used for assessment of sympathetic and parasympathetic reactivity. Sympathetic reactivity was assessed by systolic blood pressure response during lying to standing and diastolic blood pressure response during handgrip test and cold pressure test (CPT). The parasympathetic reactivity was assessed by E:I ratio (expiration to inspiration) during deep breathing test (DBT), Valsalva ratio during Valsalva maneuver (VM), 30:15 ratio during lying to standing.

**Results:** Our data suggest that the higher level of lead (Pb) is causes neuropathy of both division of autonomic nervous system but parasympathetic division of ANS is more defective than sympathetic.

**Conclusion:** Higher level of blood lead may be one of the causes of orthostatic hypotension and other cardiac diseases and can be prevented.

**Corresponding address:** Pradeep Kumar, Professor, Department of Physiology, KGMU Lucknow, India. email: jenypradeep2002@yahoo.com

## Perceptions and awareness about the Lifestyle disorders among Malaysian adolescents

Prakash Paneerselvam<sup>1</sup>, Aswini Dutt. R, K. Shankar Bhat<sup>3</sup>

P211

<sup>1</sup> Second year MBBS Student, Yenepoya Medical College, Deralakatte, Mangalore, 575018. Karnataka, India.

<sup>2</sup> Associate Professor, Department of Physiology, Yenepoya Medical College, Deralakatte, Mangalore, 575018. Karnataka, India.

<sup>3</sup> Professor and Head, Department of Physiology, Yenepoya Medical College, Deralakatte, Mangalore, 575018. Karnataka, India.

**Introduction:** As the globalization takes place, lifestyle disorders are becoming a common thing day after day. The awareness should be created from the young in order to form a healthy society. The present study was prompted to determine the awareness of lifestyle disorders and its preventions among teenagers of a high school in Malaysia.

### Aims and Objectives:

1. To analyze awareness and perceptions about lifestyle disorders among teenagers using questionnaire.
2. To ensure definition of lifestyle disorders are well understood.
3. To educate about living a healthy lifestyle to prevent any disorders.
4. Understanding importance of maintaining healthy lifestyle.

**Methods:** The study group consisted of teenagers of both genders of a High School in Malaysia. A total of 51 students aged between 14 to 16 were selected. A cross sectional survey was conducted among the consenting subjects. Convenience sampling was used. Pre-tested questionnaires were administered and results were analyzed.

**Results and Conclusions:** Most of the respondents have the knowledge of the disorders of lifestyle such as hypertension, diabetes, obesity, and cancer. They also show their understanding of the disease such as the prevention, curability and communication of the diseases. There are few different perceptions about lifestyle disorders among boys and girls. However, they lack the awareness of risk factors and practise of healthy life style.

<sup>1\*</sup>: Presenting Author and Corresponding Author: (O) Second Year MBBS, Yenepoya Medical College, Deralakatte, Mangalore, 575018. Karnataka, India. Mobile: +91 8105448706 Email: prakashpaneer92@gmail.com

## Comparative study of P300 in girls with anemia & those with normal Hb level

P212

Pranali Kharat

**Aim:** This study was aimed to find out whether there is a variation in the cognition levels of females who have anemia as opposed to the ones who have normal hemoglobin level.

**Objectives:** (1).To study the Cognitive evoked potential in girls with anemia. (2). To study the Cognitive evoked potential in girls with normal Hb level. (3). To see if there is any difference in the amplitude and latency of p300 in the above groups.

**Methods:**The above study was carried out on 60 females in the age group of 17-20 years without any history of any major psychiatric illnesses, known metabolic diseases or consumption of any drugs or hearing defects. The haemoglobin of the above participants was measured using the Cyanmeth-hemoglobin method. The criteria for anemia was considered  $<12\text{gm}\%$ . The Cognition of the above participants was checked using the Evoked potential Machine- from Recorders and Medicare systems.In which the P300 wave (positive wave that peaks at 250-600msec) was evaluated using the auditory response to 'odd ball paradigm'.

**Results:** No significant co-relation has been found in the p300 components and Hemoglobin .( $p>0.05$  taken as significant).

**Conclusion:**An increase in sample size would possibly give a significant result. If any significant difference found later, it will be discussed at the time of presentation.

**Correspondence Address:**Dr.Pranali S.Kharat, Dr.Vaishampayan Memorial Government Medical College,Department of Physiology,Opposite to District Court,Solapur-413003Maharashtra, India.

## Retirement: prejudice against future cognitive decline

P213

Pranathi.R, Suguna S

Department of Physiology, Bangalore Medical College and Research Institute

**Aim:** To evaluate whether retirement affects cognitive performance.

**Objectives:**1)To compare cognitive performance between retired workers and retired non workers. 2) To assess the influence of engaged lifestyle, financial security and literacy on cognitive performance of retiree.

**Methods:** 50 retired non workers as cases and 50 retired workers as controls in age group 60-65 yrs selected after appropriate inclusion-exclusion criteria, informed consent taken and comparative parallel study is done. Brief Test of Adult Cognition by Telephone (BTACT) administered to all the subjects evaluates working memory span, verbal memory, attention, reasoning, verbal fluency and speed of processing. Results compiled and statistically analysed.

**Results:** Retired workers had better scores than retired non workers ( $p<0.05$ ). Highly educated retired non workers had better scores than retired workers ( $p<0.05$ ). Better financial security and active participation in leisure activities, retired non workers had better or equal scores compared to the retired workers ( $p>0.05$ ).

**Conclusion:** Results highlight negative impact of retirement on cognitive function which disappears or becomes positive when individual heterogeneity of literacy, financial security and engaged life style are considered. The 'use it or lose it' hypothesis is still consistent with our findings if stimulating mental activity is pursued into retirement.



**Corresponding address:** Dr. Pranathi R, "Sri Nilayam", 208 B Block, Adithya Greens Apartment, Bhuvaneshwarinagar, 2<sup>nd</sup> Cross, HAF Post, Bangalore: 560 024. Email id: dr.pranathi.r@gmail.com

### **Comparative analysis of the depression, stress, and anxiety levels in non obese, obese and overweight medical students**

P214

Pranjali D Raut, Dr Surendra Wadikar.

Department of Physiology, TNMC & BYL Nair Ch. Hospital, Mumbai Central-400008.

Email ID: pranjali2001@gmail.com

**Aims:** To compare the anxiety, stress and depression levels in Obese, Overweight and Non Obese medical students.

**Objective:** To investigate whether there is significantly increased levels of anxiety, stress and depression in obese medical students as compared to non-obese students.

**Methods:** 260 medical students of second MBBS from Nair Hospital, Mumbai in the age group of 18 to 22 years were studied during the non-exam period. They were divided into Control, Overweight and Obese groups based on BMI as per IOTF's recommendations. DASS-42 scale was used to assess depression, anxiety and stress levels. It is a 42-item questionnaire self report to measure negative emotional states of Depression, Anxiety and Stress.

**Results:** MANOVA results revealed statistically significant differences between control and obese, control and overweight and obese and overweight as regards depression, anxiety and stress. Post hoc Tukey HSD test was used for group wise comparison. For depression and stress, the difference was  $p < 0.001$ ; for anxiety levels between control and obese and between control and overweight it was  $p < 0.001$  whereas between obese and overweight it was  $p < 0.05$ .

**Conclusion:** It is concluded that depression, anxiety and stress levels were significantly higher in obese students compared to overweight and control group.

### **Effect of music on Visual and Auditory Reaction Time: A comparative study**

P215

Prasad.B.K

Dept of Physiology, SSIMS&RC, Davangere, Karnataka

**Aim & Objective:** To note the effect of background music on Visual and Auditory Reaction Time (VRT & ART).

**Methodology:** 30 subjects aged between 20-40yr having normal vision and hearing ability participated in the study. VRT and ART was recorded using Reaction time apparatus in a quiet room. Each type of stimulus was given 10 times randomly and the average reaction time for each type of stimulus was considered. Initially the recording was done without music and later with music in the background. Music played were rock of a bollywood song and instrumental.

**Results:** Paired t test applied showed statistically significant improvement ( $p < 0.05$ ) in VRT for yellow and green with music in the background either rock or instrumental and for red with rock music. Significant improvement ( $p < 0.05$ ) in ART was noted to medium pitch sound with music in background. For low pitch sound significant improvement noted to instrumental music. But for high pitch sound the improvement was not significant.

**Conclusion:** VRT improves with background music. ART for medium pitch sound improve with background music.

**Corresponding Address:** Dr.Prasad.B K, Associate Professor, Dept of Physiology, SSIMS&RC, NH-4 Bypass Road, Davangere, Karnataka- 577005 Fax: 08192-262633, 266310, Email id: docprasadbk@gmail.com , Mobile: 9916129941

## Grading of ABO and RH blood group agglutination reactions by simple microscopy

P216

**Prashant Devidas Khuje and Bharti Uddhav Sable**

**Aims & objectives :-**To emphasize in blood group determination by microscopy and to compare the grades of ABO & Rh agglutination reactions.

**Methods:-**Blood samples of 230 students of both sexes were determined for ABO & Rh grouping by mixing 1 drop each of red cell suspension and commercially available antiserum labelled pits on porcelain dish for 6-8 mins at 27°C by naked eye (NE) and by microscopy (M) under low power (10x) magnification. 220 agglutination reactions of A+, B+, AB+ and O+ blood groups were then graded according to the degree of haemolysis and RBC clumping. The data was statistically analysed by Chi-square test & Z test of proportion.

**Result:-**ABO antigen-antibody reactions showed significantly higher grades (A- NE  $Z=7.153$ , M  $Z=4.65$ ) (BNE  $Z=11.17$ , M  $Z=21$ ) [ $Z > 2.5$ ,  $P < 0.001$ ] than Rh antigen-antibody reactions. B antigen-antibody reactions showed insignificantly higher grades (NE  $Z=1.29$ , M  $Z=1.816$ ) ( $Z < 1.95$ ,  $P > 0.05$ ) than A antigen-antibody reactions. 28 negative reactions observed by naked eye examination were found to be positive by microscopy.

**Conclusion:-** ABO and Rh system antibodies are IgM (10 antigen binding sites) and IgG (4 antigen binding sites) respectively. Thus ABO system agglutinate or clumps showed higher grades (bigger) than Rh system agglutinate. B antigen-antibody reactions showed insignificantly higher grades than A which needs evaluation by immunological studies. Blood groups must be determined by microscopy to avoid false negative reactions noted by naked eye.

**Key words:-** ABO & Rh agglutination grading Microscopy

**Address for correspondence:-** Dr.Prashant Devidas Khuje, Asst.Professor (Dept of Physiology), C/o Dr.Poonam P.Sonare, Flat-6, Manas Vihar, Plot- 40, Raje shivaji nagar, Sector 16, Chikhali-Pradhikaran, Pune (M.S). Email drpdkhuje@ymail.com, Cell – 083903 60859, Fax. No.– 020 27805217

## Is cognition affected in young epileptic patients undergoing treatment?

P217

**Prashant Tayade, Anil Warkar, Mrunal Phatak, Shrinivas Chitta**

Dept. of Physiology, Government Medical College, Akola

**Aims and Objective:** Epileptic patient studies show a range from Good intelligence to severe cognitive impairment. It is studied that Power spectral analysis of EEG in Different wave bands helps in Neurophysiological assesment of cognition. It motivated us for our comparative study of Absolute Power in different wave bands of EEG in Epileptic subjects and Normal Subjects.

**Method:** 30 Diagnosed Epileptic patients undergoing treatment were Age matched with 30 normal subjects. Electroencephalogram was recorded using 32 channels EEG machine. Electrodes are applied according to 10-20 international system. Power spectral analysis, using Fast Fourier Transforms was applied on artefact free 4 second epoch samples of EEG data. Absolute Power values for different band width were analysed. Statistical analysis was done using SPSS software.

**Result and Observation:** We found a statistically non-significant difference in absolute power values in all electrodes between epileptic subjects and normal Subjects. Complete data is yet to be analysed and would be presented at the time of oral presentation.

**Conclusion:** Our study suggests that cognition is not affected in epileptic individuals undergoing treatment as compared to normal individuals.

**Corresponding Address:** Dr Prashant Tayade, Assistant Professor, Dept. of Physiology, Government Medical College, Akola. Email: -dr.prashanttayade@gmail.com

## A novel method for blood volume estimation using $^{51}\text{Cr}$ (III) in rabbit models

P218

**Prathap Baby<sup>1</sup>, Pramod Kumar<sup>2</sup>, Rajesh Kumar<sup>3</sup>, Dinesh Rawat<sup>3</sup>, Sanu Susan Jacob<sup>4</sup>**

<sup>1</sup>Department of Physiology, MMMC, Manipal University, <sup>2</sup>Department of Plastic surgery, King Abdul Aziz Hospital, Al Jouf, Saudi Arabia, <sup>3</sup>Department of Nuclear Medicine, KMC, Manipal University, <sup>4</sup>Department of Physiology, KMC, Manipal, Manipal University

*Corresponding Author:* **Prathap M Baby**, Faculty of Physiology, Fax No+91-820 2571905 E.mail :pratap.baby@manipal.edu

**Objectives:** To compare blood volume estimations using trivalent chromium [ $^{51}\text{Cr}$  (III)] and standard Evans blue (EB) method in New Zealand white rabbit models and establish correction factor (CF).

**Methods:** Blood volume estimation in 33 rabbits done using EB dye method and concentration determined using spectrophotometric assay followed by blood volume estimation using direct injection of  $^{51}\text{Cr}$  (III). 20 out of 33 rabbits were used to find CF by dividing blood volume estimation using EB with blood volume estimation using  $^{51}\text{Cr}$  (III). CF is validated in 13 rabbits by multiplying it with blood volume estimation values obtained using  $^{51}\text{Cr}$  (III).

**Results:** The mean circulating blood volume of 33 rabbits using EB dye was  $142.02 \pm 22.77$  ml or  $65.76 \pm 9.31$  ml/kg and using  $^{51}\text{Cr}$  (III) was estimated to be  $195.66 \pm 47.30$  ml or  $89.81 \pm 17.88$  ml/kg. The CF was found to be 0.77. The mean blood volume of 13 rabbits measured using EB dye was  $139.54 \pm 27.19$  ml or  $66.33 \pm 8.26$  ml/kg and using  $^{51}\text{Cr}$  (III) with CF was  $152.73 \pm 46.25$  ml or  $71.87 \pm 13.81$  ml/kg ( $p = 0.110$ ).

**Conclusions:** The estimation of blood volume using  $^{51}\text{Cr}$  (III) was comparable to standard EB method using CF. With further research in this direction we envisage human blood volume estimation using  $^{51}\text{Cr}$  (III) to find its application in acute clinical settings.

## Efficacy of Choline and *Clitorea ternatea* aqueous root extract supplementation in attenuating maternal separation stress induced alterations in postnatal rat hippocampus

**Prathibha D'almeida, Kiranmai S Rai**

P219

Department of Physiology, MMMC, Manipal University, Manipal, India.

**Background:** Perinatal maternal separation (PMS) is a stress to the infant & toddler during the period growth spurt. There are no studies available to prove the efficacy of choline and *Clitorea ternatea* in attenuating PMS stress induced alterations in hippocampus.

**Objective:** To study the efficacy of Choline and *Clitorea ternatea* (CTR) aqueous root extract in attenuating PMS stress induced alterations in hippocampus.

**Materials and Methods:** 4 group of animals - control, stress, stress + choline, stress + CTR. Each group contains 6 rats. PMS stress was given from PND 2- 21 for 6 hours.

**Histology:** Crysel violet staining of rat hippocampus.

**Statistics:** Data was analysed using one way ANOVA followed by Bonferroni's post hoc test with significance level at  $p < 0.05$ .

**Results:** Cell numbers are significantly increased in CTR and Choline treated groups ( $p < 0.001$ ), when compared to stress group.

**Conclusion:** Results substantiates the use of CTR and choline to alleviate the early life stress induced alterations in hippocampus.

**Corresponding address:** Prathibha D'almeida, Department of Physiology, MMMC, Manipal University, Manipal, India -576104. Prathibha.almeida@gmail.com, Fax-0820-2571905

### Evaluation of diuretic effect of *Lycium barbarum* Linn (*Goji berry*) in rats

P220

**Preethi G Pai, UmmaHabeeba, Ramya K, Pradeepthi M S, Yogeshbelagali**

Department of Pharmacology, Kasturba Medical College, Mangalore, Manipal University

**Background and aim:** Wolf berries or Goji berries (*Lycium barbarum* L. Solanaceae) have a long tradition as food and medicinal plant. The bark of Goji berries is generally harvested in the winter season and then dried to be used for diuretic purposes. Hence this study was designed to evaluate the possible diuretic effects of powdered *L. barbarum*.

**Materials and methods:** The study was conducted in saline primed Wistar albino rats ( $n=6$ ) using frusemide (10 mg/kg) as the reference diuretic drug with two oral doses, 250mg/kg/day and 500mg/kg/day, of the test drug. Urine volume and electrolytes (Sodium, Potassium and Chloride) excretion was estimated at the end of 24 hours and data was analyzed by ANOVA followed by Dunnett's test.  $P < 0.05$  was considered as statistically significant.

**Results:** *L. barbarum* statistically increased the volume of urine ( $8.08 \pm 0.35$  ml/100g/24hr and  $10.05 \pm 0.51$  ml/100g/24hr) in a dose dependent manner. There was a statistical significant increase in sodium ion excretion ( $143.17 \pm 9.5$  m.mol/L at 250mg/kg and  $182 \pm 8.25$  m.mol/L at 500ml/kg) when compared to the normal control ( $107 \pm 2.11$  m.mol/L). However, there was a statistically significant decrease in potassium ion excretion ( $47.17 \pm 4.1$  m.mol/L and  $30.17 \pm 2.4$  m.mol/L) when compared to the control ( $55 \pm 4.1$  m.mol/L).

**Conclusion:** These findings suggest that *L. barbarum* possesses diuretic activity and further studies elucidating mechanism of action are warranted.

**Corresponding Address:** Dr. Preethi G Pai, Department of Pharmacology, Kasturba Medical College, P.B. No.53, Light House Hill Road, Hampanakatta, Mangalore-575001 Karnataka, India. E-mail: meddocpai2@yahoo.com, Telephone number: Office: 91-0824-242227; Residence: 91-9880750040, Fax: 91 824 2428183

## Immediate effect of Kapalabhati on attention span of young healthy volunteers

P221

Prem Balaguru, Madanmohan

**Aim:** To study the immediate effect of Kapalabhati pranayam on attention span of young healthy volunteers.

**Methodology:** 30 college students of age group 19 – 22 who weren't practicing yoga volunteered for the study. In a calm & quiet environment, they were made to undertake two tests. i) Brief test of attention, ii) d2 test @ Concentration endurance test. Scores were recorded. The students were divided in to two groups. One group was asked to do Kapalabhati pranayam for 4 minutes. The other group was asked to remain calm and quiet. After 5 min, the same test was taken by both groups and the scores were recorded.

**Results:** The results showed significant increase in scores of brief tests of attention ( $p < 0.05$ ) in the group who performed kapalabhati but not in the control group. Whereas, the results for d2 test showed not a statistically significant change ( $p > 0.05$ ) in both groups, but the group that performed kapalabhati showed an increase in total score, and reduction in addition and omission errors.

**Conclusion:** This study shows that performing kapalabhati increases the attention span immediately, whereas the concentration endurance is not immediately increased. Probably the constant practice over time might produce an increase in concentration endurance.

## Effect of yoga on non insulin dependant diabetes mellitus patients

P222

Priyanka V Kadoo, M. T. Jivtode.

**Aims and objective:** 1) to study the effect of yoga on blood sugar levels in patients of NIDDM. 2) to find out the minimum duration of yoga practice that brings about a change in blood sugar levels.

**Methods:** 60 subjects having NIDDM of 0- 10 yrs duration are selected. They were subjected to Yogasanas including Surya namaskar, Tadasan, Konasan, Paschimottanasan, Ardhamatsyendrasan, gomukhasan, Shavasan, Padmasan, Pranayama, Pavanmuktasan, Sarpasan and Shavasan. Subjects were called to the cardio-respiratory laboratory in morning time and were given training by the *Yoga* expert. The *Yogic* exercises were performed for 30 - 40 minutes every day for 12 wks in the above sequence. They were prescribed medicines and diet. The basal blood glucose and glycosylated haemoglobin was measured and repeated at 0 wks, 4wks, 6 wks, 8 wks and 12 wks of *yoga asanas*.

**Results:** Statistical analysis was done using student t- test. Data is represented as mean  $\pm$  SD. There was a statistically significant decrease in fasting blood glucose (from baseline  $206.3 \pm 20.0$  to  $170.7 \pm 19.5$  mg/dl) and in Postprandial blood glucose (from  $292.3 \pm 22.0$  to  $268.7 \pm 19.9$  mg/dl). The glycosylated haemoglobin decreased from  $10.27 \pm 0.5\%$  to  $8.68 \pm 0.4\%$ .

**Conclusion:** Findings suggest that *yoga asanas* have a beneficial effect on glycaemic control and glycosylated haemoglobin in mild to moderate Type 2 diabetes and 6 wks is the minimum duration of yoga practice that brings about the change in blood sugar levels.

**Corresponding address:** Dr. Priyanka v kadoo, 139, nelco society , subhashnagar , Nagpur. Email: priyanka.kadoo@gmail.com

## Color vision in different intensities of light

P223

**Puneeth M, Venkatesh S**

Department of physiology, Bangalore Medical College and Research Institute

**Aims:** Color vision is the ability to make discriminations based on the wavelength composition of light. Intact color vision is mandatory for selection of posts related to driving, traffic services, railways and armed forces. Color perception may be influenced by a variety of factors of which intensity of ambient light is the most important. The optimum intensity of light for testing the color vision is not clearly defined. So there is a need to evaluate that optimum intensity of light to be used for carrying out color vision testing.

**Objective:** To evaluate the optimum intensity of light for testing color vision.

**Methodology:** 30 subjects in the age group between 15-25 years are subjected to color vision testing using Ishihara's chart in different intensities of light in a dark room. The subjects are instructed to read the numbers or trace the lines in each plate of the book at different intensities of ambient light. The intensity at which the subject is able to perform best is noted and the data is statistically analyzed.

**Results and conclusion:** At present, data collection is in progress and results are yet to be arrived at. The same will be presented in the poster.

**Corresponding address:** Dr Puneeth M, No.1553, 3<sup>rd</sup> A Cross, N.E.S Road, Sugappa layout, Yelahanka, Bangalore-560064. Email id: mail2coolpuni@gmail.com

## Effect of traffic congestion on mental health

P224

**Pushpa G, Venkatesh S**

Department of Physiology, Bangalore Medical College and Research institute

**Aim:** To study the negative emotional states of stress, anxiety and depression in city bus drivers

**Objective:** 1) To measure stress, anxiety and depression in city bus drivers

2) To compare the results with non drivers of similar working environment

**Methodology:** Comparative parallel study done with 30 male city bus drivers as cases and 30 male bus conductors working in the same environment as controls in the age group of 20 – 60 yrs. The study group was matched for working hours and socio economic status. An appropriate inclusion and exclusion criterion was excised and informed consent was taken. Depression Anxiety and Stress Scale (DASS), a 42 item questionnaire evaluating depression, anxiety and stress was administered to all subjects. Results compiled and statistically analyzed.

**Results:** Drivers were more stressed compared to non drivers which was statistically significant ( $p < 0.01$ ), whereas anxiety and depression scores showed a similar trend among drivers though without a statistical significance.

**Conclusion:** Results highlight that city bus drivers are more stressed compared to non drivers working in the same environment. Therefore measures to combat the stress need to be emphasized.

## Association between physical activity and sleep

P225

**Pushpa Krishna , Kaninika Panda.**

Department of Physiology, Kempegowda Institute of Medical Sciences, Bangalore

**Background:** Different levels of physical activity has shown to affect the sleep both qualitatively and quantitatively. This study aimed to evaluate the relationship between the different levels of physical activity and sleep duration.

**Material and Methods:** 82 adult males aged 18-25 years were recruited for the study. The subjects were found to be healthy following history and clinical examination. Physical activity level of each subject was assessed using Global Physical Activity Questionnaire. They were grouped into mild, moderate and high activity levels depending on MET values. Self reported average sleep duration over the last one month was noted for all.

**Results:** Low (n=16), moderate (n=40) and high (n=26) groups of activity level had sleep durations of  $6.97 \pm 1.38$  hrs,  $6.48 \pm 1.51$  hrs and  $6.52 \pm 1.77$  hrs respectively. There was no significant difference ( $p=0.343$ ) in the sleep duration between the three groups even after adjusting for BMI.

**Conclusion:** No association was found between physical activity levels and sleep duration in the present study.

## Leptin – a new armament in the crusade against diabetes mellitus?

P226

**R Hemavathy, S Chandra MD, Senthilvelou MD**

Department of Physiology, Sri Manakula Vinayagar Medical College and Hospital, Madagadipet, Kalitheerthalkuppam, Puducherry - 605 107; Email address - rhbnithin@gmail.com Tel no – 9486677940,9994625846

Insulin resistance plays an important role in the pathophysiology of T2DM {Type 2 Diabetesmellitus} along with impaired insulin secretion and excessive hepatic glucose production .Insulin resistance is the reduced ability of insulin to decrease the plasma glucose level by acting effectively on peripheral target tissues, especially muscle and liver.[current researches show evidence of involvement of PI-3-Kinase {Phosphoinositol -3-Kinase} signaling defect, a defect in insulin signal transduction pathway, which reduces the translocation of GLUT4{Glucosecotranspoter4} to the plasma membrane] in the pathogenesis of insulin resistance.

According to DCCT{Diabetes complication and control trial} intensive insulin therapy improves insulin sensitivity and glycemic control but at the cost of increased frequency of severe hypoglycemia, weight gain and hypercholestroemia. Researchers from the University of Geneva, have found that leptin, a hormone from the fat cells, could be an alternative to insulin treatment, as it mimics the insulin in its mechanism of action i.e., intracellular signaling via the enzyme PI3kinase,without its accompanying complications like hypoglycemia and weight gain. They also have identified the peripheral tissues like liver, soleus muscle and brown adipose tissue where leptin could act during insulin deficiency, which probably could be targeted in future for treatment. In addition, leptin also normalized the elevated plasma glucagon levels as well as increased hepatic expression of gluconeogenic genes G6Pase{Glucose-6-phosphatase} and PEPCK{Phosphoenolpyruvatekinase} which are also implicated in the pathogenises of insulin resistance and diabetic hyperglycemia. Increased glucocorticoid secretion due to Hypothalamic-Adrenal-Pituitary Axis(HPA) activation also contributes to insulin resistance, as it both inhibits peripheral glucose uptake in muscle and adipose tissue and induce hepatic expression of G6Pase and PEPCK . Leptin replacement normalized this elevated plasma corticosterone levels in STZ{Streptozocin}-induced diabetic rats.

As some of the important functions of insulin is mimicked by leptin, humans may get benefited from correcting both insulin and leptin deficiencies, instead of correcting only insulin deficiency.

## Expression analysis of Neurotrophic Factors in the rat model of Sporadic Amyotrophic Lateral Sclerosis

P227

R Sumitha, Vandhiyathevan R, Vijayalakshmi K, TN Sathyaprabha, A Nalini, Phalguni Anand Alladi, Trichur R Raju

Department of Neurophysiology, NIMHANS, Bangalore

**Aim and Objectives:** To evaluate the expression of Vascular Endothelial Growth Factor (VEGF) and Brain Derived Neurotrophic Factor (BDNF) in the rat model of Sporadic Amyotrophic Lateral Sclerosis (ALS).

**Methods:** CSF from patients suffering from ALS (ALS-CSF) or other non-neurodegenerative diseases (NALS-CSF) was intrathecally injected in Wistar rat pups. The lumbar region of the spinal cord was further analysed. VEGF mRNA expression was analysed using Quantitative Real Time PCR. VEGF and BDNF protein expression were analysed using immunohistochemistry and laser scanning confocal microscopy.

**Results:** Expression of both the growth factors was significantly reduced in the extracellular matrix of the ventral horns of the ALS-CSF injected animals. In the alpha motor neurons, while BDNF expression reduced significantly ( $p < 0.01$ , v/s NC), only a trend of reduction was seen with VEGF expression (16%). Further, VEGF mRNA levels remained unaltered, while our earlier studies have shown a 6-fold reduction in BDNF mRNA in the ALS group.

**Conclusion:** ALS-CSF affects the tissue BDNF expression at transcriptional and translational levels. In view of the reduction in the extracellular matrix, an effect on the glial/non-neuronal cells can be envisaged. VEGF expression may be affected predominantly at the post-transcriptional level. Thus insufficient trophic support contributes to ALS pathogenesis.

**Acknowledgment:** The project was funded by Indian Council of Medical Research: Project no. 5/4-5/7-Neuro/2009-NCD-I dated 16/3/2010.

## Noise Stress induced neural modifications in brain areas and possible herbal actions

P228

R. Sheela Devi

Department of Physiology, Dr. ALM Post Graduate Institute of Basic Medical Sciences, University Of Madras, Taramani Campus, Chennai

**Aim:** Whether an unavoidable stressor like noise could induce changes and such changes could be resisted by herbal actions.

**Objective:** Whether noise stress induced changes in the antioxidant status of cerebral cortex and hypothalamus if any, could be protected by the actions of *Ocimum Sanctum Linn*.

**Methods:** Male Wistar strain albino rats in 4 groups namely control (180-200gm), control fed with *Ocimum Sanctum Linn* (100mg/kg body weight), noise stress exposed (100dB for 4hrs/day for one day and 15 days) animals and noise stressed animals treated with *Ocimum Sanctum Linn* were studied. The corticosteroids in plasma and antioxidant status by altering the enzymatic such as superoxide dismutase, catalase, glutathione peroxidase and non-enzymatic Glutathione, protein thiol levels along with lipid peroxidation were estimated in brain cerebral cortex and hypothalamus. The data were analyzed with one way analysis of variation followed by Tukey's multiple comparison (SPSS 18 Package).

**Result:** Noise stressed animals showed a marked increase in the LPO, SOD, GPx and catalase with the marked decrease in reduced Glutathione, protein thiol levels compared to control as well as stress exposed animals whereas *Ocimum* treated animals could maintain the normal level in the entire parameter studied except the glutathione peroxidase level in hypothalamus.



**Conclusions:** Noise is not an adoptable stressor and induces free radicals in brain regions studied and *Ocimum* could be an anti stressor as it could resist the changes.

**Corresponding address:** Dr. R. Sheela Devi, Graduate Institute of Basic Medical Sciences, University Of Madras, Taramani Campus, Chennai-113

### Effect of aqueous extract of *Murraya koenigii* (L.) Sprengleaves in experimental models of pain

P229

**Rachna Gupta, SK Bhattacharya**

Department of Pharmacology, University College of Medical Sciences and GTB Hospital, New Delhi 110095, India

**Background:** In the Ayurvedic System of Medicine the leaves of *Murraya koenigii* (L.) Spreng have been used in many ailments to treat pain including stomachache, rheumatism and traumatic injury. Aim: This study investigated the antinociceptive effects of aqueous extract of *Murraya koenigii* (AEMK) leaves (200, 400 and 800 mg/kg, orally) on animal models of acute and persistent pain.

**Materials and methods:** Antinociceptive effects were assessed using tail-flick, hot plate and formalin tests in mice. Morphine was used as a standard drug.

**Results:** AEMK and morphine significantly increased the tail-flick latency (tfl) and paw licking /jumping latency in tail-flick and hot plate tests, respectively, in comparison to control. Also, in both the tests AEMK and morphine significantly increased the  $AUC_{0-120min}$ . In formalin test, AEMK (400 mg/kg and 800 mg/kg) and morphine significantly reduced licking time in both early and late phases in comparison to control.

**Conclusion:** In all three pain models AEMK showed antinociceptive effect. Hence, leaves of *Murraya koenigii* (L.) Spreng could have analgesic potential.

**Corresponding address:** Rachna Gupta, Department of Pharmacology, University College of Medical Sciences and GTB Hospital, New Delhi 110095, India ; Email: drrachna1@rediffmail.com; Fax: +91-11-22590495

### Effect of increased adiposity on ocular perfusion pressure in young adults

P230

**Rajalakshmi R, Gowd Aruna R**

Sridevi Institute of Medical Sciences & Research Hospital, Tumkur

**Aims & objectives:** The objective of this study was to study the effect of increased adiposity on Ocular Perfusion Pressure (OPP) and its relation with obesity indices.

**Methods:** The study included 82 young adults grouped into two based on their BMI as obese group (n=41) and Normal group (n=41). Systolic & Diastolic Blood Pressure was measured using standard sphygmomanometer. Mean Arterial Pressure (MAP) was calculated. IOP was recorded using Schiottz indentation tonometer after anaesthetizing the cornea with 2% paracaine solution. OPP was calculated as 2/3 the MAP minus IOP, Systolic Ocular Perfusion Pressure (SOPP) was calculated by SBP minus IOP and Diastolic Ocular Perfusion Pressure (DOPP) was calculated by DBP minus IOP. Statistical analysis was performed using the SPSS version 19.

**Results:** Resting mean SBP, DBP, MAP, IOP, OPP, SOPP & DOPP were significantly higher ( $p < 0.05$ ) in the obese group. IOP, OPP, SOPP & DOPP were significantly positively correlated with all the obesity indices. BMI was the most important individual parameter in prediction of IOP where as WHR & WC was the major predictors for OPP, SOPP and DOPP.

**Conclusions:** The study thus shows that Ocular perfusion pressures were significantly affected by the increase in adiposity in young adults.

**Corresponding address:** Dr Rajalakshmi R, Associate Professor, Department of Physiology, JSS Medical College, Mysore-15 Email: rajashk\_7@yahoo.co.in Mob No: 9448150501

## Is there any correlation between memory and brain metabolites in type 2 diabetes

Rajani Santhakumari<sup>1</sup>, IndlaYogananda Reddy<sup>1</sup>, Archana R<sup>2</sup>;

P231

<sup>1</sup>Mediciti Institute of Medical Sciences, Hyderabad; <sup>2</sup>Saveetha Medical College, Chennai

Memory is one among the 5 domains of cognition, which is affected in type 2 diabetes. We are aiming to see if there is any correlation between memory and brain metabolites in type 2 diabetes. We have selected 10 subjects of type 2 diabetes, both sexes are included, minimum educational qualification is 10<sup>th</sup> standard. Subjects are divided into test group (5), who are doing yoga asana and pranayama daily for one hour since one year, and control group (5) who are not doing any specific exercise apart from their daily routine work. PGI-memory scale which is a part of PGI-BBD (PGI- Battery of brain dysfunction) is used in assessing the memory. Brain metabolites are measured by using magnetic resonance spectroscopy. P value for PGI-BBD memory scale is <0.05, which is statistically significant. The obtained values of metabolite ratios lie within 95% confidence interval, and are suggestive of the non-significant corresponding mean. Therefore, it is concluded that there is no correlation between the brain metabolites and memory in type 2 diabetes.

**Corresponding address:** Rajani Santhakumari, Assistant professor, Dept. of Physiology, MediCiti Institute of Medical Sciences, Ghanpur, Medchal, Hyderabad-501401; Cell no-09866439595; Fax-08418256254; Email:rajaniprabath@gmail.com

## Comparative study of RR, PR and JT intervals during the different phases of menstrual cycle

Rajeshwari L., A.R.Gorkal

P232

Department of Physiology, JSS Medical college & Hospital, JSS University, SS Nagar, Mysore. Karnataka, India

**Aim:** Cardiac function is influenced by gender & gonadal steroids. Ventricular arrhythmias are more common in women and seem to exhibit during the menstrual cycle. JT interval is major component of QT intervals. It measures ventricular repolarization. According to literature, estrogen lengthens the JT interval. Hormonal changes during menstrual cycle may cause changes in ECG intervals.

**Objective:** The objective of the present study is to evaluate the effect of different phases of menstrual cycle on the RR, PR & JT intervals of ECG.

**Methods:** This is a prospective study among a cohort of 30 healthy female students, who were aged 18-22 years and had regular menstrual cycles over past six months. Subjects were monitored on three separate occasions during two consecutive menstrual cycles. ECG was recorded for 5 minutes in Lead -II using Powerlab multichannel polygraph instrument, once during every phase. The computerized recordings of RR, PR & JT intervals thus obtained were analyzed statistically using one way ANOVA test, probability < 0.05 to assess if any significant difference existed in these parameters during the different phases of menstrual cycle.

**Results:** This study did not show any statistically significant variation in RR, PR and JT intervals between the menstrual, follicular and luteal phases of the menstrual cycle.

**Conclusion:** It may be concluded that there was no statistically significant variation in RR, PR and JT intervals during different phases of the menstrual cycle which may be due to the small sample size.

**Corresponding address:** Dr Rajeshwari L., Email:raj0522004@gmail.com

## Comparative study of IOP and its correlation with HbA1C in non hypertensive and Hypertensive Type II Diabetic patients

P233

**Rakhee Ambade, Ajay Ambade, Mohan Sagdeo, Sunil Gupta**

Department of Physiology. NKP salve Institute of Medical Science and Research Centre digdoha hills, Hingna road, Nagpur

**Aims and Objective:** To find out the IOP in Hypertensive Diabetic and non hypertensive diabetic and its correlation with HbA1c in Type II DM.

**Study design:** It is cross sectional comparative study of 129 eyes of 27 females and 40 males in age group 55.32+9.85 yrs. The IOP, Visual acuity, HbA1c, BMI, Fasting Glucose, Postmeal Glucose were obtained according to Ethical Standards and Helsinki Declaration. The basic data segregated as nonhypertensive diabetic and hypertensive diabetic and compared; and correlation of IOP with HbA1c evaluated by *Student t test* and *Pearsons Corelation* respectively. Multiple regressions Analysis were done where ever required for parameters.

**Result:** The data revealed non significant difference between BMI ( $P=0.9784$  as per *t-test for independent samples*), Visual acuity. ( $P=0.8385$ , as per *Wilcoxon rank sum test*). IOP ( $p=0.8988$ ) in both groups. There were no significant difference in male and female IOP both Non hypertensive ( $0.024377$ ) and Hypertensive Diabetic ( $P=0.9278$ ). Nonsignificant negative correlation ( $r = -0.1507$ ,  $p=0.291$ ) were found between HbA1C and IOP in patients with diabetes without hypertension, while positive correlation ( $r = 0.1886$ ,  $p=0.098$ ) is obtained between HbA1C and IOP in patients with diabetes with hypertension which failed to reach significant.

**Conclusion:** In conclusion, male and female both affected equally as visual outcome is same for both gender. There is increase tendency of IOP in hypertensive diabetic as compared to non hypertensive diabetic with poor glycemic control

Keywords: IOP, HbA1c, visual acuity,

**Corresponding address:** Rakhee Ambade, Department of Physiology. NKP salve Institute of Medical Science and Research Centre digdoha hills, Hingna road, Nagpur 440019. College ph.07104-236290, 236291, 232878, College fax: 07104-232905. Email: rakhee\_t@rediffmail.com, Mobile: 9823090322

## Heart rate variability in obese and non-obese school children

P234

**Ramya CS, Karthiyanee Kutty, Vinutha Shankar.**

**Background and objectives:** Obesity causes alterations in the function of the autonomic nervous system (ANS) in children and adolescents. Heart rate variability is a simple and non-invasive indicator for the detection and investigation of possible cardiac autonomic dysfunction.

**Aim:** To compare heart rate variability among obese and non-obese school children.

**Materials & methods:** 80 healthy children aged between 10-14 years, taken from the population in Kolar district, distributed into two groups based on BMI more than or equal to 95<sup>th</sup> percentile were considered obese. The

anthropometric measures height and weight of all children was measured. Heart rate was recorded using in house built Analogue ECG Amplifier machine beat by beat as the children rest in supine position for 5 minutes. Heart rate variability analysis was carried out using time and frequency domain analysis.

**Results:** The STDRR, RMSSD, pNN50, HFnu and LFnu recorded were significantly reduced in obese children than non obese. Showing reduction in both parasympathetic and sympathetic activity in obese children.

**Conclusion:** There is hypo activity of sympathetic and parasympathetic nervous system in the obese children implying reduction in heart rate variability in childhood obesity.

## **The effect of smoking on heart rate variability and hand grip dynamometer test in young adult males**

P235

**Rani Gupta, Yogesh Saxena, Sukhmani Saini\***

**Objectives:** To evaluate Autonomic Functions in adult male smokers and to find an association if any, between altered autonomic function & smoking.

An observational analytical study was done on 70 volunteers living in HIHT University, Dehradun. They were grouped as Cases (n=35, smoking history>6months) and Controls (n=35- nonsmokers). Study tools in the form of Structured Study instruments were used to generate data. Study protocol included relevant medical & smoking history, Anthropometric indices, Physiological Parameters Resting Pulse Rate, BP. HRV analysis was used to measure autonomic parameters (LF, HF, and LF: HF) using Polygraph machine (MEDICAID systems); Hand Grip Dynamometer Test was used to assess the sympathetic tone. Descriptive analysis was made using Mean±SD for continuous variables. The Student's T-test for mean difference & Pearson's co-relation for association of smoking with ANS dysfunction.

**Results:** Comparison of Sympathetic Activity using Hand Grip Dynamometry, among smokers and nonsmokers showed a highly significant difference ( $p < .00$ ) in the change in Diastolic BP. HRV Analysis showed a significantly ( $p < .00$ ) higher LF, and LF : HF ratio in the smoker's group. HF values were significantly higher in the non smokers ( $p < .00$ ). Pearson's correlation showed a significant association between smoking and Autonomic Dysfunction. ( $r = -.296$  ;  $p < .05$ )

**Conclusion:** Sympathetic Activity is significantly higher amongst smokers which can have a causal effect on cardio-vascular morbidity among them. Evaluation of autonomic dysfunction among smokers may be of value in primary & secondary prevention.

**Presenting and Corresponding author:** Dr Sukhmani Saini, Department of Physiology, HIHTU, Dehradun 248140. Phone - 09761246715

## **Effect of Orexin B antagonist (TCS-OX-29) infusion into Basolateral Amygdala in Wistar rats on ingestive behaviour.**

P236

**Rashmi KS, Santhosh Mayannavar, Keerthi Deshpande, Ganaraja B\***

**Aims and objectives:** To elucidate role of newly discovered Orexin in the control of ingestive behaviour which is speculated and also its role in amygdala mediated functions. Orexin B antagonist microinfusion into BLA will be studied.

**Methods:** In the present study Orexin B antagonist infusion into the Basolateral amygdala in Wistar albino rats. Three groups of male rats, inbred in the laboratory (n=6 each), served as Control, Sham operated control and Infusion group. In the infusion group, TCX-OX2-29 was infused bilaterally into the BLA at a dosage of 10 micrograms per microliter, and their food intake and water intake were measured meticulously after 1 hour, 2 hours, 4hours and 24 hours.

**Results:** The rats consumed less food and water following infusion after 2 hours period and next reading (4<sup>th</sup> hour) but in the first hour there was no change in their intake, there was no significant changes in the intake for 24 hours also.

**Conclusion:** This result suggested that blocking Orexin 2 action leads to decrease in food and water intake suggesting a regulatory role for Orexin in BLA.

**Key words:** Basolateral amygdala, Orexin B antagonist, Food intake, water intake.

**Corresponding Address:** Additional Professor, Department of Physiology, KMC, Mangalore(A Unit of Manipal University) email: ganaraj.b@gmail.com Ph: 9449642150

## Cardiometabolic Risk Factors are Modified by a Short-term Yoga Based Lifestyle Intervention in Overweight/ Obese Subjects

P237

Rashmi Yadav\*, Pragati Pragya, Amit Tomar, Raj Kumar Yadav, Nalin Mehta

Integral Health Clinic, Department of Physiology, All India Institute of Medical sciences, New Delhi, India

**Background:** Obesity, a worldwide health problem is related to the development and acceleration of cardiometabolic risk factors, thereby increasing chances of metabolic syndrome predisposing to cardiovascular mortality and morbidity.

**Aim & Objectives:** To assess the efficacy of short-term yoga based lifestyle intervention on cardiometabolic risk factors in overweight/ obese subjects.

**Material and methods:** A total of 91 overweight / obese subjects (BMI=28.88 ± 4.54 Kg/m<sup>2</sup>) of both sexes (30 males and 61 females) having age range (39.68±10.44 Yrs) were assigned to Yoga based lifestyle intervention for 10 days at Integral Health Clinic, Department of Physiology, AIIMS. Anthropometric and biochemical parameters were assessed on first and last day of intervention.

**Results:** There was statistically significant decrease from baseline Vs day 10 in weight (72.43 ± 11.43 Vs 71.70 ± 11.24 Kg; p< 0.001); body mass index (28.88 ± 4.54 Vs 28.59 ± 4.79 Kg/m<sup>2</sup>; p< 0.001); waist-to-hip ratio (0.912 ± 0.89 Vs 0.902 ± 0.083; p= 0.010); total cholesterol (176.03 ± 29.29 Vs 168.93 ± 28.23 mg/dL; p=0.003); triglycerides (120.36 ± 59.20 Vs 107. 47 ± 45.72 mg/dL; p=0.004); VLDL-C ( 24.05 ± 11.83 Vs 21.60 ± 9.24; p= .008) and fasting blood glucose (105.89 ± 15.30 Vs 101.46 ± 14.71 mg/dL; P< .001). Furthermore, meaningful improvement was observed in waist circumference, HDL-C and LDL-C however changes were statistically non-significant.

**Conclusion:** Significant improvements in weight; body mass index, total cholesterol; triglycerides; fasting blood glucose within 10 days suggests that short-term yoga based lifestyle intervention may benefit in improving cardiometabolic risk factors in overweight/obese subjects.

**\*Corresponding author:** Rashmi Yadav, Integral Health Clinic, Department of Physiology, All India Institute of Medical sciences, New Delhi, India

E-mail: rashmy87@gmail.com

## Prednisolone Partially Prevents The Oleic Acid-Induced Acute Lung Injury In Adult Rats

Ratna Pandey\* Dinesh Singh and Sripad B. Deshpande

P238

Department of Physiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Pin- 221005, India

**Aims:** Acute lung injury (ALI) is a common devastating clinical syndrome with high mortality but the mechanisms and therapeutic regimen remains undefined.

**Objectives:** ALI is associated with diffuse alveolar damage, up regulation of inflammatory response and over expression of glucocorticoid receptor. Therefore, the present study was undertaken to examine the effect of methylprednisolone (an anti-inflammatory drug) in ALI.

**Methods:** Tracheal cannulation, arterial cannulation (to record B.P.) and jugular vein cannulation (to deliver O.A./saline/drug) was done in anesthetized rats. Acute lung injury was induced by i.v. injection of oleic acid (OA). Animals were divided in three groups; O.A. (60  $\mu$ L) treated group, saline treated (control) group and methylprednisolone (60 mg/kg i.v.) + O.A. treated group. Respiratory rate, heart rate and blood pressure was recorded. Pulmonary water content was determined. Histological examination of lung was also done.

**Results:** Oleic acid produced initial increase followed by progressive decrease in respiratory rate. This was associated with significant decrease in heart rate and mean arterial pressure leading to death within 45 min. Massive pulmonary edema and polymorphonuclear cell infiltration was observed in histological examination. In methylprednisolone pretreated group, toxicity was not observed in the initial phase and survival time of animals was prolonged but it failed to prevent lethality.

**Conclusion:** Anti-inflammatory drug, methylprednisolone decreased the oleic acid-induced toxicity in the initial phase and prolonged the survival time but failed to prevent lethality. However, other mechanisms need to be explored.

**Corresponding Author:** Ratna Pandey, Department of Physiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi. Pin- 221005. E mail: ratna93@yahoo.co.in

## Event related potentials in migraine patients

P239

Ravikiran Kisan, Arun, Ajay, Nirmala, Sujan MU, A Nalini, Raju. T.R., Sathyaprabha T.N., Bindu M Kutty

Department of Neurophysiology, NIMHANS, Bangalore

**Aim :** To evaluate the event related potentials in migraine patients.

**Objective :** To compare the event related potentials (Contingent negative variation (CNV) and P300) in migraine patients and healthy controls.

**Methods :** Twenty subjects were studied for the assessment of CNV and P300. Out of the twenty subjects studied, ten were migraine patients (mean age  $26.20 \pm 1.82$  years; Men:Women 4:6) and ten healthy controls (mean age  $27.30 \pm 3.62$  years; Men:Women 4:6). Recordings were carried out in video monitored, semi-sound proof cabin of the laboratory for human consciousness studies of the department of Neurophysiology. Subjects were seated comfortably in a reclining chair. EEG was recorded using 64 channel Quick cap electrodes based on the 10-10 system of electrode placement in Neuroscan EEG acquisition system. The electrical impedance was kept below 5 KOhms. EEG acquisition was done at a sampling rate of 1000Hz, resolution 32 bit and band-pass filtered between 0.1Hz and 100Hz.

Development of the stimulus paradigms (CNV and P300), stimulus delivery and behavioural response collection were performed using STIM2, stimulus presentation software synchronized with the EEG recording system. The EEG recordings obtained during these paradigms were pre-processed, epoched, sorted and averaged offline using EDIT, the EEG analysis software. The experimenter was blinded as to which group the subjects belonged to, to avoid bias in the analysis.

**Results :** Migraine patients showed increased latency and amplitude of P300. The iCNV (initial CNV) (between 500 to 750 ms) amplitude was enhanced with reduced latency.

**Conclusions :** Migraineurs have showed reduced CNV latency and increased CNV and P300 amplitude indicating increased cortical excitability and increased cortical processing with enhanced mobilization of attentional resources, type of abnormal information processing in them. Increased negative amplitude in early part of CNV reflecting abnormal excitability of cortical networks in information processing is found in migraine patients. P300 amplitude is more in migraine patients reflecting higher level of attention.

## Students' perceptions regarding poster presentation associated with Mentored Student Projects (MSP)

P240

<sup>1</sup>Reem Rachel Abraham, <sup>2</sup>Vasudha Devi

<sup>1</sup>Department of Physiology, <sup>2</sup>Department of Pharmacology, Melaka Manipal Medical College, Manipal Campus, Manipal University, Karnataka, India-576104

**Objective:** To determine students' perceptions regarding poster presentation associated with Mentored Student Project (MSP) at Melaka Manipal Medical College (MMMC), Manipal Campus, Manipal University, India.

**Methods:** An orientation regarding design and development of posters was given to second year MBBS students by MSP faculty coordinators. Posters which were presented by faculty coordinators in conferences were also displayed. Students were requested to indicate their responses on a five-point Likert scale, in a 10-item questionnaire.

**Results:** Analysis of results revealed a mean value greater than 3.5 for all items in the questionnaire. 'Poster presentation helped in enhancing my communication skills with my peers and teachers' was found to be scoring the highest mean (mean:  $4.2 \pm 0.96$ ). Other items which scored a mean greater than 4 included, 'presentation itself helped in demonstrating my knowledge about my work amidst an academic group' (mean:  $4.01 \pm 0.87$ ), 'getting useful feedback regarding my work' (mean:  $4.0 \pm 0.84$ ) and 'gaining confidence in presenting my work amidst an academic group in future professional meetings' (mean  $4.1 \pm 0.78$ ).

**Conclusions:** It was encouraging to observe that students benefitted from orientation as well as poster presentation itself, as evident from their feedback.

**Corresponding address:** Dr. Reem Rachel Abraham, Department of Physiology, Melaka Manipal Medical College, Manipal Campus, Manipal University, India 576 104, Email: reemabraham@yahoo.com

## ABO and secretor phenotype in H pylori infection: A Retrospective study

P241

Reema Das, Dr.(Mrs.)B.Choudhury, Dr. (Mrs.)S.Barman, Dr.(Mrs.)B.Bora

**Aim And Objective:** Hpylori is a prevalent pathogen of human and chronic infection of gastric mucosa results in gastritis, Peptic Ulcer Disease(PUD), MALT lymphoma and gastric adenocarcinoma. Epidemiological studies have demonstrated a higher frequency of blood group O and nonsecretors in PUD. Since H pylori is an established etiological factor of PUD, an association of ABO and Secretor phenotype with Hpylori was established. To evaluate the frequency of ABO and secretor phenotype in patient suffering from PUD and to crosscheck whether they were infected with H pylori.

**Materials And Methods:** A retrospective study was done in 86 PUD patients who underwent endoscopy and urea breath test for detection of H pylori, which was confirmed by PCR in biopsy samples from September 2012 to Aug 2013 in Gauhati Medical College and Hospital. ABO phenotype was determined by standard hemagglutination test and secretor phenotype was determined by hemagglutination inhibition test of saliva.

**Result:** Out of 86 patients suffering from PUD, 90.3% were blood group O and 61.62% were non secretors. Also, among 56 patients infected with H pylori, 64.2% were nonsecretors.

**Conclusion:** Result suggests that H pylori infection can be related to blood group O nonsecretors.

**Key Words:** PUD:Peptic Ulcer Disease, H pylori: Helicobacter pylori, Secretors and nonsecretors.

**Corresponding Address:** Dr.Reema Das,Post Graduate Trainee, Department of Physiology,Gauhati Medical College, Guwahati-32, Assam,Email: dr.reema12@gmail.com.

## Cardioprotective effect of bio-tea on Isoproterenol induced myocardial infarcted rats

P242

Reema Orison Lobo, Chandrakala Shenoy K.

Department of Biosciences, Mangalore University, Mangalagangothri-574199, Karnataka, India.

Despite of the advances in the treatment of coronary artery disease, acute myocardial infarction is one of the leading causes of morbidity and mortality worldwide in both men and women. Tea is a beverage that has been consumed from time immemorial for its supposed stimulating and detoxifying properties. Bio-tea (Kombucha) is prepared by the fermentation of tea by using a symbiotic association of acetic acid bacteria and yeast. The present study compares the cardioprotective effect of tea and Bio-tea in Isoproterenol (ISO)-induced myocardial infarcted rats. The pretreatment was carried out in male Albino Wistar rats for a period of 30 days followed by subcutaneous injection of Isoproterenol (85mg/kg body weight). Along with these, normal rats as well as Isoproterenol induced myocardial infarcted rats were also used which served as controls. ISO-induced rats showed a significant increase in the activities of marker enzymes such as creatine kinase, creatine kinase-MB, lactate dehydrogenase, aspartate transaminase and alanine transaminase in the serum and a subsequent decrease of the same in the heart. A marked reduction was observed in the concentration of markers enzymes in the serum with a simultaneous increase of the same in the heart tissue in rats pretreated with either tea or Bio-tea. However the present study indicated that Bio-tea possessed higher cardioprotective potential than tea.

**Keywords:** Myocardial infarction, Kombucha, Cardiac markers

**Corresponding address:** Reema Orison Lobo, Email: reema.orison@gmail.com



## Analysis of difficulty and discrimination indices in multiple True/False type of questions in an integrated system Block in MBBS programme of a Malaysian medical school

Rekha Prabhu, Girish Prabhu

School of Medicine, Taylors University, Malaysia

P243

**Objective:** To evaluate the effectiveness of the True false questions in undergraduate medical curriculum and investigate the relationship between difficulty and discrimination indices.

**Materials and methods:** The study was conducted in a medical school of Malaysia which follows an integrated curriculum with 45 medical students. The Cardiovascular system Block is held in the first year of the programme. After 5 weeks of teaching the Block with multidisciplinary subjects the assessment was held. The assessment paper consisted of 30 True false questions with 5 options for each questions. The questions were based on the topics drawn from different disciplines. The questions were constructed and vetted by the individual subject experts before being submitted to the coordinator of the block. The coordinator and other committee members made the final selection of True false questions. The True false questions were analyzed for difficulty index (p-value), discrimination index for individual and overall responses. Responses having p-value between 30-70 and  $DI \geq 0.25$  were considered average and good discrimination indices respectively.

**Results:** The mean p-value was  $67.61 \pm 22.54$  and DI was  $0.3 \pm 0.2$ . 30% of the questions (n=30) had excellent DI. About 40 % of the T/F responses in the paper were easy while about 10 % were difficult. Most of the questions with easy difficulty index had poor discrimination. Out of the 30 questions only 2 questions had negative discrimination.

**Conclusion:** TF questions which demonstrate excellent discrimination index are with average difficulty index. The effectiveness of TF type of questions needs to be evaluated.

**Corresponding address:** Dr Rekha Prabhu, School of Medicine, Taylors University No 1 JalanTaylors Subang Jaya Malaysia

## Incidence of Hospital-Acquired Anemia (HAA) in AMI patient's in-hospital and at discharge.

Rekha Sharma, R.K.Srivastava, Kuldeep Lallar<sup>1</sup>, Santprakash Kataria<sup>2</sup>

Departments of Pharmacology, Cardiology<sup>1</sup> and Clinical Pathology<sup>2</sup>, Pt. B.D.Sharma Post Graduate Institute of Medical Sciences, Rohtak. Email id: rekhasharma78@gmail.com

P244

**Introduction:** HAA is a common in patients of acute myocardial infarction hospitalized for stabilization. Drugs used for the treatment of AMI and frequent phlebotomy for investigations may contribute to HAA and unattended HAA may lead to increased mortality. Survived MI patients with HAA at discharge from hospital may lead to re-hospitalization, many complications including CHF, hypertension and death. A study was planned to look into the incidence of HAA in AMI patients during hospital stay and at discharge in our Cardiology ward, Pt. B.D.Sharma Post Graduate Institute of Medical Sciences, Rohtak.

**Methods:** We studied 20 AMI patients admitted with normal hemoglobin levels. AMI patients were given drugs to stabilize the condition and repeated phlebotomy was done for the various laboratory investigations. Measurement of hemoglobin was done to HAA i.e. mild, moderate or severe. Same procedure was followed to know hemoglobin level of AMI patients who survived at discharge.

**Results:** Mild ( $<11\text{g/dl Hb}$ ), moderate( $<9\text{g/dL Hb}$ ) and severe( $<7\text{g/dL Hb}$ ) grades of HAA developed in AMI during hospitalization. Levels of hemoglobin in mild 40% patients, moderate 20 % patients and severe 4% patients. Surviving patients from AMI had either no HAA or mild to moderate HAA at the time of discharge

**Conclusion:** Moderate to Severe HAA is associated with high risk of mortality in AMI patients. Surviving AMI patients have mild to moderate HAA at the time of discharge showing low risk of death subject to correction of anemia with improvement of hemoglobin levels.

### **Evaluation of impact of integrated teaching over didactic lecture on student learning**

**Renu Lohitashwa, Narendra S S, Mehak Mufti, Prasad B K,**

P245

**Objectives :** To assess the impact of integrated teaching method and didactic teaching method.

**Methods :** Integrated teaching method was designed by department of Physiology. A structured questionnaire on perception of teaching methodologies and active learning was obtained from 113 students. Feedback evaluation forms were compared between the two methods of teaching.

**Results:** 49% students found integrated teaching to be good when compared to 40% of didactic lecture. 47% of them found integrated teaching to be more useful and 61% of them found integrated teaching easy to understand. While 40% of them said integrated teaching made them think. Where as 40% of them opined that didactic lecture to be a part of their schedule frequently and integrated teaching to be repeated twice a year. Students realized greater command on subject and utility of course for better prospects in university exam.

**Conclusion:** The suggestions obtained from the students, if addressed effectively, can improve their learning and produce better health care professionals.

**Corresponding address:** Dr RenuLohitashwa, Assistant Professor, Dept .of Physiology, SSIMS & RC, davangere. Phone number: 9482220305 Email: renukusagur@gmail.com

### **Effect of Biomass smoke on haematological and cardiorespiratory parameters in Biomass exposed rural women**

**Revathi M, Chandrasekar M**

P246

Meenakshi Medical College and Research Institute, Enathur, Kanchipuram, Tamilnadu

**Introduction:** 80% of rural household in India still rely on unprocessed solid biomass like wood, dung for cooking and heating source. These materials when burnt inside the dwellings produce indoor air pollution.

**Aim:** The aim of this study was to evaluate the haematological and cardiorespiratory parameters of biomass fuel exposed women

**Objective:** To compare the haematological and cardiovascular parameters of biomass fuel user to that of non biomass fuel users.

**Methodology:** About 100 nonsmoking healthy women within the age of 20-40 yrs from rural kanchipuram were included in this study. 50 subjects comprised of women using biomass fuel and the remaining 50 subjects as controls. Blood samples were collected from each of the subjects for analysing haematological parameter. Blood pressure, Pulse was recorded by Digital Sphygmomanometry and Pulmonary function test was measured to assess cardiorespiratory function

**Results:** The lung function and the haematological parameters did not have any significant change, but a significant difference was found in cardiovascular function.

**Conclusion:** Biomass smoke exposure could have an adverse effect on cardiovascular functions.

**Keywords:** Pulmonary function test, Biomass fuel, cardiovascular function, haematology.

**Correspondence address:** Dr. M. Revathi, Department of Physiology, Meenakshi Medical College and Research Institute, Enathur, Kanchipuram-631552, Email: revatymk@gmail.com

## Electrophysiological changes in patients with diabetes mellitus

P247

**Risha Goswami, Geeta Baruah, Pranjal Bhuyan**

Department of Physiology, Assam Medical College & Hospitals, Dibrugarh, Assam

**Aims:** To evaluate electrophysiological changes in motor and sensory nerves in patients with diabetes mellitus

**Objectives:** 1) To determine latency, amplitude and conduction velocity in motor and sensory nerves in patients with diabetes mellitus. 2) To compare the results obtained between sensory and motor nerves

**Methods:** This hospital-based study included 40 diagnosed cases of diabetes mellitus, both males and females, with or without clinically detectable neuropathy. The parameters included latency, amplitude and conduction velocity of motor (ulnar, common peroneal) and sensory (ulnar, median) nerves. The equipment used was Neuro Perfect 4-channel EMG NCV EP.

**Results:** The most commonly affected nerves were ulnar motor and common peroneal, which were affected in all 40 patients (100%). This was followed by ulnar sensory (45%) and median sensory (25%). In case of motor nerves, mean latency was  $9.17 \pm 4.92$  ms, mean amplitude  $4.85 \pm 3.25$  mv and mean velocity  $41.83 \pm 6.90$  m/s. In sensory nerves, the parameters were  $2.48 \pm 0.73$  ms,  $29.88 \pm 12.61$  micV and  $51.37 \pm 11.63$  m/s respectively. The differences were found to be statistically significant.

**Conclusion:** The present finding of predominant motor nerve involvement in diabetics is unusual, though not uncommon, as has been observed by various authors.

**Corresponding address:** Dr. Risha Goswami, Department of Physiology, Assam Medical College & Hospitals, Dibrugarh, Assam, PIN- 786002 Email address : docrishag@gmail.com

## Effect of weight loss on vitamin D and diabetic risk factors in overweight/obese subjects

**Ritesh Kumar<sup>1</sup>, Kumar Sarvottam<sup>1</sup>, Raj Kumar Yadav<sup>1</sup>, Rajesh Khadgawat<sup>2</sup>**

P248

<sup>1</sup> Department of Physiology, All India Institute of Medical Sciences, New Delhi

<sup>2</sup> Department of Endocrinology & Metabolism, All India Institute of Medical Sciences, New Delhi

**Background and Objectives:** Vitamin D is important for glucose metabolism by regulating release of insulin, expression of insulin receptor and glucose transport in various tissues. This study was planned to assess the impact of a lifestyle intervention on vitamin D and diabetes risk factors in overweight/obese subjects.

**Methods:** The present study included 34 overweight/obese subjects with no history of DM, attending lifestyle intervention program Department of Physiology, AIIMS. The parameters were measured before and after 10 days of intervention.

**Results:** Following this intervention, there were significant improvements in weight ( $p=0.0001$ ), BMI ( $p=0.0038$ ), HR, W/H ratio, total cholesterol, LDL/HDL ratio and FBG in overweight/obese subjects. There was no significant increase in vitamin D level ( $p=0.1904$ ) but there was a trend towards improvement as observed by the change in

median value of Vitamin D. Change in Vitamin D level showed significant correlation with change in body weight, BMI, FBS & HDL ( $r=0.4774$   $p=0.0102$ ,  $r=0.4391$   $p=0.0194$ ,  $r=0.4101$   $p=0.0220$ ,  $r=0.3910$   $p=0.0438$  respectively).

**Conclusions:** These results suggest that weight reduction can modify most of the risk factors of diabetes even after a short-term intervention. The vitamin D level was relatively very low in Indians that might be improved by weight loss in overweight/obese subjects.

### **Effect of short term practice of pranayama on the cardiovascular parameters and hand grip strength in first year MBBS students**

P249

Riyanka Chail ,Asha shekar, Revathi Devi M. L.

**Aims And Objectives:**The present day stress amongst majority of the population has made yogic practices likePranayama an inevitable part of our lives. Thus , it is important to determine the effects of various types of pranayamas (involving bhastrika, ujjayi, sheetali, anuloma viloma, kapalbharathi) on blood pressure, ,cardiovascular parameters and hand grip strength.

**Materials And Methods:**The study was conducted on 30 (Males -12 , Females-18) healthy volunteers. Recordings of blood pressure, electrocardiography and handgrip strength (using hand grip dynamometer) were taken before starting pranayama and after 4 weeks of pranayama practice.

**Results:** Descriptive statistical analysis and Paired t test was done. The decrease in systolic , diastolic blood pressure and heart rate was significant ( $p=0.005$  ,  $p=0.000$  and  $0.001$  respectively). The changes in PR interval, QRS duration and corrected QT interval were not significant. However, the hand grip strength increased significantly from ( $26.1\pm7.9$ ) to ( $29.0\pm7.1$ ) i.e, ( $p=0.000$ ) in the right hand and ( $24.7\pm9.05$  to  $26.1\pm7.9$ ) in the left hand ( $p=0.000$ ) post pranayama.

**Conclusion:** Short term practice of pranayama causes significant decrease in blood pressure, heart rate and increase in hand grip strength, thus indicating the requirement to make it a day to day practice.

**Key Words:** Pranayama, Hand Grip, Blood Pressure

**Corresponding address:**Dr.Riyanka Chail (Post Graduate) Department of Physiology, Mysore Medical College and Research Institute, Irwin road, Mysore: 570001 Email: dr.riyankachail@gmail.com

### **Evaluation of hepatoprotective effect of *Aegle marmelose* in ethanol and paracetamol induced rat hepatotoxicity model.**

P250

Rojin T.S<sup>1</sup>, Sukanya Shetty<sup>2</sup>, Rajendra Holla<sup>1</sup>

<sup>1</sup>Dept of Pharmacology, KSHEMA, Karnataka; <sup>2</sup>Dept of biochemistry, KSHEMA, Karnataka

**Aim &Objectives:** To evaluate the hepatoprotective effect of the leaf extract of *Aegle marmelos* in ethanol and paracetamol induced hepatotoxicity.

**Methods:** The ethanolic extract *Aegle marmelose*(AM) studied for its hepatoprotective effect on paracetamol and alcohol induced acute liver damage on Wistar albino rats. The study was performed by administering ethanolic extract of AM prior to alcohol and paracetamol for 21 days. The degree of protection was measured by using biochemical parameters such as SGOT, SGPT,TB, GSH, SOD &GPx levels.

**Results:** Paracetamol and alcohol treated group had enhanced levels of SGPT,SGOT,total bilirubin and decreased levels of GSH, SOD and GPx when compared with control group. Treatment with silymarin and 200mg/kg AM

extract had significantly brought down the elevated levels of SGPT,SGOT,and total bilirubin and causes an increase in the levels of GSH & SOD.

**Conclusion:** From the results it can be concluded that ethanolic extract of AM possesses significant hepatoprotective activity.mn

**Corresponding address:** Mrs.Rojin T.S, Lecturer, Department of Pharmacology, K.S Hegde Medical Academy, Deralakatte, mangalore, E mail id- tsrojin@yahoo.co.in

### **To measure the effect of exercise in carbohydrate and fat oxidation in healthy normal young Indian males of age group of 18 – 30 years.**

P251

**Rose Babu, Sejil T.V, Anura V Kurpad.**

Department of Physiology, St. John's Medical College, Bangalore – 560034. Email: rosebabu515@gmail.com.

**Objectives:** To study the effects of acute exercise on fat and carbohydrate oxidation in young Indian males.

**Materials and methods:** Seven healthy normal subjects aged 18 – 30 years were recruited and underwent two indirect calorimetry runs on different days: one run being control, the other with exercise. VO<sub>2</sub>, VCO<sub>2</sub> was measured for 3 hours post exercise. Energy expenditure was calculated using Weirs formula and the non-protein RQ, fat and carbohydrate oxidation was estimated by formula described by Elia et al. The fat and carbohydrate oxidation was compared between exercise and control runs for up to 3 hours post exercise.

**Results:** The mean cumulative fat oxidation during the control run and exercise run was 14.6 ± 8.9g and 19.6 ± 4.8g, respectively which was not significantly different. The mean cumulative carbohydrate oxidation in exercise group (69.8 ± 17g) was significantly greater than control (49.7 ± 11g). There was an expected significant difference between the control and the exercise arm in energy expenditure (268.41 ± 28.98kcal vs 416.95 ± 56.13kcal) for up to 3 hours post exercise.

**Conclusion:** The data suggest that energy substrate for acute exercise is predominately carbohydrate with little or no contribution from fat oxidation.

### **Hypovitaminosis D-risk factor for endometriosis**

P252

**Rose Mary Jacob Vatakencherry<sup>(1)</sup>, Saraswathy L<sup>(1)</sup>, Radhamany K<sup>(2)</sup>, Sajitha Krishnan<sup>(3)</sup>,Dr Sundaram K R<sup>(4)</sup>**

Department of Physiology<sup>(1)</sup>, Gynaecology<sup>(2)</sup>, Biochemistry<sup>(3)</sup>,Biostatistics<sup>(4)</sup>; Amrita Institute of Medical Sciences; Kochi, Kerala

**Background:** Endometriosis is a gynaecological condition in which cells in the endometrium appear and flourish outside the cavity of uterus, mostly on the ovaries. Since Vitamin D is an immunomodulator, it may have a role in the pathogenesis of endometriosis.

**Objective:** To study the role of vitamin D as a risk factor for endometriosis.

**Materials And Methods:** Sixty women with endometriosis and sixty women without endometriosis(age group-20 to 40 years)attending Gynaecology Out patient department of Amrita Institute of Medical Sciences; Kochi from October 2012 to March 2013 were enrolled in the cross-sectional study. Serum levels of 25 Hydroxy vitamin D were assessed.

**Results:** Sixty women with endometriosis and sixty women without endometriosis were recruited. Mean (±S.D) levels of 25 Hydroxy vitamin D in women with and without endometriosis were 9.1±3.97ng/ml and 20.51±6.59ng/

ml respectively ( $p$  value =  $<0.001$ ). Statistically significant lower levels of Vitamin D was observed in women with endometriosis.

**Conclusion:** Women with endometriosis are found to have lower levels of Vitamin D when compared to women without endometriosis.

**Corresponding Address:** Dr Saraswathy L, Professor and H.O.D-Department of Physiology, Amrita Institute of Medical Sciences, Kochi, Kerala; E-mail id-saraswathy@aims.amrita.edu

### Changes in evoked potentials (VEP,BAER) in follicular and luteal phases of menstrual cycle

Roseline Jesintha.V, Bhuvanewari.S Neelambikai.N

P253

Department of Physiology, Coimbatore Medical College, CBE-14.

**Background:** Evoked potentials are the convenient and non-invasive tools for assessing the integrity of central nervous system. Apart from age and gender these evoked potentials (VEP,BAER) also influenced by the varying levels of ovarian hormones in the different phases of menstrual cycle.

**Aim of the study:** To observe the changes of brainstem auditory evoked response and Visual evoked potentials in the Follicular Phase and Luteal Phase of the menstrual cycle in healthy young women.

**Materials & Methods:** Study group of thirty females between the age of 18 to 25 years having regular menstrual cycles of 28 days were included in the study. The females with irregular menstrual cycles, PCOD, subjective hearing loss, Refractive error and who were on hormonal pills were excluded from the study.

**Methodology:** BAER and VEP were recorded by using Neuroperfect EMG 2000 system with installed software during follicular (8 – 14) & luteal phases (17-23) of the same menstrual cycle. In BAER, absolute latencies of waves I, III & V and interpeak latencies of waves I – V, I – III & III – V were recorded. In pattern reversal VEP, peak P100, N75 and N145 latencies were recorded.

**Results:** Statistical analysis were done by using Unpaired 't' test. There were increase in absolute latencies and inter peak latencies of BAER in the follicular phase compared to the luteal phase, and it was statistically significant ( $p < 0.05$ ). Likewise, latencies of N75, P100 waves of VEP were significantly prolonged ( $p < 0.05$ ) in follicular phase.

**Discussion:** The increased wave latencies during follicular phase may be due to elevated levels of Estrogen, which is said to enhance the release of neurotransmitter GABA which slows down the synaptic conduction time. The decreased wave latency in the luteal phase may be due to thermogenic and antagonistic action of progesterone.

**Conclusion:** From this study it was found that the neuronal conduction in the auditory and optic pathway was modulated by the fluctuating levels of Estrogen and Progesterone in the follicular and luteal phases of menstrual cycle.

### Effect of treadmill exercise on lung function in obese male students

Rucha Wagh, Dalia Biswas, V K Deshpande

P254

Dept. of Physiology, Jawaharlal Nehru Medical College, DMIMS(DU), Sawangi(M), Wardha, Maharashtra

**Introduction:** Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems.<sup>(1,2)</sup> People are considered obese when their body mass index (BMI), a measurement obtained by dividing a person's weight in kilograms by the square of the person's height in metres, exceeds  $30 \text{ kg/m}^2$  <sup>(1)</sup> In the United States obesity is estimated to cause 111,909 to 365,000 deaths per year, <sup>(2,3)</sup> while 1 million (7.7%) of deaths in Europe are

attributed to excess weight.<sup>(4,5)</sup>In healthy teenagers, obesity and physical inactivity are the two main factors that affect the respiratory functions. Regular and periodic exercise is the best exercise to reduce the BMI which helps in improving the respiratory indices by strengthening the respiratory muscles.

**Aim:** To study the effect of exercise on lung function in obese male students.

**Objective:** 1) To study the effect of aerobic exercise on the obese subjects. 2) To study the changes in FVC and FEV<sub>1</sub> after treadmill exercise intervention.

**Material And Method:** 30 obese male students of MBBS 1<sup>st</sup> year, Jawaharlal Nehru Medical College, DMIMS(DU), Sawangi (M), Wardha were randomly selected, their baseline parameters like age, height, weight, BMI were recorded pre and post intervention while pulmonary functions with Medspiror (Helios)<sup>(6)</sup> were recorded. Then they were given Treadmill exercise as intervention on motorized treadmill (RMS)<sup>(7,8)</sup> (AMBALA) for 30min (5days/week/month) in the exercise Physiology Lab, JNMC, DMIMS(DU), Sawangi(M), Wardha under professionally trained personnel for 1 month. After 1 month of treadmill exercise post exercise parameters were again evaluated to observe their ventilatory changes.

**Result:** Thirty obese male students of age group 19-20 (mean±SD=19.53±0.50). A subject with a body mass index (BMI) in the 95th percentile or greater are considered to be obese. Their BMI is compared with the pre and post intervention recordings. But there is no statistically significant difference for post test values in the study group regarding the pre study measured age and BMI variable. Whereas, results show that there is significant difference in the study group with their pre and post recordings after treatment in FVC, FEV<sub>1</sub> values, which show a significant difference (p-value ≤ 0.05) is observed in the study group. Also the results show that there is significant difference between pre and post study group after intervention, in FEV<sub>1</sub>/FVC values, which show a significant difference (p-value ≤ 0.05).

**Conclusion:** In obese teenagers, appropriate and regular aerobic exercise training can partly improve lung function by strengthening the muscles of respiration.

### **Assessment of otolith function by comparing click-short tone bursts induced vestibular evoked myogenic potential in migraine with/without vertigo patients and age-sex matched controls.**

P255

**S.Anbuselvi Mattuvar Kuzhali, B.Vishwanatha Rao\***

Assistant Professor of Physiology, Stanley medical college, Chennai.

**Background:** Vestibular evoked myogenic potential, an otolith mediated short latency evoked potential recorded from tonically contracted sternocleidomastoid muscle in response to intense auditory click delivered via headphones. It has been accepted as a reliable method of assessing otolith function. The study has its limitation as not much work has been done in the Indian sub-continent to compare the data.

**AIM:** To compare the difference in latencies and amplitude of VEMP between migraine patients with/without vertigo and age/sex matched controls.

**Materials and Method:** 60 migraine patients with/without vertigo were selected from the migraine OPD, Institute of neurology and compared with age/sex matched controls. After Written Informed Consent all subjects underwent clinical examination, audiometry and VEMP testing (RMS multichannel polyrite). Auditory click stimulus with an intensity of 100dB aHL, 500Hz presented via headphone at a stimulation rate of 5/sec averaged for 200 presentations. The VEMP waveforms p13, n23 latency and p13-n23 (μV) amplitude were recorded from tonically contracted sternocleidomastoid muscle. The averaged waveforms of VEMP were evaluated using SPSS-15.

**Results:** Unpaired students 't' test used to compare the waveforms of VEMP between the controls and the migraine patients. A highly significant decrease in p13-n23 ( $\mu\text{V}$ ) amplitude was found between the migraine patients with/without vertigo and the controls ( $p < 0.001$ ) both during binaural/monaural stimulation ( $p < 0.00001$ ). The interamplitude difference ratio was high in the migraine patients with/without vertigo than that of controls ( $p > 0.05$ ). No statistically significant difference in p13, n23 latencies was observed.

**Conclusion:** The amplitude of VEMP in migraine patients was significantly lower compared to that of controls probably due to the habituation deficit in cortical evoked potential which might be associated with hypofunction of subcortical serotonergic input to vestibular nucleus.

**Corresponding address:** S. Anbuselvi Mattuvar Kuzhali, Stanley medical college, Chennai - 1. Email id: vishwanathrao54@gmail.com

## **Effect of *Gymnema Sylvestre* in noise stress induced changes in rat brain neurotransmitters**

**S. Malathi and R.Ravindran**

P256

Department of Physiology, Dr.ALM PG IBMS, University of Madras, Chennai

**Introduction:** Stress is nothing but brain and body reaction towards stimuli arising from the environment or from internal cues that are interpreted as a disruption of homeostasis. The organization of the response to a stressful situation involves not only the activity of different types of neurotransmitter systems in several discrete areas of the brain, but also the response of neurons in these areas to several other chemicals and hormones released from peripheral organs and glands. In this study we will review the responses to noise stress in terms of neurotransmitters release in areas of the brain involved in the regulation of stress responses.

**Objective:** To evaluate adaptogenic activity of methanol extract of *Gymnema sylvestre* leaves against noise stress induced animals and to study whether this herb can prevent the deleterious effect of noise stress induced neurotransmitter release in male Wistar albino rats

**Methodology:** All the group animals will be pre-treated with herb. Acute noise stress Group: Neurotransmitters level, membrane bound enzymes and anti-oxidant activity will be measured along with mRNA expression of hsp-70 and c-fos. The same protocol will be followed for chronic noise stress group after a month.

**Results:** study to be carried out

**Conclusion:** Stress has become an integral part of human life in this modern era. A large number of people are exposed to potentially hazardous noise levels in daily modern life. Several medicinal plants in Ayurveda have adaptogenic activity and thereby it protects the brain from stressful environment. So our study will help to understand the adaptogenic activity of *Gymnema sylvestre* and alterations in neurotransmitters release and how this can be modified through different stressful conditions.

**Corresponding Address:** S. Malathi, Department of Physiology, Dr.ALM PG IBMS, University of Madras, Chennai-113.



## A pilot study to compare pulmonary function test of rice mill workers and tamarind seed powder mill workers with unexposed population

P257

S.Parasuraman ; Vinutha Shankar MS

Department of Physiology ,Sri Devaraj Urs Medical College,Tamaka- KOLAR.

**Background:** Rice mill industry workers are exposed to lot of dust. Dust particles smaller than 10  $\mu$  is considered as respirable dust, can cause serious degradation of respiratory. Another small scale industry present in villages is tamarind seed powder mill and these workers too are exposed to tamarind seed dust.

**Objective:**(1) To compare the pulmonary functions in rice mill workers and unexposed population; (2) To compare the pulmonary functions in tamarind seed powder mill workers and unexposed population. (3) To compare the pulmonary functions of exposed rice mill workers and tamarind seed powder mill workers.

**Materials and methods:** Relevant history was taken from **60** subjects [**20-rice mill workers, 20-tamarind seed powder mill workers 20- unexposed** subjects].pulmonary function test was recorded using **RMS-PFT machine [MEDSPIROR]**.ANOVA and post hoc tests were **applied** to compare the means between the exposed and unexposed was applied.

**Results:** PFT parameters reductions is seen in rice mill workers when compared to tamarind seed powder mill workers and controls which was statistically significant.

**Conclusion:** Respiratory impairment were more significantly increased in rice mill workers than tamarind seed mill workers.

## Activity dependent maturation of visual Wulst following prenatal repetitive auditory stimulation at a critical developmental period in domestic chicks (*Gallus domesticus*)

P258

Saborni Roy<sup>1</sup>, Tapas C. Nag<sup>2</sup>, Rashmi Mathur<sup>1</sup>, Suman Jain<sup>1\*</sup>

<sup>1</sup>Department of Physiology, All India Institute of Medical Sciences, New Delhi, India.<sup>2</sup>Department of Anatomy, All India Institute of Medical Sciences, New Delhi, India

**Aims and objectives:** The developing visual circuitry attains its mature pattern through the process of activity-dependent refinement in which light stimulation plays the major role. Apart from light, auditory stimulation also found to facilitate the development of the visual system if provided during a critical period. This study explores the mechanism underlying the remodeling of visual system development following prenatal auditory stimulation.

**Method:** Fertilized eggs of chickens, during incubation, were exposed to either species-specific calls or no sound. The factor mediating the activity dependent cortical maturation e.g. brain derived neurotrophic factor (BDNF), was estimated at E19, E20, and PH1-3; whereas neurotransmitters i.e. GABA, glutamate, norepinephrine and serotonin were estimated at E10, 12, 14, 16, 18 and 20 in the auditory cortex and in both hemispheres of the visual Wulst.

**Result:** In the auditory cortex, increased expression of BDNF was observed in all stimulated groups whereas in visual Wulst, BDNF increased only in those groups which received stimulation during the functional maturation of the visual system. A similar pattern was observed in all the neurotransmitters. Significant inter-hemispheric differences were observed in BDNF expression and neurotransmitters, in all groups.

**Conclusion:** These results suggest the role of BDNF in the activity driven structural maturation of visual system, following prenatal repetitive auditory stimulation. (Words: 203)

**Corresponding address:** Dr. Suman Jain, Ph.D. Additional Professor, Department of Physiology, All India Institute of Medical Sciences, Ansari Nagar, New Delhi 110029, India. Email- sumanjain10@gmail.com,

## **Effect of a yoga and a walking program on adipokines in the obese: a randomized controlled trial**

P259

**Sachin Kr. Sharma, Shirley Telles, Arti Yadav, Acharya Balkrishna**

Patanjali Research Foundation, Haridwar, India.

Email: sharmasachin.sharma25@gmail.com(www.patanjaliresearchfoundation.com)

**Aims and objectives:** The study compared the effects of a residential supervised yoga program with a supervised walking program on adipokine levels (leptin and adiponectin) in obese persons.

**Method:** Twenty-six obese participants of both sexes (22 male), age range from 21 to 52 years group mean $\pm$ S.D., 33.3 $\pm$ 9.9 years were selected for the study based on their BMI  $\geq$ 25 kg/m<sup>2</sup>. The participants were randomized as two groups (yoga and walking). All participants were assessed for serum leptin and adiponectin following a 12-hour fast at the beginning and at the end of the fifteen day intervention. The yoga group practiced supervised yoga for forty-five minutes twice in a day for fifteen days. At the same time of the day the walking group practiced forty five minutes of supervised walking. Each day participants were given a non calorie restricted diet regulated as 1800 kcal/day. Data recorded at the beginning and at the end of the intervention were compared by Repeated Measures Analysis of Variance using SPSS Version 18.0, followed by *post-hoc* analysis.

**Results:** The Yoga group showed a significant increase ( $p < 0.01$ ) in leptin levels. The walking group alone showed a significant reduction ( $p < 0.05$ ) in adiponectin levels.

**Conclusion:** Both interventions had an opposite effect on two adipokines; leptin and adiponectin, suggesting important differences in the two interventions.

**\*Cut-off for an Indian population**

## **The study of diagnostic efficacy of f-wave in cervical radiculopathy**

P260

**Sachin Pawar, Aditi Kashikar, Ar Chaudhari**

Department of Physiology, Mahatma Gandhi Institute Of Medical Sciences, Sevagram

**Objective:** Cervical radiculopathy (CR) is a neurologic condition characterized by dysfunction of cervical spinal nerve, roots of the nerve, or both. No universally accepted criteria for its diagnosis have been established. Clinical examination, radiological imaging and electrophysiologic evaluation are the different modalities to diagnose CR. The incidence of this ailment is increasing in present scenario and the use of radiologic examination is time consuming and uneconomical for the common Indian setup. Thus, there is a definite need to establish cost effective, reliable, and accurate means for establishing the diagnosis of cervical radiculopathy. Electro-diagnostic tests are the closest to fulfill these criteria.

**Aim:** To evaluate diagnostic utility of F-wave in cervical radiculopathy.

**Methods:** Cross-sectional study was conducted on 100 subjects aged 40 years and above. The consecutive patients clinically diagnosed to have cervical radiculopathy were prospectively recruited for the nerve conduction study using RMS EMG EP Mark-II.

**Results:** F-minimum latency was found to have highest sensitivity (82.05%) and positive predictive value (68.09%) among all nerve conduction parameters.

**Conclusion:** The findings reflect that late response studies are useful supportive diagnostic tool for suspected cervical radiculopathy as they are found to have reliable sensitivity and specificity.

**Corresponding address:** Dr Sachin Pawar, Assistant Professor, Department of Physiology, MGIMS, Sevagram (M.S.) **E-mail:** drsachinpawar78@gmail.com

## Lipid profile in coronary artery disease patients of age between 30 and 55

P261

**Sameer Rajaram Dhanumali**

**Aim:** to evaluate most significant lipid profile test in coronary artery disease patients

**Objective:** To compare difference in lipid profile tests in cad patients

**Methods:** 67 patients from cardiology department were recruited in study. They underwent catheter angiography. Out of 67 patients 47 advised angioplasty or bypass surgery grouped as GP 2. Remaining 20 patients were found to have normal angiography or advised medical management grouped as GP1. Triglyceride, total cholesterol, HDL, LDL, VLDL, Triglyceride/HDL ratio tests were performed for these patients. Lipid profiles of these two groups compared using unpaired t test.

**Result:** Group 2 showed significantly higher values for triglyceride (GP2 mean 202 SD +/-87.79 gp1 mean 131.75 SD +/-43.19 p=0.0012), triglyceride /HDL ratio (GP2 mean 5.57 SD +/-1.98 GP1 mean 3.66 SD +/-1.07 p=0.0001) than group 1. But there is no statistically significant difference for total cholesterol (GP2 Mean 167 SD +/-41.33 gp1 mean 157 SD +/-34.69 p=0.346), HDL (GP2 mean 36.46 sd +/-7.17 GP1 mean sd 36 +/-7.33 p=0.8121) values.

**Conclusion:** Triglyceride, Triglyceride/ HDL ratio are more reliable tests than total cholesterol, HDL in coronary artery disease patients.

**Corresponding address** -Dr. Sameer R. Dhanumali, Department of physiology, 3<sup>rd</sup> floor, college building, lokmanya tilak medical college and hospital, Sion, mumbai-400022, EMAIL- srddhanumali@hotmail.com / physiology@ltmgh.com

## Evaluation of cardiovascular parasympathetic activity in between 1<sup>st</sup> and 2<sup>nd</sup> trimesters of pregnancy

P262

**Sandeep H. Ghuge, Adgaonkar BD, Patil KB, Latti RG, Thorat KD, Vinod PT**

MIMSR Medical College, Latur (M.S.)

**Background:** Pregnancy is associated with substantial changes in cardiovascular system. It might be anticipated that baroreflex function would be decreased in pregnancy because of the physiologic hypervolemia of pregnancy. So the present study was planned, to investigate the sequential changes in cardiovascular parasympathetic activity in between 1<sup>st</sup> & 2<sup>nd</sup> trimesters of pregnancy.

**Aim:** To Assess and Compare Cardiovascular parasympathetic activity in between 1<sup>st</sup> & 2<sup>nd</sup> Trimesters of Pregnancy.

**Objectives:** To study and compare effect of pregnancy on cardiovascular parasympathetic activity. (1) To establish the relation between pregnancy and cardiovascular parasympathetic activity.

**Material and Methods:** Pregnant women between age of 18 to 28 years visiting for ANC clinic in the hospital were considered for study and grouped as- GROUP I - 1<sup>st</sup> TRIMESTER (30 cases); GROUP II- 2<sup>nd</sup> TRIMESTER (30 cases). The duration of study- September 2011 to August 2012. Pregnant women with H/O chronic major illness and addiction were excluded. All subjects were evaluated by “CANWIN- Cardiac Autonomic Neuropathy Analyzer”, using the tests like Resting heart rate/min, Heart rate response to deep breathing, Heart rate response to standing and Heart rate response to Valsalva maneuver.

**Results:** Women in group I showed normal parasympathetic activity plus mildly decreased parasympathetic activity. Almost all the women in group II showed mildly decreased parasympathetic activity.

**Conclusion:** In both groups the parasympathetic activity was affected. Cardiovascular parasympathetic activity declines from the first trimesters of pregnancy and more decline in 2<sup>nd</sup> trimesters of pregnancy.

## **Inroads into the realm of sports physiology - approaching hypertension in athletes**

**Sandeep.G , Semmal.M**

P263

Department of Physiology, Sri Ramachandra University, Porur, Chennai.

Hypertension (HTN) is the most common cardiovascular condition prevalent among athletes as evidenced during screening tests for athletes. Almost 80 percent of adolescent athletes with an elevated blood pressure (BP) would eventually develop sustained HTN, so BP should be closely monitored irrespective of the level of physical fitness.

Respiratory and heart rate, venous return increases with aerobic exercises, whereas peripheral vascular resistance and left ventricular after load increases with resistance exercises. BP is affected by chronic effects on autonomic control mechanisms and vascular re-modeling by exercise training. Progressive aerobic exercise training increases cardio respiratory fitness, during sustained physical activity. Family history of HTN and premature CV diseases, high intake of sodium, saturated fats, alcohol, stimulants and cocaine, tobacco, human growth hormone, anabolic steroids - all will lead to HTN.

Standard guidelines suggest recording the BP twice during each visit and once at least a week later if the initial values are elevated. In an elevated BP, a fundoscopic examination, thyroid gland palpation, cardiac auscultation, and abdominal auscultation for renal bruits are indicated. Blood chemistries and lipid profile, hematocrit, urinalysis, and electrocardiogram are also indicated. Athletes must be periodically monitored as they have unique physiologic and psychological attributes, as the goal of health care providers is to keep athletes as active as possible.

## **Effects of deep breathing for short duration on Pulmonary Functions in healthy young volunteers.**

**Sandip R. Sardesai, Dr. Sanjay S. Pandarbale & Dr. J. R. Pednekar.**

P264

Department of Physiology, Goa Medical College, Bambolim, Goa. 403202

200 Young healthy volunteers in age group of 18 to 22 years were taken for this study. They were explained the procedure. Guidelines laid down by college ethical committee were strictly followed.

After 5 minutes rest their following lung parameters were recorded: (1) Tidal volume

(2) Respiratory rate (3) Respiratory Minute volume (4) Vital capacity (5) Peak expiratory flow rate and (6) Breath holding time (at the end of deep inspiration). Three reading of each parameter (except respiratory rate) were taken and the best of the three readings were recorded. Then the readings were converted to BTSPS by multiplying

by conversion factor according to room temperature. Then the subjects were asked to do deep breathing for 2 minutes (6 times per minute). After a rest of 5 minutes all above lung function parameters were recorded. Then deep breathing was done for 5 minutes (6 times per minute) and after a rest of 5 minutes all above lung function parameters were recorded.

It was observed that after deep breathing of 2 minutes all the above lung function parameters were increased. However increase was not statistically significant. After deep breathing for 5 minutes there was significant increase in vital capacity, peak expiratory flow rate and breath holding time, while there was non-significant increase in tidal volume and respiratory rate. Thus we can conclude that deep breathing improved lung function parameters.

**Corresponding Author:** Dr. Sandip R. Sardessai, Professor in Physiology, Goa Medical College, Bambolim, Goa. 403202; **Email:** sandip.sardessai@yahoo.com

## Critical appraisal of drug promotional literatures

P265

**Sangita G. Kamath, Usha Rani D., Varun H.V., Harsha K.P., Umakant N. Patil**

Department of pharmacology, SSIMS & RC, Davanagere

**Aims & Objectives:** To analyze drug promotional literatures for authenticity and validity of the information using World Health Organization (WHO) criteria for ethical medicinal drug promotion.

**Materials and Methods:** 500 drug promotional literatures were collected from the out-patient departments of SSIMS & RC and hospital, Davanagere and only 206 fulfilling the inclusion and exclusion criteria were evaluated using WHO criteria. A pro-forma was used to cross verify the scientific authenticity of the information provided in them.

**Results:** All 206 drug promotional literatures had mentioned generic name except one. 175(84.95%) drug promotional literatures had preparations approved by regulatory authorities. 177(85.92%), 88(42.72%), 78(37.86%) of them mentioned dosage form, dosage regimen and route of administration respectively. 188(91.26%) mentioned therapeutic uses but only 30(14.36%) mentioned side effects, warning and precautions, contraindications, major interactions. 158(76.70%) had quoted references for information provided, 191(92.72%) had claims, 55(26.70%) had individual data presentations and 41(19.9%) gave abridged prescribing information.

**Conclusions:** WHO guidelines were not followed completely by any of the drug promotional literatures. Majority of them gave importance to therapeutic uses over other parameters. Only salient features were highlighted in order to market their products for commercial gains rather than giving complete and necessary scientific information to prescribing doctors.

**Keywords:** Drug promotional literature; WHO criteria; ethical medicinal drug promotion.

**Corresponding address:** Dr. Sangita G. Kamath, Post graduate student, Department of pharmacology, SSIMS & RC, Davanagere – 5. Email ID: sangu.kamath@gmail.com Ph No: 9945284030

## Knowledge and awareness regarding oral contraceptives usage among housewives in Haryana state in Northern India.

P266

Sangwan P., Kaushal J., Godara S., Gupta M.C.

Department of Pharmacology; Pt.B.D.Sharma, Post Graduate Institute of Medical Sciences Rohtak, India.

**Objectives:** To find out the knowledge, awareness and usage of oral contraceptives (OCPs) among the housewives in Haryana.

**Methods:** A detailed questionnaire was designed to assess the pattern of oral contraceptives usage, awareness of benefits and side effects. One hundred housewives were interviewed in Rohtak city of Haryana. A house to house survey was done and the pre-designed questionnaire was filled.

**Results:** The women who were taking oral contraceptives were in the age group ranging between 25-35 years. Use of OCPs was highest among women with two children and of middle income group. Most of the women got motivated from doctors regarding the use of OCPs. Only 5% of the women were aware of the additional benefits of OCPs (e.g. regularization of menstrual cycle and relief from dysmenorrhoea). 25% of the women experienced spotting during the usage and 7% experienced episodes of heavy bleeding. In all, 48% of users missed one pill per cycle, and 24% missed two or more. The women who were educated and thus could understand the instructions properly, those who got husband's support complied better, had less incidence of missing pills, were more satisfied with this method of contraception.

**Conclusion:** The study concludes that there is lack of adequate knowledge and awareness amongst women regarding the use of OCPs. Proper education, husband's support and motivation by health personnel can improve the compliance regarding the use of OCPs.

**Corresponding address:** Sangwan P., Department of Pharmacology; Pt.B.D.Sharma, Post Graduate Institute of Medical Sciences Rohtak, India; E-mail ID: priyanka.sangwan.2004@gmail.com

## Association between body mass index (BMI), body fat percentage and pulmonary functions in underweight, overweight and normal weight adolescents

P267

<sup>1</sup>Sanhita Mukherjee, <sup>2</sup>Diptakanti Mukhopadhyay, <sup>1</sup>Gautam Chatterjee

<sup>1</sup>Dept of Physiology, B.S. Medical College, Bankura; <sup>2</sup>Dept of Community Medicine, BSMC, Bankura

**Aims & Objectives:** The aim of the study was to find out whether there was any correlation between the Body Mass Index, Body Fat percentage and FVC, FEV<sub>1</sub> and FEF<sub>25-75</sub> in underweight, normal weight and overweight adolescents.

**Methods:** 100 students consisting of 50 boys and 50 girls in the age group of 18 to 21 years were included in the study. They were classified into underweight, normal weight and overweight groups according to WHO guidelines. The body fat percentage was measured by using Harpenden skin fold caliper and FVC, FEV<sub>1</sub> and FEF<sub>25-75</sub> were assessed by using RMS Helios 702 electronic spirometer.

**Results:** The FEF<sub>25-75</sub> values were low in the overweight than in the normal weight subjects. FVC, FEV<sub>1</sub> and FEF<sub>25-75</sub> had a negative correlation with BMI and the body fat Percentage in males. The underweight males had a positive significant correlation between BMI, body fat percentage and FVC, FEV<sub>1</sub> and FEF<sub>25-75</sub>. In females, only FEF<sub>25-75</sub> had a significant correlation with BMI and the body fat percentage.

**Conclusion:** There was a significant difference in the FVC, FEV<sub>1</sub> and the FEF<sub>25-75</sub> values between the underweight, normal weight and the overweight subjects. Body fat percentage had a stronger correlation than BMI.

**Corresponding address:** Dr. Sanhita Mukherjee, Assistant Professor, Physiology, BSMC, Bankura, 14 B, A.B.C Lane, Uttarpara, Hooghly, West Bengal, 712258, e-mail: drsanhita@gmail.com

## **A study of effect of yoga on symptoms and drug use in patients with bronchial asthma**

Sanjeev Satpathy, Aiswarya Kar, Arpita Priyadarsini

P268

**Objective:** Bronchial asthma is one of the most common chronic diseases in the world. Pharmaceutical interventions like using inhalational bronchodilators ( Short Acting  $\beta_2$  Agonist-SABA) and corticosteroids(ICS) has grown like anything. These have a multisystem deleterious effect. Yogic exercise has been used to treat patient with asthma for over 50 years. The present study was an attempt to include yogic exercise into treatment modality of asthmatic patients and compare the changes in their symptoms, mainly the acute exacerbation and dyspnoea.

**Methods:** 71 patients with bronchial asthma taken and were randomized into two groups, Group A (Yoga Group) and Group B (Control Group). Group A contained 37 subjects and Group B contained 34. Both the groups were under routine therapy. The subjects of Group A were asked to perform yoga for 4 months and were given charts and scales to monitor the number of acute exacerbations, dyspnoea grade, asthma symptom score and drug frequency. The yoga performed were Tadasana, Simhagarjanasana, Kastatakshyanasana and Bhastrika pranayama. The parameters were compared by using Chi-Square test. Statistical analysis was done using SPSS 16.0 software.

**Result:** After 4 months of study, majority of patients in Group A showed significant decrease in dyspnoea grade, Asthma Symptom Score, acute exacerbation and use of drugs.

**Conclusion:** The yoga breathing exercise used in addition with standard drugs significantly improved the symptoms of asthma, giving the patients a better quality of life. It also decreased the use of drugs, thus protecting the individuals from their hazardous effect.

**Corresponding address:** DR.Sanjeev Satpathy, Plot-602, AT- Mahanadi Vihar, PO-Naya Bazar, Cuttack, Odisha,PIN-753004.NO- 9438407655 E-MAIL: drsanjeev.odisha@gmail.com

## **Cold pressor test unmasks differential reactivity of the heart and the blood vessels in patients of Multiple System Atrophy with Parkinsonism.**

Sankanika Roy<sup>1</sup>, Ashok K. Jaryal<sup>1</sup>, Achal K. Srivastava<sup>2</sup>, Kishore K. Deepak<sup>1</sup>

P269

1.Department of physiology, AIIMS, New Delhi, India. 2) Department of neurology, AIIMS, New Delhi, India

**Objective:** Multiple System Atrophy-Parkinsonian variant (MSA-P) shows features of both Parkinsonism and dysautonomia where orthostatic hypotension (OH) is a common manifestation. The mechanism of OH in MSA-P is proposed to be due to central lesions only. We hypothesized that the baroreflex independent sympathetic reactivity may also be compromised in these patients. To evaluate this we assessed the sympathetic vascular reactivity and the heart rate change to standard cold pressor test (CPT) in these patients.

**Methods:** Data was recorded in 20 patients of MSA-P. ECG and PPG (photoplethysmography) signals were continuously acquired during a baseline period (1 min) and during 10 degree C cold exposure (1 min) of the contralateral hand. The change in heart rate was evaluated from the ECG record. The vascular response was evaluated by measuring the pulse transit time (PTT) of the finger (PPG) waveform.

**Results:** The peak heart rate increased significantly in patients of MSA-P as a response to the cold pressor test ( $5.757 \pm 0.7760$  bpm,  $p < 0.0001$ ) but there was no change in the PTT ( $0.1292$  ms  $\pm 2.67$ ,  $p=0.859$ ).

**Conclusion:** The study shows that there is differential regulation of the heart and the blood vessels during a cold pressor test with intact heart rate response but compromised vascular reactivity.

**Corresponding address:** Kishore K. Deepak, Department of physiology, AIIMS, New Delhi, India. Email: [kkdeepak@gmail.com](mailto:kkdeepak@gmail.com), phone number - 0091-11-2659 3583

## **A comparative study of left ventricular diastolic function in young pre-hypertensives and normotensives by Doppler echocardiography**

Santha kumari S.P, Madan Mohan

P270

**Aim and Objectives:** The structural and functional alteration of the heart caused by pre-hypertension is unclear. The present study was designed to compare the left ventricular diastolic function in young normotensive and pre-hypertensive subjects between the age group of 18–35 years using transmitral Doppler echocardiography.

**Subjects and methods:** Pulse wave transmitral Doppler echocardiographic data was assessed in 100 subjects. Of which, 50 were normotensives (systolic  $<120$  mmHg and diastolic  $<80$  mmHg) and 50 were pre-hypertensives (systolic =  $120$ – $139$  mmHg and diastolic =  $80$ – $89$  mmHg). Their early and late diastolic peak transmitral flow velocity ratio (E/A ratio) and deceleration time (E wave deceleration time) were measured. Un-paired student's t-test was used for statistical analysis.

**Results:** When compared with normotensive, in the pre-hypertensive group the E/A ratio was significantly decreased ( $p=0.05$ ) and the deceleration time (DT) was significantly prolonged

( $p = 0.01$ ).

**Conclusion:** This study concludes that diastolic relaxation abnormalities starts even in young prehypertensive individuals. The changes in the indices of diastolic function were only subtle in this age group of prehypertensives. Pre-hypertension is a predictor of established hypertension and diastolic dysfunction.

**Corresponding address:** Dr. S.P. Santha kumara, D/O Paramanathan S., No: 7, 6<sup>th</sup> cross, Chella pappu nagar, Reddiarpalyam, Puducherry- 605010, Mobile No: 09789880020. Email I.D : [shanthakumari1212@gmail.com](mailto:shanthakumari1212@gmail.com)

## **Effect of Orexin a micro-infusion into basolateral amygdala on consummatory behaviour in wistar rats.**

Santosh Mayannavar, Rashmi KS, Keerthi Deshpande, Ganaraja B.

P271

Department of Physiology, KMC., Mangalore (A unit of Manipal University) INDIA. Email: [mayannavarsantosh@gmail.com](mailto:mayannavarsantosh@gmail.com)

**Aims:** Role of Orexin A in Basolateral amygdala on consummatory behaviour.

**Objectives:** To study the effect of orexin A on alcohol intake and consummatory behaviour in Basolateral amygdala.

**Methods:** Male Wistar albino rats weighing about  $250 \pm 10$  grams ( $n=36$ ) were divided into subgroups. Cannula was implanted in BLA for infusion of drug. After the recovery period, Orexin A (3 nano mol) was infused in intervention group and saline in control group. Food, water and alcohol (10%) intake in 1<sup>st</sup> hr, 2<sup>nd</sup> hr, 4<sup>th</sup> hr and 24 hour were noted down.



**Results:** Orexin A infused rats, showed increase in food ( $p \leq 0.001$ ), water ( $p \leq 0.05$ ) and 10% alcohol ( $p \leq 0.05$ ), short period (0-1hr) of time compared to control group of rats. In alcohol consuming rats, there was increase in food intake ( $p \leq 0.01$ ) during 2<sup>nd</sup> hr. Subsequent period of time there was no increase in consumption. In two bottle choice between water and alcohol, the rats preferred to accept water.

**Conclusion:** Orexin A stimulates food, water and 10% alcohol, short period (0-1hr) of time compared to control group of rats. Orexin A into BLA doesn't appear to have role in alcohol preference.

**Key words:** Orexin A, Food intake, water intake, alcohol intake, Basolateral amygdala.

## Raman spectroscopical analysis of erythrocytes from hyperbilirubinemic blood samples.

<sup>1</sup>Sanu Susan Jacob, <sup>2</sup>Aseefhali Bankapur, <sup>2</sup>Surekha Barkur, <sup>3</sup>Pragna Rao, <sup>2</sup>Santhosh Chidangil

P272

<sup>1</sup>Department of Physiology, Kasturba Medical College, Manipal University, <sup>2</sup>Department of Atomic and Molecular Physics, Manipal University, <sup>3</sup>Department of Biochemistry, Kasturba Medical College, Manipal University.

*Corresponding Author* Sanu Susan Jacob, Faculty of Physiology, Department of Physiology, Kasturba Medical College, Manipal University, Manipal, Karnataka, 576 104 Fax No: +91-820-2571927 E.mail :sanu.susan@manipal.edu

**Objectives:** To investigate the Raman spectra of single, live erythrocytes obtained from blood samples with elevated total bilirubin and to compare them with that of single, live erythrocytes from healthy volunteers.

**Materials and Methods:** Erythrocytes from healthy volunteers (n=2) with total serum bilirubin 0.5-1mg/dl and from jaundiced patients (n=19) with total bilirubin ranging from 7- 35 mg/dl were extracted. With the Raman tweezers set-up, red cells were optically immobilized and probed using 785nm Diode laser. An excitation power of 10mW was used. 126 Raman spectra were obtained from red cells of hyperbilirubinemic samples and 20 from red cells of healthy blood samples.

**Results:** The Raman spectra of red cells from hyperbilirubinemic samples showed an increase in intensity at the pyrrole region compared to those obtained from red cells of healthy blood samples

**Conclusions:** These results suggest a possible increase in exposure of the pyrrole-structure of the hemoglobin molecule, in the jaundiced samples. We hypothesize that there could be a change in the hemoglobin structure within the intact red cell when exposed to increased plasma bilirubin. With further research, we propose to elucidate the effect of serum bilirubin on the Raman spectra of erythrocytes.

## Study of glycemic control and renal damage in type two Diabetes Mellitus

Sapna A,<sup>1</sup> Dr Ravikiran Kisan,<sup>\*2</sup> Dr Swapnali,<sup>3</sup> Dr Paveenkumar Devarbhavi<sup>4</sup> Dr D V Deshpande<sup>2</sup>

P273

<sup>1</sup> MBBS Student, SSIMS & RC Davangere, Karnataka; <sup>2</sup> Department of Physiology, SSIMS & RC Davangere, Karnataka; <sup>3</sup> Department of Biochemistry, SSIMS & RC Davangere, Karnataka; <sup>4</sup> Department of Medicine, SSIMS & RC Davangere, Karnataka

**AIMS:** To study the glycemic control of past three months by HbA<sub>1c</sub> test and renal damage by urine microalbumin analysis in type two Diabetes Mellitus.

**OBJECTIVES:** 1. Assessment of glycemic control of past three months by HbA<sub>1c</sub> test in type two Diabetes Mellitus and 2. Assessment renal damage by urine microalbumin analysis in type two Diabetes Mellitus.

**METHODS:** Study was approved by Institutional Ethical Committee. Patients were recruited based on inclusion - exclusion criteria. Informed written consent was obtained. Under aseptic precaution 5 ml blood sample was collected and HbA<sub>1c</sub> levels was assessed by automated Nephelometer. Subjects mid stream of urine sample were collected for microalbumin assessment.

**RESULTS:** Present study results showed that renal damage was more common with poor glycemetic control.

**CONCLUSIONS:** To prevent complications of type two Diabetes Mellitus like renal damage better glycemetic control is must. Early detection of end organ damage (example: Renal damage by microalbumin) alarms the preventive strategies for further worsening of conditions.

\* **Corresponding author:** Dr Ravikiran Kisan, Department of Physiology, SSIMS & RC Davangere, Karnataka, drravikiran@kisan@gmail.com

## **Anti-diabetic activity of hydroalcoholic extracts of *Eugenia jambolana* seed in Wistar Albino rats**

P274

**Sarath Babu K<sup>1</sup>, Nagerndra Nayak I.M<sup>2</sup>, Madhavrao C<sup>3</sup>, Hebbal G.V<sup>4</sup>**

<sup>1,3</sup>Assistant Professor of Pharmacology and <sup>4</sup>Professor of Anatomy SMIMS, Kulasekharam [K.K District] Tamilnadu; <sup>2</sup>Professor of Pharmacology, K.S Hegde Medical College, Nitte University, Mangalore, Karnataka

**Introduction:** Insulin resistance is the major cause for development of type 2 DM. Long term/high dose administration of steroids can cause insulin resistance syndrome. *Eugenia jambolana* [E.J] seeds traditionally used to treat DM.

**Aims and objectives:** To evaluate the anti-diabetic activity of hydroalcoholic extract of *E.J* seed in dexamethasone induced diabetes

**Materials and Methods:** Wistar Albino rats were divided in 5 groups. Group-I [Saline], Group-II [Dexamethasone 4mg/kg/i.p], Group-III [Metformin 500mg/kg/orally+Dexamethasone 4mg/kg/i.p], Group-IV [*E.J* extract 6gm/kg/orally+Dexamethasone 4mg/kg/i.p], Group-V [*E.J* extract 12gm/kg/orally+ Dexamethasone 4mg/kg/i.p]. Standard drug and plant extract were administered to respective groups for 12 days. In study period of 7 to 12<sup>th</sup> day animals were also given dexamethasone 4mg/kg/i.p. On 12<sup>th</sup> day rat blood was collected and used for estimation of glucose and insulin. During the study period all the rat's body weight, food and water intake was measured. P<0.05 was considered statistically significant.

**Results:** The study showed significant decrease in blood sugar and insulin levels in Group III, IV and V when compared to Group II. There was also significant difference between Group IV and V when compared to Group III. There was significant difference was observed in physical parameters among groups.

**Conclusion:** Hydroalcoholic extract of *Eugenia jambolana* seed extract has significant anti-diabetic activity in dexamethasone induced diabetes in Wistar Albino rats.

**Corresponding Author:** Sarath Babu Kurra, **Assistant Professor**, Department of Pharmacology, Sree Mookambika Institute of Medical Sciences [SMIMS], V.P.M. Hospital Complex, Kulasekharam [K.K District], Tamilnadu -629161, Mobile: +91-9025495091

Email: babupharmac09@gmail.com

## Effect of yoga on autonomic functions and psychological status during menstrual cycle in healthy volunteers

P275

Sarita Kanojia, Asha Gandhi, Ajay Kukreja, Vivek K Sharma, Raj Kapoor

Department of Physiology, ESI College, Rohini, New Delhi

**Aims & Objectives:** To investigate the effect of yoga on autonomic parameters and psychological well-being during both phases of menstrual cycle in healthy volunteers.

**Methods:** 50 females in the age group of 18-20 years were randomized into two groups: Group I (n=25) subjects practiced yoga 35 minutes/day, six times per week for the duration of three menstrual cycles. Group II (n=25) subjects as controls. Following parameters were recorded at the beginning and after completion of three menstrual cycles: Height, weight, resting Blood pressure (BP), E:I ratio and 30:15 ratio, BP changes due to Isometric hand grip exercise, and cold pressor test. Psychological status was assessed by DIPAS inventory.

**Results:** There was significantly higher BW, sympathetic activity and blunting of parasympathetic reactivity and also, significantly higher scores of anger, depression, anxiety and decreased score of well-being in premenstrual phase as compared to postmenstrual phase in both the groups in initial cycle. There was significantly higher percentage decrease in BW, HR, BP in yoga group as compared to control group in both the phases from initial to second and onwards between second and third menstrual cycle. Also, there was significant improvement in psychological status in Group 1 subjects compared to control group in third cycle in premenstrual phase.

**Conclusions:** There is significant alteration of autonomic functions and psychological status in premenstrual phase even in young healthy females and regular practice of yoga has beneficial effect on both phases of menstrual cycle.

**Corresponding address:** Dr Sarita Kanojia, Assistant Professor, Department of Physiology, ESI College, Rohini, New Delhi-110085 Mobile: 9818062295 Email: drsaritavikas@gmail.com

## Understanding the Physiological Basis of Clinical applications of Saliva

P276

Sasi kumar.S\*, Semmal.M\*\*

Department of Physiology, Sri Ramachandra University, Chennai

Humans are endowed with three salivary glands namely, the parotid, submandibular, and the sublingual glands, which secrete saliva into the oral cavity. Saliva has a leading place in both basic as well as clinical research industries as well as in the realm of Psychophysiology. Saliva has earned its place as an important diagnostic tool for stress inflammation, infection, immunity level assessment and in other disease conditions.

Saliva can be collected by protocols accepted by researchers through simple, safe, non-invasive, affordable, accurate and non-stressful collection methods among the subjects. Previously samples of saliva were used to measure the levels of steroid hormones and immunoglobulins but nowadays an array of sophisticated techniques are available for researchers, as they can also evaluate the salivary components such as proteins, genetic materials like RNA, markers of nutritional status.

Salivary cortisol was frequently used as a bio-marker for psychological stress since cortisol is a clear stress index, with increased levels of cortisol correlating positively with increased levels of stress. Assessing the sympathetic functions of salivary amylase (Enzyme) used as a sympathetic marker for acute physical stress. In stress physiology saliva plays a major role.

Physiological importance of IgA in saliva significantly correlates with various stress and infectious states. Alpha amylase levels in saliva provide a non-invasive way to examine sympathoadrenal medullary (SAM) activity as salivary testing holds the promise of becoming a valuable and more widely used tool in both clinical and experimental aspects of psychophysiology.

### **Study of peripheral neuropathy in patients with sickle cell disease.**

**Satarupa Dash**

P277

Department Of Physiology; V.S.S Medical College, BURLA

**Objective:** To find out the correlation of peripheral nerve involvement in patients with sickle cell disease through nerve conduction study.

**Method:** Thirty patients (M=23,F=7) with established sickle cell disease were taken in the present study for nerve conduction study. All were within the age group 15-45yrs. They were closely scrutinized for sign and symptom of clinical neuropathy. It was found that only 10 cases had features of clinical neuropathy. The control group contains 30 normal person within the same age group (M=20,F=10). A comparative study of nerve conduction velocity were done between sickle cell disease patients with neuropathy and without neuropathy and also compared with normal laboratory value. The study include the following things : a) motor nerve conduction study; b) sensory nerve conduction study; c) F wave; d) terminal latency

**Results:** In the present study motor nerve conduction velocity (MNCV meter/sec) and sensory nerve conduction velocity (SNCV meter/sec) in different nerves were compared with laboratory value (30 normal persons). The mean MNCV was delayed in patients with neuropathy when compared with sickle cell disease without neuropathy and also with normal laboratory value ( $p < 0.001$ ). Similarly mean SNCV was delayed in patients with neuropathy when compared with sickle cell disease without neuropathy and also with normal laboratory value ( $p < 0.001$ ). It was observed that terminal latency of MNCV is prolonged ( $p < 0.05$ ) in sickling patient with neuropathy. In patients with clinically evident root involvement did show prolongation of F wave as compared without root involvement.

**Conclusion:** The sickle cell disease, an inherited disorder is said to be having world wide distribution but its prevalence is restricted to some areas of few developing countries. In India sickle cell disease is common in Western Odisha. Recurrent vasoocclusive crisis is well established complication of sickle cell disease. The nerve roots and peripheral nerves may like wise be damaged due to vasoocclusive crisis. Nerve conduction study is useful for early detection of neuropathy and also be used to test the progression and effect of treatment in patients having sickle cell disease with neuropathy.

**Corresponding address:** Dr. Satarupa Dash; Department Of Physiology; V.S.S Medical College, BURLA ; Email: satarupa.sbp@gmail.com

## A comparison of the antinociceptive effects of a novel and conventional antiepileptics with conventional analgesic in biphasic pain model of formalin test in Albino rats

Saurabh Kansal, Ruchi Tyagi, Juhi Kalra, Taruna Sharma, D.C.Dhasmana

P278

**Introduction-** Some anticonvulsants have been shown to be clinically efficacious in treatment of neuropathic pain and being used by clinicians.

**Material & Methods-** This study determined the analgesic effect of Carbamazepine (A conventional) and Levitiracetam (A novel anticonvulsant) in rats in different types of pain in Formalin test having characteristic 2 phases, 1<sup>st</sup> phase i.e. Early phase reflect acute while 2<sup>nd</sup> phase i.e. Late phase denoting chronic inflammatory pain and compared its potency with a conventional opioid analgesic Tramadol.

**Results-** Per oral administration of Carbamazepine produced significant antinociceptive effect in late phase of formalin test but not or negligible suppress the pain in early phase of formalin test. Levitiracetam produced no any significant reduction of pain in both phases of formalin test while control drug Tramadol produced significant reduction of pain in both phases of formalin test.

**Conclusion-** As first phase of formalin test reflects acute pain while second phase of formalin test reflects chronic inflammatory pain, the results showing that Carbamazepine could be effective and significantly suppress the pain in various clinical condition associated with chronic inflammatory pain as Carbamazepine has been found significantly effective only in second phase of formalin test in our study.

## Pulmonary function tests in petrol pump workers

Savita Kittad, U.S.Patil, S.R.Vaidya, S.A.Shinde, M.K.Parekh

B.V.D.U.Medical College, Sangli

P279

**Aim:** To assess the effect of petroleum products on lung functions in Petrol pump workers.

**Objectives:** Study of FVC (Forced Vital Capacity), FEV<sub>1</sub> (Forced Expiratory Volume at 1Second), PEF<sub>R</sub> (Peak Expiratory Flow Rate) in petrol pump workers according to their duration of exposure ( 1to 5 year and more than 5 year).

**Methods:** Pulmonary Function Test was done by using computerized spirometer

Spiro Excel in 73 petrol pump workers. 71 subjects were taken as Control. The duration of the exposure was noted. Statistical analysis is done by using ANOVA.

**Results:** In petrol pump workers who were exposed for more than 5 years there is Significant reduction in FEV<sub>1</sub> and FVC and there is no significant change in other parameters. In petrol pump workers who were exposed 1 to 5 years, no significant change was observed.

**Conclusion:** Present study shows that long term exposure to the petrol vapors leads to restrictive type of lung disease in petrol pump workers.

## The effect of vocal and instrumental music on cardio respiratory variables, energy expenditure and exertion levels during sub maximal treadmill exercise

Savitha D, Sejil TV, Shwetha Rao, Roshan CJ, Sandhya T Avadhany

P280

**Aims and objectives:** The purpose of the study was to investigate the effect of vocal and instrumental music on various physiological parameters during sub maximal exercise.

**Methods:** Each subject underwent three sessions of exercise protocol - without music, with vocal music, and instrumental versions of same piece of music. The protocol consisted of 10 min treadmill exercise at 70% HR<sub>max</sub> and 20 min of recovery. Minute to minute heart rate and breath by breath recording of respiratory parameters, rate of energy expenditure and perceived exertion levels were measured.

**Results:** The heart rate, oxygen consumption, rate of energy expenditure and exertion levels were significantly lower with both vocal and instrumental music compared to the 'no music' group during exercise ( $p < 0.05$ ) with no significant differences in the effect between the two groups.

**Conclusion:** Both vocal and instrumental music has relaxant effect which allows the person to exert to the same extent and exercise at a lower heart rate and with lesser oxygen consumption with fewer calories burnt. Thus same amount of work is accomplished at lower cardiovascular and respiratory exertion levels.

**Key words:** vocal music, instrumental music, heart rate, oxygen consumption, energy expenditure, perceived exertion.

**Corresponding address:** Dr. Savitha D, Assistant Professor, Department of Physiology, St. John's Medical College, John Nagar, Bangalore - 560 034 Karnataka, India. Email: -haisavitha@yahoo.com Mobile: +91 9945133055

## Faculty perceptions regarding introduced 'Integrated teaching' in Physiology

Seema Kumar, Nilesh Tatkare, Srinath Chanramani

P281

**Introduction:** Integrated teaching interlinks all the subjects for students enhancing co-relation of pre-clinical concepts clinically thereby, improving their retention of knowledge. A pilot study undertaken to introduce vertical integration in first year of medical curriculum and to assess the outlook of faculty towards it; in comparison with present traditional teaching

### Methodology

To implement integrated teaching a committee comprising faculties from all phases was formed. After a series of meetings of committee, inputs from basic science, para-clinical and clinical departments, topics for integrated teaching, schedule and contents in form of integrated modules were constructed. The integrated modules integrated contents from Physiology, Pathology and Medicine. Faculties from all streams were appointed to conduct integrated teaching. Integrated sessions were conducted using integrated modules by all appointed faculties together. At end of integrated teaching programme a structured questionnaire was given to faculties to evaluate their perceptions on the new teaching-learning method.

### Results

85% faculty felt integrated teaching leads to better learning and clinical co-relation among students and 90% think it would be more helpful to them in their clinical practice. 70% felt new method is more interesting for students, 80% think it can improve retention of knowledge. While 90% feel it is more time consuming and 35%

think integrated teaching can improve exam results. 95% opine that more topics should taught by integrated teaching.

### Conclusions

Faculty has positive attitude towards integrated teaching. Therefore, integration teaching on few clinically relevant topics can be introduced along with traditional teaching in first year of medical curriculum.

## Association between local muscle function and cardiorespiratory fitness

P282

Sejil T.V.

**Objectives:** To assess the association between local muscle function and the whole body endurance in young healthy Indian population.

**Methodolgy:**80 subjects performed Queen's College Step Test; VO<sub>2</sub>max was estimated by predicted equation. Maximum handgrip (MHG), static and dynamic endurance were determined through hand dynamometry. Spearman's correlation was used to determine the association between whole body endurance and local muscle function parameters.

**Results:** Significant difference observed in anthropometry between genders. MHG of the dominant (41.7kg vs 24.9kg;p<0.01) and non-dominant(37.9 kg vs 21.9kg;p<0.01) hand showed significant gender difference. No significant difference in MHG after correcting for forearm muscle area and height. Predicted VO<sub>2</sub>max showed significant gender difference (Males:44.1ml/kg/min vs Females:32.8ml/kg/min;p<0.01). The Area Under Curves (AUCs) of the static and dynamic endurance parameters were significantly different, the slope of the decay curves were similar between genders. The association between the MHG and VO<sub>2</sub>max was found to be inconsistent and insignificant (Males:r = 0.128;females:r = 0.200).

**Conclusions:** Since the association between VO<sub>2</sub>max and MHG strength was inconsistent, these parameters might not be co-dependent and could be bringing out the beneficial effect through different mechanisms. Although gender differences in MHG are significant, the pattern of decay and the slope are similar, suggesting that there are no qualitative differences in the skeletal muscle characteristics.

## Correlation between intraocular pressure (IOP) and blood pressure (BP) in offsprings of type 2 diabetic patients

P283

Shailaja S. Patil

Department of Physiology, S. Nijalingappa Medical College, Bagalkot, Karnataka

**Background:** Glaucoma is one of the leading causes of acquired blindness. Glaucomatous optic nerve damage is likely to be associated with high IOP which is a modifiable risk factor. Diabetes is a risk factor for raised IOP and familial inheritance is known with diabetes and also glaucoma.

**Aim:** To study the relationship between IOP and BP and also body mass index (BMI) in offsprings of type 2 diabetes mellitus (DM) and to predict the future onset of glaucoma in them.

**Methods:** 25 students having parental diabetic history among first year MBBS students were included as cases and 23 with no parental diabetic history as controls. Height, weight, blood pressure and IOP in both the study and control groups were recorded and compared. Statistical analysis was done by student t test and Pearson's correlation.

**Results:** Mean IOP of cases and controls was 14.8 mmHg and 15.15 mmHg; and Mean arterial pressure (MAP) was 88.2 mmHg and 91.1 mmHg respectively. Cases exhibited a lower IOP, BMI and MAP compared to controls and showed negative correlation between them.

**Conclusion:** Offsprings of diabetic patients may be less prone for primary open angle glaucoma in future.

**Correspondence address:** Assistant Professor, Department of Physiology, S. Nijalingappa Medical College, Bagalkot, Karnataka, India. **E-mail:** drshailajapatil@gmail.com

## Understanding cardiovascular adaptation at first and second trimester of normal pregnancy

<sup>1</sup>Shalini Sharma, <sup>1</sup>Anil kumar Pandey, <sup>2</sup>Sunita Siwach, <sup>2</sup>Vijayata H, <sup>1</sup>Jeevandeep Kaur

P284

<sup>1</sup>Department of Physiology; <sup>2</sup> Department of Obstetrics and Gynecology; BPS Govt. Medical College for women, Khanpur kalan, Sonapat, Haryana.

**Background:** Pregnancy is accompanied by various physiological adaptations in the cardiovascular system. However, information on central blood pressure, wave reflection and arterial stiffness in pregnancy is limited.

**Aims and Objectives:** To evaluate the role of central arterial stiffness and pulse wave velocity to define physiological basis of cardiovascular adaptation during various trimester of pregnancy.

**Material and Methods:** The study was conducted in department of Physiology and Obstetrics & Gynecology. Thirty-six women [mean age 23.4 ± 4.8 years] in first and second trimester of pregnancy and 35 healthy age matched controls were enrolled for the study. Arterial stiffness, central hemodynamic parameters and pulse wave velocity was assessed by periscope™.

**Results:** In comparison with non-pregnant participants, pregnant women had significantly lower mean [p= 0.04] and central systolic blood pressure [p=0.02], central pulse pressure [p=0.02] and augmentation index [p=0.02]. Similarly, the carotid femoral pulse wave velocity [cfPWV], ankle brachial index [ABI] and arterial stiffness were significantly higher in pregnant women than in healthy non-pregnant controls [p=0.001, 0.001, 0.006] respectively.

**Conclusions:** Healthy pregnancy is associated with increased pulse pressure amplification as well as diminished wave reflection, which results in lower central augmentation index. Women in the second trimester of pregnancy have slightly higher arterial stiffness in comparison with healthy non-pregnant, age matched controls. The increased value of measures of arterial stiffness might be secondary to a known physiological increase of cardiac output and the amount of circulating blood.

**Corresponding address:** Dr Shalini Sharma, Assistant Professor, Pharmacology, PGIMS Rohtak-124001, Haryana. Email: shalinisharmabpsgmsonepat@gmail.com

## Correlation between haemoglobin percentage and cognitive function in children from rural area.

Shama D.J; Anupama D.; Nagalakshmi V.; S.L.Karne.

P285

Department of physiology, S.D.M. College of Medical Science and Hospital, Dharwad

**Aims:** Anemia is a common nutritional disorder which is prevalent in developing country like India. Iron deficiency affects both physical and mental health of humans in all age groups, which can be easily diagnosed by decreased Hb%. Academic performance can be improved by correcting anemia due to iron deficiency if detected at the earliest.



**Objectives:** To demonstrate correlation between Hb% and cognitive function in school children from rural area with the similar socioeconomic background.

**Materials & Methods:** The study included 60 residential school children (age 9-10 years). Boys (n=48) & girls (n=12). (1) Hemoglobin% was estimated by Sahli's method. (2) Cognitive skills evaluated by using the MMSE (mini mental state examination) scale designed by Folstein et al. (3) Academic performance based on Z score in mathematics and language of unit test was considered.

**Results:** MMSE scores increased with increase in Hb% (Mean: 11.5+/-1.3), but correlation was not statistically significant ( $r = .162$ ,  $p = .218$ ). Also there was no significant co-relation between Hb% and Z score in mathematics ( $r = -.007$ ,  $p = .960$ ) and language ( $r = -.140$ ,  $p = .285$ ).

**Conclusion:** No significant correlation was found between Hb% and cognitive level in our study. Also validity of MMSE below 10 years is questionable.

**Key words:** Hb%, Cognition, MMSE, school going children.

**Corresponding address:** Shama D J; 2<sup>nd</sup> year Post Graduate student; Dept. of Physiology; SDM College of Medical Sciences & Hospital, Sattur, Dharwad Email: dr.shamadj@gmail.com or shama\_dj@yahoo.co.in

## Effect of classical instrumental music on perceived stress, a comparison between Indian and Malaysian 1<sup>st</sup> yr medical girls - A randomised control trial

P286

Shantala S. Herlekar, V.J. Watve

Department of Physiology, KLEs J N Medical College, Belgaum- 590010, Karnataka

**Aim:** To establish common mode of stress relief for better interpersonal relations and improving medical education.

**Objective:** To assess the effect of classical instrumental music on perceived stress in 1<sup>st</sup> year medical girls of Indian and Malaysian nationality

**Method:** 30, 1st year medical girls of Indian and Malaysian nationality respectively (total=60), studying in KLEs J. N. Medical College Belgaum, were randomised into 2 subgroups each. One subgroup of 15 students was exposed to music while performing stressful concentration tests, while other group did the same tests without music. Perceived anxiety was assessed in all the students before and after the tests by STATE TRIAT ANXIETY INTERVENTION-Y FORM (STAI-Y).

**Results:** Mean age of 30-Indian and 30-Malaysian girls was 18.6±.85 years and 20.5±.68 years respectively.

- STAI-Y *pre test* score in Indian girls was 35.5± 9.68 compared to Malaysian girls 33.6±7.29 ( $p=0.055$ ).
- STAI-Y *Post test* score in subgroups showed, Indian girls with music was 34.4±8.66 (average 2.27 decline) while Indian girls without music showed an average 2.73 decline from pre test. Malaysian girls with music showed an average 3.47 decline from pre test. Only Malaysian girls without music showed *rise* of 6.47 from pre test levels ( $p=.006$  compared to Malaysian girls with music).

**Analysis Of Results:** Indian girls perceived more anxiety than Malaysian girls at baseline levels. Malaysian girls respond best to music, its effect being negligible on Indian girls.

**Conclusion:** Classical instrumental music can alleviate perceived stress in Malaysian medical girls but not much in Indian girls.

**Key Words:** Instrumental music, Indian medical girls, Malaysian medical girls, STAI-Y.

**Corresponding address:** Shantala S. Herlekar, Department of Physiology, KLEs J N Medical College, Belgaum-590010, Karnataka, **Email:** shantala.herlekar@gmail.com

### **Comparison of salivary glucose and blood glucose in type II diabetics and healthy adults in fasting state: a pilot study**

P287

**Sharon M.P., S.Srikanth, A.S.Anil Kumar**

Department of Physiology, Kempegowda Institute of Medical Sciences, Bangalore

**Aim:** The aim of this study was to examine the relationship between salivary and blood glucose in diabetics and healthy adults.

**Materials and Methods:** 30 adults in the age group of 30 - 50 years were included in the study. They were divided into 2 groups - diabetics and healthy adults. Blood and saliva samples were obtained from subjects after an overnight fast. Blood samples were analysed with hexokinase enzyme using automated analyser and saliva samples with glucose oxidase enzyme using a colorimeter. The difference in salivary glucose levels between the study groups was determined by unpaired t-test and correlation between blood and salivary glucose levels by correlation test.

**Results:** The salivary glucose levels were higher in diabetics and difference was significant. There was negative (non-significant) correlation seen between blood and salivary glucose levels in both groups.

**Conclusion:** The salivary glucose levels are higher in diabetics. There is negative correlation between blood and salivary glucose levels in this sample size.

### **Preliminary study on hypothyroidism with dynamic pulmonary function status and body fat composition**

P288

**Sharon Roel<sup>1</sup>, O. Punyabati Devi<sup>2</sup>**

Department of Physiology, RIMS, Imphal, Manipur. **Email:** roelsharon11@gmail.com

**AIMS:** To assess any functional lung impairment and body fat percentage status in hypothyroid patients

**METHODS:** The study was conducted in Department of Physiology, RIMS. 15 hypothyroid patients with TSH  $\geq 10$  mIU/L aged between 23-52 yrs were studied. Computerised spirometric studies were conducted by means of HELIOS 701. BMI with body fat percentage was analysed by Tanita Innerscan body composition. The spirometric parameters studied are FVC, FEV1, FEV1/FVC, FEF25-75%, PEFr.

**RESULT:** Results expressed in means and standard deviation. The mean % predicted value of FVC, FEV1, FEV1/FVC, FEF25-75, PEFr were  $89.06 \pm 13.18$ ,  $105.93 \pm 18.16$ ,  $118.13 \pm 5.47$ ,  $90.34 \pm 25.27$  and  $69.74 \pm 17.15$  respectively. The mean value for BMI was  $24.93 \pm 4.68$ , fat percentage  $30 \pm 10.92$ , TSH(mIU/L)  $59.86 \pm 72.58$ . Out of the total 15 patients, 4 had a restrictive pattern of lung function impairment. The mean age was  $36.86 \pm 10.6$  with 80% female and 20% male. The mean duration of illness was  $15.86 \pm 10.39$

**CONCLUSION:** Increased TSH does not necessarily cause impairment of spirometric lung function and the body fat % is within the healthy range in accordance to the WHO BMI guidelines.

**Corresponding address:** Dr.Sharon Roel, PGT Physiology deptt, RIMS; Prof. O.Punjabati, Professor, Physiology deptt, RIMS

## **A single instructional tutorial improves presentation of answers in first year medical students**

P289

**Sheetal C N , Veena Umesh B , Sudhakar H H**

**Introduction:** Writing skills are an important part of communication. Good writing skill allows communicating the message with ease and clarity to the examiner. Poor writing skills create poor first impressions and may have a negative impact on exam scores.

**Aims & objectives:** To evaluate the effect of a writing skill tutorial on presentation of answers in first year medical students.

**Methodology:** 144 first-year medical students who had already written their first internal assessment were divided into four small groups. A 90 minute interactive tutorial on writing skills was developed and presented to each of the four groups. The students took their second internal exams fifteen days after the tutorials. Later both first and second internal answer papers were compared for any improvement in their writing skills.

**Results:** There was no significant difference between first and second internal answer papers in non specific aspects like margins & bulleting but significant differences were seen in aspects like use of flow charts, diagrams & applied aspects.

**Conclusion:** Implementation of a small-group, pre-exam tutorial improves presentation of answers in exams.

## **A retrospective study of association between maternal hemoglobin and fetal birth weight in RRMCH**

P290

**Shilpa M, Ujwala N. Jagdale, Ranganath M.D**

**Aim:** To know the association between maternal hemoglobin and fetal birth weight.

**Objectives:** To find out whether the maternal hemoglobin during third trimester has any effect on fetal birth weight.

**Methods:** The study group comprises of 500 women with singleton term pregnancy who has delivered full term normal babies during the period of six months from January 2013 to June 2013, in the department of OBG in RRMCH with no morbidities. The personal data and Hemoglobin levels of mothers in third trimester and respective fetal birth weight will be taken from the labor room and pathology records maintained in the department of OBG and Pathology, at RRMCH. The results are analyzed using basic descriptive analysis.

**Results:** The number of low birth weight infants (65.8%) was significantly more in the anemic group of mothers than the non anemic group (11.4%).

**Conclusion:** The results of this study show an association of maternal anemia in pregnancy with increased risk of LBW babies. Higher hemoglobin did not show any effect on either birth weight or gestation in our study.

**Keywords:** Maternal hemoglobin, Fetal Birth Weight, Third trimester Hemoglobin.

## Electrocardiographic changes in different phases of menstrual cycle

P291

Shilpa Patil, B S Malipatil

Department of Physiology; M.R.Medical College,Gulbarga

**Background:** Menstruation is unique and nearly universal experience in females and is poorly understood .It is characterized by co-ordinated sequence of hormonal changes but the Electrocardiographic (ECG) changes have not been clearly established.

**Aims and Objectives:** To compare ECG changes in different phases of menstrual cycle.

**Methods:** The present study was carried out on healthy female medical students in the age group of 18 to 23years with normal menstrual cycle of 27-33 days. ECG changes were studied on 2<sup>nd</sup>,11<sup>th</sup>, 22<sup>nd</sup> day of menstrual cycle i.e Menstrual phase,Proliferative phase and Secretory phase of menstrual cycle respectively using AD INSTRUMENT-POWERLAB ® /30 SERIES.

**Result:** Heart rate was significantly ( $P<0.05$ ) increased in proliferative phase compared to menstrual phase. PR Interval & QT interval showed no significant changes during various phases of menstrual cycle.

**Conclusion:** ECG changes may be attributed to blood volume changes due to electrolytes and hormonal changes. The changes in the present study may have significance in terms of normal reference interval & this was an attempt to evaluate conflicting reports on menstrual cycle and their impact on health status.

**Keywords:** Menstrual cycle; Electrocardiography.

## The inter-dependence between beliefs and feelings about a *yagna*

P292

Shivangi Pathak, Shirley Telles, Nilkamal Singh and Acharya Balkrishna

Patanjali Research foundation, Haridwar, India

**Aims and Objectives:** This study was intended to correlate beliefs that a *yagna* does have beneficial effects with self-rated feelings after witnessing the *yagna*.

**Methods:** The participants were 172 patients with different illnesses who witnessed a *yagna* performed during a residential yoga therapy camp. The age range of the participants varied between 20 and 70 years, (group mean  $\pm$  S.D,  $46.0 \pm 12.3$  years). There were 83 females in the group of 172 who witnessed the *yagna*. The participants were seated around the site at which the *yagna* was performed for the last 45 minutes before the *yagna* ended. They were all given two questionnaires (i.e., about beliefs and about feelings) to fill in. The data were extracted by measuring the distance from the zero ends of the linear analog scale to the mark made by the participants on the linear visual analog scale. Each of the five values related to beliefs were tested for correlation with each of the four values related to the feelings after the *somayagna* using SPSS (Version 18.0) to perform the Pearson correlation test (two tailed).

**Results:** Beliefs about positive effects were positively correlated with positive feelings. The single negative feeling assessed (i.e., feeling physically tired) did not correlate with beliefs about the benefits of the *yagna*.

**Conclusions:** When considering subjective responses to any intervention which has philosophical and spiritual components, it is desirable to assess participants' beliefs about the intervention.

**Correspondence address:** Shivangi Pathak, Email- shivangi.yoga@gmail.com

## Changes in anthropometric and lipid profile in healthy young offspring of diabetics are not temporally linked

P293

Shobha M.V, Ravindra P.N, Deepali.A.

Sri Siddhartha Medical College, Tumkur

**Aim:** Family history of type 2 Diabetes Mellitus (DM) is a major risk factor for the development of type 2 DM, thus this study aim to evaluate the anthropometric and metabolic parameters in offspring's with and without family history of type 2 diabetes.

**Methods:** Healthy volunteers with family history of DM (n=50) and without family history (n=50) were recruited. Anthropometric measurements, fasting blood sugar and lipid profile were estimated.

**Results:** Cases showed significant increase in their anthropometric measurements than controls; and they also demonstrated significant increase in total cholesterol, LDL and decreased HDL and HDL/LDL ratio. Cases were further categorized into two subgroups based on BMI (group 1, BMI=21.55±1.73, group 2, BMI=29.03±4.32). Group 2, inspite of showing significant increase in their anthropometric measurements than group1, the lipid profiles were comparable. Thus, demonstrating a temporal dissociation between anthropometric and lipid changes, former preceding the later

**Conclusion:** Thus, in younger age group, anthropometric measures could be used for risk stratification and as a metric to evaluate the efficacy of preventive intervention

**Key words:** Family history, Type 2 DM, Anthropometric variables, Lipid profile.

## Variations in cold pressor test among football players

P294

Shobith Bangera<sup>1</sup>, Sheela Bhatia<sup>2</sup>

<sup>1</sup>Department of Physiology, Yenepoya Medical College, Deralakatte, Mangalore, 575018. Karnataka, India; <sup>2</sup>Department of Physiology, KVG Medical College, Sullia . Karnataka, India.

**Background:** Life in modern age is full of stress. Stress deranges health as a result of increased sympathetic activity leading to decrease in both quality and quantity of life. Hence restricting its activity along with increasing the parasympathetic response is way of coping with the effects of stress. The present study was designed to analyze the effects of exercise to decrease the effects of stress.

**Aims and Objectives:**To evaluate the stress suppressing efficiency of playing football by testing its effect on heart rate and cold pressor test.

**Method:** 60 healthy male volunteers (age group 16-25 years) were selected from the student population of Private Medical College, Karnataka. Footballers group (n=30, group1), control group (n=30, group 2). After one month of regularly playing football by group 1, cold pressor test was done. The findings were compared statistically with the control group.

**Results:** Heart rate was significantly lowered in group 1 (p<0.05). A Decreased response to cold pressor stress (p<0.05) was seen in group 1.

**Conclusion:** Group 1 showed an increase in parasympathetic activity by showing a decrease in resting heart rate as well as blunting of response to cold pressor. Playing football regularly is both a fun activity and has positive effect on health.

**Corresponding address:** Assistant Professor, Department of Physiology, Yenepoya Medical College, Deralakatte, Mangalore, 575018. Karnataka, India. Email: shobang2008@gmail.com, (R) Flat 2A, 3<sup>rd</sup> Floor, MN Towers, Opp Kadri Service Station, Kadri Mangalore 575002.

### **Anthropometry and Physical fitness in normotensive offspring of hypertensive parents**

**Shrilaxmi C Bagali**

P295

Dept of Physiology, BLDEU's Shri B.M.Patil Medical College, Bijapur

**Introduction:** Parental history of hypertension, central (abdominal) fat accumulation and low physical fitness are associated with elevated risk of developing hypertension.

**Objectives:** To record anthropometric parameters and physical fitness in normotensive offspring of hypertensive parents ( $O_{Hyp}$ ) and to compare the results with offspring of normotensive parents ( $O_{Norm}$ ).

**Methods:** 37 apparently healthy medical students with parental history of hypertension ( $O_{Hyp}$ ) were recruited for the study and compared with 30 medical students without parental history of hypertension ( $O_{Norm}$ ). Anthropometric parameters like Height, Weight, waist circumference, hip circumference were recorded. Body surface area, Body mass index, waist-hip ratio, waist-height ratio were calculated. Waist-hip ratio and waist-height ratio have been used as markers of central body fat distribution. Physical fitness was assessed using modified Harvard step test. Physical fitness index (PFI) (%) was calculated.

**Results:** Weight, BMI, waist and hip circumference, waist-hip ratio, waist-height ratio, systolic blood pressure were significantly ( $p < 0.05$ ) higher and physical fitness index was significantly lower ( $p < 0.05$ ) in  $O_{Hyp}$  compared with  $O_{Norm}$ .

**Conclusion:**  $O_{Hyp}$  have excess central body fat and reduced physical fitness which enhance the risk of future development of hypertension. Early identification of those at risk and implementation of life style modifications may prevent or delay the onset of hypertension.

**Key words:** Family history of hypertension, Physical fitness index, waist-hip ratio, waist-height ratio

**Corresponding address:** Assistant Prof, Dept of Physiology, BLDEU's Shri. B.M.Patil Medical College, Bijapur-586103 **E mail id:** shrikots@yahoo.in

### **An *in vitro* study of acetylcholine, histamine and temperature induced contractile responses of colon and rectum in neonatal rats**

**Shuchita Singh, M. B.Mandal**

P296

Department of Physiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi.

**Aims:** To understand characteristics and to explore the possible mechanisms involved in gut contractility in neonatal rats.

**Objective:** The contractile characteristics of neonatal gut are not clearly known. Thus, present study was undertaken to assess acetylcholine (ACh), histamine and temperature induced contractile responses of colon and rectum in neonatal albino rats.

**Method:** Adult (6-8 months) and neonate rats (10-17 days) of Charles Foster strain were used. Isometric contractions were recorded from isolated longitudinal strips of rectal and colonic tissues using organ bath preparations.

**Results:** In both adult and neonates, ACh (0.001-100 $\mu$ M) produced significantly ( $p < 0.05$ ) greater contractile responses in rectum as compared to colon and was significantly ( $< 0.05$ ) blocked by atropine pretreatment. Blocking effect was higher in adult preparations. Histamine (0.001-100 $\mu$ M) induced responses were similar in rectum and colon. Pheniramine (100 $\mu$ M) pretreatment significantly ( $p < 0.05$ ) increased histamine (100 $\mu$ M) induced contractions in adult rectum but not in neonate rectum and colon.

In neonatal rats contractile tension (g/g wet tissue) was significantly ( $p < 0.05$ ) greater as compared to adult rectum but frequency of contractions was significantly ( $p < 0.05$ ) more in adult rectum. Contractile tension in colon of neonate and adult was not significantly ( $p > 0.05$ ) different as temperature changes from 37 $^{\circ}$ C to 10 $^{\circ}$ C.

**Conclusion:** Thus, present results indicate that neonate has different contractile responses in rectal and colonic tissue to ACh, histamine and temperature that may be due to immaturity of gut development.

**Corresponding address:** Shuchita Singh, Department of Physiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi-221005. Email:shuchitasingh2010@gmail.com

## Perception of color in males and females

P297

Shweta Patil, B S Malipatil.

**Background:** Men and women experience appearance of colour differently, which may be linked to hormonal, developmental and environmental differences amongst both sexes.

**Aims and objectives:** This study was done to evaluate the difference of normal colour vision between two sexes of same age group.

**Materials and methods:** The study was done in the department of Physiology, M .R .Medical college, Gulbarga on 60 ocular healthy subjects (equal number of males and females) of 17–20 yrs age group. There were 21 test colour wools and a shade chart having various shades of different colours. The task was to match all the test colour wools with the shade chart. Total number of correct answers and the time taken to match all colours was noted and analysed in both sexes.

**Results:** The results of this study showed that, females gave more correct responses ( $P < 0.001$ ) and took less time ( $P < 0.05$ ) than males. Colour wise also, females gave more correct responses, especially for red ( $P < 0.01$ ) and green ( $P < 0.05$ ).

**Conclusion:** Females can see more shades of colours than males.

Key words: colour vision

**Corresponding address:** Shweta Patil, Department of physiology, M R Medical College

Gulbarga.,Email: patilshwe@gmail.com

## Influence of age and sex on measures of heart rate variability in healthy subjects

P298

Shweta Sehgal \*, Rahul Kapoor \*\* and M.M. Khan \*

Department of Physiology, Career Institute of Medical Sciences & Hospital, Lucknow, U.P., India\*, Department of Plastic Surgery, KGMU, Lucknow, U.P., India\*\*

**OBJECTIVE:** The study aimed to investigate the effect of age and sex on the heart rate variability (HRV) analysis.

**METHOD:** Age and sex data were collected from 160 subjects without cardiovascular conditions. Short-term HRV was recorded using Nivomon software. Subjects were divided by age into 10-year intervals and by sex for HRV analysis.

**RESULTS:** Heart rate decreased with increasing age and was significantly higher among women ( $p < 0.05$ ). Both the low frequency (sympathetic activity) and high frequency (parasympathetic activity) declined ( $P < 0.05$ ) as age increased. Low frequency and LF/HF ratio were significantly higher in male subjects, and high frequency which is index of parasympathetic modulation was significantly higher in the female subjects.

**CONCLUSION:** This study demonstrated that age and sex had a greater impact on HRV. The older age group had consistently lower HRV than younger people. Autonomic and parasympathetic activities attenuate with age in both genders.

**Corresponding author:** Dr. Shweta Sehgal, Assistant Professor, Department of Physiology, Career Institute of Medical Sciences & Hospital, Lucknow, U.P., India **Address:** Room no.-306, KGMU, Lucknow, (U.P.)-226003 **Email ID:** shwetajaipurr@yahoo.co.in

## Quantitative EEG changes in Mild Cognitive Impairment and Alzheimer's disease: Region and frequency specific changes of spectral power

P299

Shweta Shrama<sup>1</sup>, Manjari Tripathi<sup>2</sup> and Ratna Sharma<sup>1</sup>

1. Department of Physiology, AIIMS, New Delhi, 2. Department of Neurology, AIIMS, New Delhi

**Aim:** To study the region and frequency specific resting EEG oscillation characteristics in patients with Mild Cognitive Impairment (MCI) and Alzheimer's disease (AD).

**Objective:** To evaluate resting EEG spectral power analysis in MCI, AD and healthy subjects.

**Methods:** EEG was recorded (19 locations) at rest in control ( $n=26$ ), MCI ( $n=26$ ) and AD ( $n=27$ ) patients. MMSE and CDR scores were assessed. Spectral power analysis was done to elucidate differences among the three groups as per electrode location on the scalp and frequency. Spectral power at various regions was correlated with neuropsychological test scores.

**Results:** Frontal, central, parietal & occipital theta and lower alpha1 powers were highest in AD. Frontal, central, temporal lower alpha2 and upper alpha powers were lowest in AD as compared to MCI and control. Beta and gamma band powers were lowest in MCI and AD. Theta power was negatively correlated with MMSE score and positively correlated with power of lower alpha1 & 2, and beta bands.

**Conclusions:** Higher theta and lower alpha powers during resting condition in AD is considered deleterious for cognitive capacity. High correlation of theta, lower alpha1 & 2 and beta powers with MMSE scores is suggested earlier stages of AD.

**Corresponding address:** Prof Ratna Sharma, Stress and Cognitive Electroimaging Lab, Department of Physiology, AIIMS, New Delhi, Ph: 011 26504682, Email: ratnaaiims@gmail.com



## Adverse Drug Reaction monitoring in elderly on Psychotropic drugs in the Department of Psychiatry: a pharmacovigilance report

Shweta Srivatsa, Jayanthi C R, Chandrashekar H

Bangalore Medical College and Research Institute, K R Road, Bangalore.

P300

**Objectives:** To profile Adverse drug reactions in elderly patients on psychotropic drugs with causality assessment.

**Materials and methods:** A cross sectional, observational study was conducted for 2 months in the Department of Psychiatry as a part of Pharmacovigilance programme. A total of 70 elderly psychiatric patients ( $\geq 60$  years) were enrolled and their demographic details, clinical and drug details and adverse event history were recorded in CDSCO format as adopted in National Pharmacovigilance Programme. Causality of ADRs was assessed using WHO causality assessment classification.

**Results:** Out of 70 patients (42 females and 28 males) screened, Depression (30%) was the most common disorder seen followed by Schizophrenia and Psychosis (24.3%), Substance abuse 17.14%, anxiety disorder 14.2% and Dementia 7.1%.

Total number of patients experiencing ADRs is 50 (71.4%). Tremors (10%) and sedation (10%) were seen commonly. Antipsychotics (62%) were the commonest group of drugs causing ADRs, followed by Antidepressants (TCAs 20% and SSRIs 14%). Sedatives and Hypnotics accounted for 4% and mood stabilizer (lithium) 2%. Risperidone was the commonest incriminated drug (26%) followed by olanzapine (16%). Causality assessment revealed that 35 (70%) ADRs fell into "probable" category and 15 (30%) to "possible" category.

**Conclusion:** This study offers a representative profile of ADRs to Psychotropic drugs in Elderly patients in the Indian context.

## A cross sectional study on prescribing patterns of antiepileptic drugs in nonepileptic disorders at a tertiary care hospital

Shwetha H, C.R. Jayanthi

Department of Pharmacology, Bangalore Medical College and Research Institute, Bangalore, Email: shwetha.bhavani@gmail.com

P301

**Aim:** To analyze prescription pattern of antiepileptic drugs in nonepileptic disorders at a tertiary care hospital

**Methods:** Present cross sectional study was carried out in neurology and psychiatry departments of Bangalore Medical College for 6 months.

Patients who received antiepileptic drugs for nonseizure disorders were included in study. Data was entered in case recording proforma and analysed using descriptive statistics.

**Results:** Of 92 patients enrolled in study, 43 were males and 49 were female patients.

Most common nonseizure disorder was neuropathic pain [ 51 % ] followed by Bipolar Disorder [ 21% ] Migraine [ 13% ], Hyperkinetic disorders [ 9 % ], Generalised anxiety disorder [ 3% ] and Impulsive disorder in alcohol dependent patients [ 3 % ]. Most common antiepileptic drug prescribed was Pregabalin [ 31% ], followed by Carbamazepine [ 25% ], Valproate [ 17% ], Topiramate [ 9 % ], Oxcarbazepine [ 7% ], Lamotrigine [ 4% ] and Phenytoin [ 2% ],

**Conclusion:** Trend of prescribing both newer and older antiepileptic drugs is seen in present study.

## Correlation of hyperkalemia with ECG changes

P302

Sivakumar.N, Neelambikai.N

Department of Physiology, Coimbatore Medical College, Coimbatore.

**Background:** Hyperkalemia is defined as serum potassium level of more than 5 mEq/L. Severe hyperkalemia can lead to cardiac asystole and death, so identification and appropriate management of hyperkalemia is very important. There is a wide range of Electrocardiogram (ECG) changes associated with hyperkalemia. The studies regarding correlation of hyperkalemia with ECG changes are very limited.

**Aim & Objective:** This study aims to assess the correlation between the level of potassium and particular ECG changes in the presence or absence of diseases.

**Materials:** A total of 126 patients (72 males and 54 females) in the age group of 18-65 years were included in the study. They were selected from the IMCU, nephrology, and cardiology departments from Coimbatore Medical College Hospital, Coimbatore.

**Methodology:** The patients were selected on the basis of their serum potassium level which is above 5 mEq/L and whatever their diagnosis. The ECG was taken to all the patients and correlated the ECG findings with the biochemical value of the patients.

**Results:** 98 patients presented with renal failure, 6 patients with myocardial infarction and 22 patients with other diseases. Only 31 patients had ECG abnormalities and separated in 4 groups according to the potassium values as A (5 to 5.9 mEq/l), B (6 to 6.9 mEq/l), C (7 to 7.9 mEq/l) and D (above 8mEq/l). The p values of group A is 0.7604, B is 0.9471, C is 0.2428 and group D is 0.2811 and found statistically insignificant. The electrocardiogram was insensitive for diagnosing hyperkalemia. But the electrocardiographic changes increased with increasing potassium level.

**Discussion:** Hyperkalemia was diagnosed in all patients, however only 31 ECGs were reported abnormal with changes with hyperkalemia. This is consistent with previous reviews of ECG changes with hyperkalemia and the sensitivity of ECG for diagnosis of hyperkalemia is poor. Even with high serum potassium elevations, ECG cannot reliable to exclude the presence of hyperkalemia or to monitor therapy designed to lower the serum potassium concentration.

**Conclusion:** ECG manifestations are not consistent or indicative of severity of hyperkalemia. So hyperkalemia should be guided by clinical examination and serial potassium measurements.

## To study the antinociceptive effect of sucrose in human adults

P303

Smita .B. Mokal, Munira. Hirkani

Department of Physiology, Seth G. S. Medical College & KEM Hospital, Mumbai

**Background:** Sucrose-induced analgesia (SIA) has been known as non-pharmacological intervention for pain relief in both rat pups and infants. The mechanism underlying SIA is suggested to be mediated by the endogenous opioids system. This effect is produced by the sweet sensation rather than by the absorption of sucrose.

**Aims:** The SIA has been frequently investigated for the pain relief in infants but less so for SIA in adults. The aim of study is to explore the effect of sucrose on the pain tolerance time in adults.

**Objectives:** To study the effect of oral sucrose solution on pain tolerance time in adult humans.

**Methods:** The study is a pilot study with participants of age group 20-60 years. The pain is induced in the participants by cold stimuli using cold pressor test while holding mouthful of plain water (control) and sucrose solution (30%) and the pain tolerance time (sec) of the participants will be noted for each plain water and sucrose solution.

**Results:** The results, till now indicates an increase in the pain tolerance time on holding mouthful of sucrose solution.

**Conclusions:** The study is ongoing and the data will be collected from the sample within next month.

**Corresponding address:** Smita .B. Mokal, Department of Physiology, Seth G. S. Medical College & KEM Hospital, Mumbai, Email ID: drsmita8@yahoo.in

## Use of Social networking sites as an informal learning tool.

P304

**Smita Ramesh Rao Sorte**

16, sadichha colony, Vinayak nagar, Amravati, 444603, Maharashtra

**Background:** Facebook is widely used by students and faculty members in institutions of higher educational colleges and health professions. There are several aspects of the Facebook platform that could make it an effective educational tool. It could facilitate active learning and easy sharing or posting of current events, and could serve as an accessible, real-time, dynamic platform to allow course-related discussion.

**Aims and Objectives:** To update Knowledge, reinforce Knowledge of students on daily/ regular basis. To Increase student- Teacher (one to one) Academic interaction

**Methods:** A Facebook group named "Physio fever" was created. All willing students were invited to join the group. Various physiology topic were updated on this group. Students were informed to visit this group regularly and to like/ comment/ share and ask queries on this group page. At end of 2 months students valuable feedback and exam were taken.

**Results:** 80 % students were satisfied, 75% showed knowledge improvement and 75% felt convenient to approach teacher.

**Conclusions:** we concluded that social networking sites are useful tool to update students Knowledge and to Increase student- Teacher (one to one) Academic interaction.

**Corresponding address:** Dr. Smita Ramesh Rao Sorte, 16, sadichha colony, Vinayak nagar, Amravati, 444603, Maharashtra. Email : drsmyta@gmail.com

## Correlation between hemoglobin and whole body reaction time in residential school children of dharwad

P305

**Smruthi V, Priya S A, Nagalakshmi V, Shobha C Nallulwar.**

Department Of Physiology, SDM College Of Medical Sciences & Hospital, Sattur, Dharwad

**Aims & Objectives:** Today's men work invariably in complex setups where they are required to recognise and react to a variety of situations promptly and appropriately. Determination of Various types of reaction times can be used as an indicator of cognitive function. Cognitive function may be closely affected by decreased Hb%. This study was aimed at demonstrating a correlation between Hb% and cognitive function determined by WBSRT & WBCRT (whole body simple & choice reaction time) in residential school children from rural area in Dharwad district.

**Materials and Methods:** The study was conducted on 60 children, irrespective of sex, between 9 to 12 yrs of age. Hemoglobin % estimation was done by standard Sahli's method using disposable needle. Whole body reaction time (simple & choice) were recorded 3 times after appropriate instructions and trials, and lowest of the 3 readings considered. Statistical analysis for correlation between Hb% and whole body reaction times was performed using Pearson's correlation. p value <0.05 was considered as statistically significant.

**Results:** There exists a negative correlation between Hb and simple and choice whole body reaction time which is statistically significant (p=0.000).

**Conclusion:** Reaction time is negatively correlated with hemoglobin suggesting that as the Hb% decreases reaction time increases thus cognition decreases.

**Key words:** Hemoglobin , Whole body reaction time, cognitive function

**Corresponding address:** Smruthi V; 2<sup>nd</sup> year Post Graduate student; Dept. of Physiology; SDM College of Medical Sciences & Hospital, Sattur, Dharwad Email: smruthivnair@yahoo.co.in/smruthi8@gmail.com

### **A comparative analysis of non - invasive cardiovascular functions in proficient and non-proficient healthy subjects**

P306

**Snehasis Bhunia<sup>1</sup>, Bonny Bhunia<sup>2</sup>, Basavraj Aski<sup>3</sup>**

<sup>1</sup>Department of Physiology, U.P.Rural Institute of Medical Sciences and Research, Saifai (P.O.), Etawah Dist. U.P.; <sup>2</sup>Department of Zoology Ch PG College, Heora, Saifai (P.O.), Etawah Dist. U.P. <sup>3</sup>Department of Biochemistry, Shri B M Patil Medical College, Bijapur, Karnataka.

**Introduction:** Cardiovascular disease (CVD) is associated with the development of atherosclerotic process that begins in the arteries, representing vascular pathology, can be measured in the form of reflection index (vascular tone) and other non invasive cardiovascular parameters, leads to cardiovascular morbidity and mortality. Previous reports have described significant reduction on arterial stiffness and alteration on other related cardiovascular parameters in athletes as well as in proficient individuals. No report so far is available on comparative analysis of non invasive vascular parameters such as reflection index (vascular tone) termed as RI, Large artery stiffness index (SI), Dicrotic index (DI), Heart rate (HR), and cardiac parameters such as Left Ventricular ejection time (LEVT), Diastolic time, Ejection slope, dp/dt max in proficient and non proficient healthy subjects.

**Objectives:** To analyze the comparative differences of non - invasive cardiovascular responses in both proficient and non proficient healthy subjects.

**Methods:** Various non invasive cardiovascular parameters like RI, SI, DI, dp/dt max, LVET, pulse duration, diastolic time, ejection slope and also systolic, diastolic, mean and pulse pressure were studied by using PC based PPG analysis system.

**Results:** In the present study no statistical significant differences were found on body weight and age, dp/dt max and ejection slope in two groups (proficient and non proficient), but statistical significant differences were found on RI, SI, pulse duration, diastolic time, systolic (SBP), diastolic (DBP), Pulse (PP) and mean (MABP) pressure that would be attributed to increased parasympathetic tone in proficient as compared to non proficient subjects.

**Key words:** *Non invasive techniques, cardiovascular parameters, large artery stiffness index. Reflection index, left ventricular ejection time.*

**Corresponding address:** Dr S Bhunia, Professor, Department of Physiology, U.P. Rural Institute of Medical Sciences and research, Saifai, Etawah-206130, U.P. E Mail: drsnehasis65@yahoo.com Contact No. 09410487968 Fax No. 05688-276554

## Large scale isolation, Purification and Chromatographic analysis of bio active compounds from *Cleistanthus collinus*

P307

**Soosai Manickam Amirtham, Sathya Subramani.**

Department of Physiology, Christian Medical College, Vellore-2.

**Aims:** To isolate active principles of *Cleistanthus collinus* (*C.collinus*) by liquid/liquid partition chromatography and enrichment by Thin Layer Chromatography.

**Objectives:** *C.collinus* is a known toxic plant, used for self-harm in rural South India. The mortality is 28%. The exact mechanism of action of this poison is still unknown and there is no promising antidote till date. In this study we screened major active compounds from boiled and room temperature extract.

**Methods:** *C.collinus* leaves were shade dried and hexane delipidated. 100grams of leaves were soaked in 3 liters of distilled water for 24 hrs for room temperature extract. 100 grams of leaves were immersed in 2.5 liters of boiling distilled water for 10 minutes for boiled extract. The supernatant of both extracts were collected and mixed with Chloroform to form two immiscible layers. The bottom chloroform layer, separated with separating funnel sequestered the fluorescent compounds. The top aqueous layer did not have any fluorescent compounds. The fluorescent portion was concentrated and powdered. The active principles Cleistanthin A, Cleistanthin B and diphyllin in the fluorescent fraction were screened and purified by Thin Layer Chromatography.

**Results:** The chromatographic analysis of screened Cleistanthin A, Cleistanthin B and diphyllin were performed by TLC, HPLC, PDA, FTIR and GCMS. The HPLC of Cleistanthin-A and Cleistanthin-B showed 100% purity. Diphyllin was impure.

**Conclusions:** The screened phytochemicals can be used to study the action of individual active principles and to find a potential antidote, in the process.

## Thyroid function tests during first trimester of pregnancy

P308

**Soumya BA, Nagaraja S**

**Aims & Objective:** This study is aimed to emphasize the effects of normal pregnancy on thyroid hormone levels in the first trimester.

**Method:** 30 normal healthy pregnant women in first trimester between 20–35 years were selected from Bapuji Hospital, Davangere. 30 normal non-pregnant women in the same age group were selected randomly. 5ml of venous blood was drawn from antecubital vein with aseptic precautions, serum was separated and serum Total Triiodothyronine(TT<sub>3</sub>), Total Thyroxine(TT<sub>4</sub>) and Thyroid Stimulating Hormone(TSH) were estimated using thyroid profile ChemiLuminescenceImmunoAssay (CLIA) kit.

**Results:** Data analyzed using unpaired student t-test. Serum TSH was significantly low in pregnant women with mean TSH  $\bar{x}$  0.85  $\mu$ IU/ml than controls with mean TSH  $\bar{x}$  1.65  $\mu$ IU/ml. Though serum TT3 and TT4 levels were high in pregnant group, the difference was not statistically significant.

**Conclusion:** Blunting of serum TSH could be due to thyrotropic action of elevated human Chorionic Gonadotropin (hCG) near the end of 1st trimester. Thyroid Binding Globulin(TBG) induced by estrogen and relative iodine deficiency state in pregnancy leads to rise in serum  $TT_3$  and  $TT_4$  which is vital for the normal foetal development. Hence thyroid function tests in pregnancy should be interpreted against gestational reference intervals.

**Corresponding address:** Dr SOUMYA B A, Assistant Professor, S S Institute of Medical Sciences & Research Centre, NH - 4, Davangere - 577005 Email:Soumya.ba@gmail.com

## Variations of hematological parameters seen in anemia in pediatric age group

**Soumya Mishra, Dr. Magna Manjareeka**

P309

Department of Physiology, Kalinga Institute of Medical Sciences, Bhubaneswar, Odisha

**Introduction** -In the last few years, increasing attention has been paid to a new iron-related analysis, the concentration of circulating ferritin, as an indicator of the iron status of the body. The concentration of iron and of the iron-binding protein, transferrin, in serum varies markedly in different pathological and physiological conditions. Both concentrations (with transferrin being expressed as total iron-binding capacity: TIBC) are used in identifying various types of anemia.

**Materials & Methods-** In 250 anemic children, various parameters were analysed such as hemoglobin concentration, serum ferritin, serum iron, TIBC, Saturation %, Vitamin B12 and total RBC count. Using appropriate statistical analysis, correlation coefficient (Pearson's r-value) was estimated between these hematological parameters and the best indicator of anemic status in pediatric age group was studied.

**Results & Discussion** - The results for the 250 serum specimens taken clearly shows that the ferritin test is useful for detecting iron deficiency when the serum iron and TIBC tests are not positively indicative. In these cases, therefore, the ferritin test as a follow-up test is highly recommended.

## Development of non-transgenic animal model for Alzheimer disease

**Sowmya Madhavadas, Bindu M. Kutty, Sarada Subramanian**

P310

NIMHANS, Bangalore

Obesity, arising due to the dietary and life style changes, is fast reaching epidemic proportions all over the world. It is becoming a primary cause of insulin resistance. There is increasing evidence that the incidence of Alzheimer disease (AD) is significantly influenced by a cluster of metabolic diseases including diabetes and obesity. The aim of the present study is to test the suitability of experimentally induced obesity in rats as an experimental animal model of AD. It has been observed that administration of monosodium glutamate (MSG) to neonatal rats resulted in increased body mass index and serum glucose levels over the controls. Measurement of markers for AD-like molecular changes i.e. amyloid  $\beta$  and acetylcholinesterase levels showed marked elevation in these two parameters in the hippocampus of MSG-treated rats. Assessment of cognitive abilities by Barnes maze revealed spatial disorientation characteristic of AD. Administration of ghrelin receptor antagonist [D-Lys (3)] GHRP-6 to obese rats resulted in reduction of amyloid  $\beta$  in the tissue homogenates. These findings suggest that MSG-induced obese rats could serve as an experimental animal model for AD research.

*Key words:* monosodium glutamate, obesity, amyloid  $\beta$ , acetylcholinesterase, spatial memory, Alzheimer disease

## Pilot project of validation process of Kannada version of Global physical activity questionnaire

P311

**Sowmya Rajaram**

Assistant professor, Department of Physiology, Bangalore Medical College and Research Institute, Bangalore, India

**Aims:** To validate the Kannada version of global physical activity questionnaire

**Objectives:** To look for test retest reliability and convergent validity of the translated Kannada version of global physical activity questionnaire.

**Methods:** Two teams of bilingual, (Kannada and English) medical students (mother tongue was Kannada), translated and back translated, the English and Kannada versions of Global Physical activity questionnaire respectively. The English and Kannada versions were administered to 11 bilingual participants from community, 1 day apart in random order, and the Kannada version was re-administered after a gap of 7-10 days. The participants were instructed to fill the questionnaires without any help from others.

**Results:** The convergent validity was found to be 1, 0.96, 1, 0.98 and 0.99 for moderate intensity physical activity at work, physical activity during travel to and from places, vigorous intensity physical activity during recreation, moderate intensity physical activity at recreation and sedentary activity item questions respectively. The test-retest reliability for the same items as mentioned above was found to be 0.99, 0.927, 1, 0.94 and 0.95 respectively.

**Conclusion:** The validation process can be completed with a sample size of 60 participants.

**Corresponding address:** Dr Sowmya Rajaram, Assistant professor, Department of Physiology, Bangalore Medical College and Research Institute, Bangalore, India, Email: rajaram.sowmya@gmail.com

## Body shape index and heart rate variability: A study to assess association in healthy Indians.

**Sowmya S<sup>1</sup>, Sucharita S<sup>1</sup>, Tinku T<sup>2</sup>, Bharathi AV<sup>2</sup>**

P312

<sup>1</sup>Department of Physiology, St John's Medical College, Bangalore-34; <sup>2</sup> Division of Epidemiology and Statistics, Division of St John's Research Institute, Bangalore-34

**Background:** Body Shape Index (ABSI) a new anthropometric measure, representing visceral fat has shown to predict premature mortality across age and gender. Adiposity at a population level is traditionally monitored using BMI. Non invasive indices of Heart rate variability (HRV) are used as predictors of cardiac morbidity and mortality.

**Objective:** To compare the relationship between HRV and the two anthropometric measures (BMI and ABSI) in healthy Indian males across age range of 18 to 90 years.

**Method:** 178 healthy males underwent anthropometric assessment (weight, height and waist circumference). BMI and ABSI ( $WC / (BMI)^{2/3} * (Height)^{1/2}$ ) were calculated. Beat to beat changes in heart rate was assessed and power spectra at various frequencies were obtained in both absolute and normalized units.

**Results:** ABSI was significantly and negatively correlated with HRV (LF= -0.61, HF=-0.59, TP =-0.55). However, there was no association between BMI and any of the HRV indices. On regression analysis, only age entered the model and was significant. After adjusting for age, the magnitudes of associations of HRV indices with ABSI remained significant

**Conclusion:** ABSI is strongly associated with HRV and can be used as an additional anthropometric measure to predict risk factors for all cause mortality and morbidity.

**Corresponding address:** Dr Sowmya S, Lecturer, Department of Physiology, St John's Medical College, Bangalore-34, Email id: sowmyasharma01@gmail.com

### **Assessing parenting stress among parents of special children and normal children.**

**Sowmya. P, Preethi.B L, Jaisri.G**

P313

Department of Physiology, M.S Ramaiah Medical College.

**Background:** Parenting is a major form of stress, especially in children with special needs. However this stress has not been properly understood as evident from paucity of literature in this area.

**Objectives:** To evaluate and compare parenting stress among parents of special children and normal children.

**Methods:** Assessment of parenting stress using Sheldon Cohen Perceived Stress Scale questionnaire was conducted on parents of 40 special (study group) and 40 normal (control group) children aged between 5 and 12 years. The Questionnaire was provided to both parents, they were seated separately in order to avoid bias. Statistical analysis was done using unpaired t-test.

**Results:** The study group scored higher as compared to the control group with their means and standard deviations being (22.05+5.48) and (17.34+7.31) respectively. The statistical value of significance (p value) is 0.00145.

**Conclusions:** Present study showed that the parents of special children had significantly higher parenting stress levels as compared to the parents of normal children. It is important to address this stress as it could lead to impairments of overall quality of life in such parents.

### **Evaluation of *in vivo* antioxidant potential of *Amorphophallus campanulatus* against ethanol induced hepatotoxicity**

**Subhashree Basu, Moumita Das and Gouriprosad Datta**

P314

Department of Physiology, Rammohan College, 85A, Raja Rammohan Sarani, Kolkata: 700 009

**Aims:** The present study was aimed at evaluating the protective role of hydro-ethanolic extract of *Amorphophallus campanulatus* Roxb. (*EtAc*) tubers against ethanol induced hepatotoxicity.

**Objectives:** Hepatotoxicity was evaluated by measuring the levels of liver marker enzymes in serum, biomarkers of oxidative stress from tissue homogenates and morphological alterations in tissue sections through H-E staining.

**Methods:** Adult male wistar rats, weighing 150-200g, were randomly grouped (n=6) and treated with ethanol (1g/kg bw, i.p.), *EtAc* (250 mg/kg bw, i.p.), ethanol with *EtAc* (similar dose), and control (0.5 ml normal saline, i.p.) for 30 days.

**Results:** Ethanol administration significantly ( $p < 0.001$ ) elevated the levels of liver marker enzymes (AST, ALT, ALP), TBARS and consequently reduced the levels of total protein, GSH, along with the activity of SOD and CAT compared to control. Pre-treatment with *EtAc* significantly ( $p < 0.001$ ) restored the levels of above parameters towards normal. Histo-pathological studies also confirmed the hepatoprotective nature of the extract by preventing cellular damage caused in the only ethanol administered group.

**Conclusion:** The results of this study strongly indicate that *EtAc* has potent hepatoprotective action against ethanol induced oxidative damage probably by scavenging free radicals. Further investigation can lead to the development of phyto-medicines of therapeutic significance against oxidative stress.



**Corresponding address:** Subhashree Basu, Department of Physiology, Rammohan College, 85A, Raja Rammohan Sarani, Kolkata: 700009; Email: sreeatrmcollege@yahoo.co.in

## Effect of Dark Chocolates on P300 Cognitive Potential in Older Adults

P315

**Suhas.S.H.,and Suresh Y Bondade**

Dept. of physiology, JJM Medical College, Davanagere (Karnataka)

**Objective:** Certain compounds in chocolate are capable of asserting a psychoactive effect. As old age is associated with cognitive decline, there is a need to understand effects of chocolates on cognition in elderly people.

**Methods:** P300 cognitive potential was recorded in 30 healthy elderly individuals of age group 67 to 73 yrs by standard auditory 'oddball paradigm' on computerized evoked potential recorder (RMS EMG MK-2) using 10/20 system. Active electrode (Ag/AgCl electrodes) was placed at Cz with reference electrodes on the mastoid at A<sub>1</sub> and A<sub>2</sub> and the ground at Fz. The click stimuli of intensity 70dB included two types of tones, 1000 Hz (non-target tone) and 2000 Hz (target tone), were delivered binaurally through earphones at a rate of 1.1/s and subjects were supposed to count target tone. Subjects were made to eat one bar of dark chocolate every day for one month and P300 was recorded again. Statistical Analysis was done by paired "t" test.

**Results:** There was a significant decrease in latency ( $P < 0.05$ ) and statistically insignificant change in amplitude of P300 potential after one month of chocolate eating.

**Conclusion:** Eating dark chocolates has beneficial effects on cognition in elderly people, possible explanation being improved neurovascular coupling due to cocoa.

**Correspondence address:** Dr Suhas S H. Final Year Post graduate, Department of Physiology, JJM Medical College, Davanagere. Email : su\_mmc@yahoo.co.in

## A study of stress in medical students

P316

**Sujatha Talikoti, Manjunatha Aithala, and Sumangla Patil.**

**Introduction:** Stress can be defined both psychologically and biologically. It has become very common now a days especially amongst students. Stress is characterized by many psychological changes in medical students medical education is perceived as being stressful

**Aims and objectives:** To determine the prevalence of stress and its direct effect on anthropometric and physiological vital parameters before and after examination in undergraduate students [Age-18-25yrs].

**Methods:** Hundred and fifty [150] students from shri B M Patil medical college BLDE University Bijapur were included in the study. anthropometric parameters like Height[cm], Weight[kg], BMI[kg/m<sup>2</sup>] & Physiological parameters like Pulse rate, Blood pressure[systolic and diastolic] were recorded & the set of questionnaires given [ ZUNG SCALE questionnaires ]. The stress levels were determined according to their answers.

**Result:** There was no change in anthropometric parameters 1 week before and 3 weeks after examination. All the vital parameters were found higher 1 week prior to examination than after 3 weeks of examination [ $p < 0.001$ ]. Assessing by Zung scale observation, before 1 week examination stress level of 53.33% students were within normal range, where as 22% students were mildly depressed & 0.67% students were found mildly depressed.

**Discussion & Conclusion:** There is considerable number of stress producing changes in the vital parameters particularly amongst final year students of MBBS. A high level of stress may not only affect academic performance

but may also affect all aspects of health of students. The early identification of stress & discussion at gross root [individual] strata will not just help students to improve scholastically but will also help them to sustain adequate & descent level of health.

**Key-Words:** Stress, medical students, zung scale.

**Corresponding address:** Sujatha Talikoti,sujathapatil87@yahoo.com

## Relationship of peripheral median motor nerve conduction velocity to grip strength

P317

Sumit Garg<sup>1</sup>, Ramya CS<sup>2</sup>, Vinutha Shankar<sup>3</sup>, Karthiyane Kuty<sup>3</sup>

<sup>1</sup>Department of Physiology, Teerthanker Mahaveer Medical College & Research Center, Moradabad, U.P. E mail: sumitgargdr@gmail.com Phone number: 8171453201; <sup>2</sup>Department of Physiology, MVJ Medical College & Research Center, Bangalore;

<sup>3</sup>Department of Physiology, Sri Devaraj Urs Medical College, Kolar

**Aims and Objectives:** Hand grip dynamometry is the most accepted method for evaluating the grasp strength of hand. Median nerve is responsible for gross movements of the hand. Strength of hand is dependent on peripheral innervations. This study aims to correlate the median motor nerve conduction velocity with handgrip strength

**Materials and methods:** 60 apparently healthy males between 20 – 40 years of age, not involved in heavy physical work and with no history of diabetes or peripheral neuropathy were included in the study. Informed consent was taken from all subjects. Hand grip strength of all the subjects was assessed using hand grip dynamometer. Three trials were given to the subjects and maximum strength value was accepted. Median motor nerve conduction velocity of both hands was measured with RMS-EMG MARK II machine. Data was analysed using Pearson's Correlation.

**Results:** Mean age of study group was 26.91 + 8.26 years. There was a significant positive correlation between median motor nerve conduction velocity with handgrip strength with  $r = 0.502$  ( $p < 0.01$ ).

**Conclusion:** Hand grip strength may be a good clinical prognostic tool for determining median motor nerve integrity.

**Corresponding address:** Sumit Garg, Department of Physiology, Teerthanker Mahaveer Medical College & Research Center, Moradabad, U.P. E mail: sumitgargdr@gmail.com Phone number: 8171453201

## Effect of controlled deep breathing on psychomotor and higher functions in normal individuals

P318

Sunaina Soni\*, L.N.Joshi, Anjum Datta

**AIM:** To study the Effects of Controlled Deep Breathing on Psychomotor and Higher functions in normal individuals, both males and females.

**OBJECTIVES: (i)**,To record the readings of all the tests of Psychomotor and Higher functions before and after 6 weeks of Controlled deep breathing practice; **(ii)** To compare before readings with after readings. **(iii)** To compare before readings and after readings between males and females to know the gender difference.

**METHODS:** 100 normal healthy subjects (52 females and 48 males, age range- 18 to 25 years) participated in the study. Each subject acted as his or her own control. 6 weeks course of Controlled deep breathing i.e. 5 seconds of maximal inhalation followed by 5 seconds of maximal exhalation, once a day for 10 minutes 6 days a week was

arranged under my supervision. For evaluating Psychomotor and Higher functions. (i) Letter Cancellation Test (ii) Rapid fire arithmetic deviation test and (iii) Playing card test were conducted before and after 6 weeks of Controlled deep breathing practice.

**RESULTS:** Observations were analysed using Paired and Unpaired 't test'. After 6 weeks of Controlled deep breathing practice Letter cancellation test time significantly reduced ( $p < 0.001$ ), Rapid fire arithmetic deviation test score ( $p < 0.001$ ) and Playing card test score ( $p < 0.01$ ) significantly improved. Letter cancellation test score didn't show improvement. No significant gender difference was found except in Letter cancellation test time (females showed more reduction than males).

**CONCLUSION:** This study suggests that a short, simple breathing practice can be helpful in improving concentration, attention, memory, eye-hand coordination, mental calculation ability, sequential or linear learning etc. This may help to improve one's cognitive processes and if continued in adult and old age may also help to retard the process of cognitive decline that occurs with aging.

**Presenting Author** Name- SUNAINA SONI, MGM Institute of Health Sciences, Department Of Physiology, Kamothe, Navi Mumbai, Mumbai- 410209. E-mail id- soni.sunaina@ymail.com

## Evaluation of physical fitness index using Queens College step test among working women in Karnataka

P319

<sup>1</sup>Suneeta Kalasuramath, <sup>2</sup>Malay kumar, <sup>2</sup>VinodKumar C S

<sup>1</sup> Department of Physiology, <sup>2</sup> Department of Microbiology, S S Institute of Medical Sciences & research centre, NH-4, Bypass, Davangere, Karnataka, India.

**Aims:** Physical Fitness Index (PFI) is considered an essential and important parameter in the field of exercise physiology. A negative influence of anemia and iron deficiency (ID) exists on PFI in women.

**Objectives:** This study is set to evaluate QCT in field study and compare the physical fitness and cardio respiratory fitness in terms of maximum aerobic capacity ( $VO_2\max$ ) among the peri-urban women.

**Methods:** 600 apparently healthy women aged 18-40 years, working in cotton mill, Davangere, Karnataka were recruited by simple random sampling. 3 groups of 200 were evaluated (mild-moderate anemic, ID & control). PFI was determined by Queens College step test (QCT) and  $VO_2\max$  was calculated.

**Results:** A statistical significant value of PFI and  $VO_2\max$  score was observed in the anemic, ID groups and negative correlation with BMI, duration of the test ( $p < 0.05$ ).

**Conclusion:** Indian women frequently complain of early fatigue in the lower limb. Though difficult to complete the QCT, it still is a good indicator of PFI. Anemia & ID impair the delivery of oxygen to tissues and lead to a reduced  $VO_2\max$  and thus have impact on the physical activity.

**Corresponding address:** Dr Suneeta Kalasuramath, Associate Prof, Department of Microbiology, S S Institute of Medical Sciences & research centre, NH-4, Bypass, Davangere, Karnataka, India Email: sunivinu50@gmail.com Mobile: 09964402525

## **Influence of training on audio-visual reaction time in basketball players.**

P320

Sunil S Vernekar, Parvati P Patil, Jyothi S, S Gowdar

**Background:** Speed of movement and quick reactions are prized qualities in basketball players. Research has shown that speed can be enhanced by strengthening of muscles & training. Reaction time is the interval of time between presentation of stimulus and initiation of response. Factors influencing reaction time are sense organ involved, intensity of stimulus, general muscular tension, motivation, practice, fatigue and general state of health.

**Objective:** To assess the influence of exercise on Audio-Visual reaction time in basketball players of different training period and to compare reaction time with controls.

**Methodology: Design:** Cross-sectional study. **Setting:** Department of Physiology, JNMC, Belgaum. 35 basketball players aged between 16 to 26 yrs were recruited & divided into two groups depending on number of years of basketball training (Group A  $\leq 3$  years of training and group B  $> 3$  years of training). For comparison 35 age & sex matched students were used as controls. Audio-Visual Reaction time was done by using audio-visual reaction time analyzer (Anandagencies, Pune). Statistical analysis involved quantitative variables summarized through mean and standard deviation. Difference between mean of the two groups was tested using Student unpaired 't' test, where significance of p-value was  $< 0.05$ .

**Results:** In the present study auditory & visual reaction time were significantly lesser in group B than in group A and the players had significantly lesser reaction time compared to controls.

**Conclusion:** Physical training and duration of exercise is of major importance in the adaptations of nervous system. Trained basketball players have shown better reaction time which determines the quickness of the players which is very essential for better performance in the game.

**Corresponding Address:** Dr Sunil S Vernekar, Plot-4, Ward-44, CCB- 318, Opposite District Training Institute, Sangameshwar Nagar, Belgaum- 590010, Karnataka. **E-mail:** drsunilsvernekar@gmail.com

## **A comparison of response to the oral glucose tolerance test in Indian males with high and normal body fat**

P321

Sunitha Priya A K, Kishor Bhat, Anura V Kurpad

Department of Physiology, St. John's Medical College, Bangalore, E mail: sunithageorge138@gmail.com

**Aim:** To examine the difference in response of Blood Insulin, C-peptide and Glucose levels during an Oral Glucose tolerance test (OGTT) at different time points following glucose load in normal and high fat Indian males.

**Methods:** Otherwise clinically normal Indian males of age group 21-40 years (n=10) with body fat  $< 20\%$  and  $> 35\%$  were studied. Body fat was measured using DXA scan. An OGTT was performed with 1 g of dextrose per kg body weight and Blood Glucose, Insulin, and C-peptide levels were measured at -15, 10, 20, 30, 60, 90, and 120 minutes following glucose ingestion.

**Result:** Plasma glucose and insulin levels were not different between the groups at baseline and 120 minutes. HOMA-IR was not significantly different. However, using C-peptide, the high fat group had significantly higher HOMA-IR (0.86 vs. 1.94). In addition, the Mann-Whitney test showed significant difference ( $p < 0.05$ ) between the 2 groups for C-peptide at basal and 120 min, while for insulin there were significant differences at 60 min. There was no significant variation at other time points.

**Conclusion:** C-peptide has a potentially more useful role in delineating differences between otherwise normal groups of high and low fat individuals. Significant changes in plasma C-peptide rather than insulin and glucose levels between the two groups at basal and 120 minutes suggest that C-peptide measurements might be useful in assessing early insulin resistance.

### Effect of Tobacco smoking on P300 Event related potential

P322

Sunitha. M.<sup>1</sup>, S.V Brid<sup>2</sup>, Suhas<sup>3</sup>, Afrin<sup>4</sup>

Department of Physiology, JJM Medical college, Davangere

**Background:** Identification of effect of smoking on P300 Event related potential which in turn represents basic characteristics of neurocognitive functioning may help to elucidate the mechanism of tobacco dependence.

**Objectives :** To study and compare the effect of smoking on auditory P300 in chronic heavy smokers (Group I) & new beginners of smoking (Group II) before and after immediate cigarette smoking.

**Materials & Methods :** Auditory P300 amplitude and latency were recorded in 50 Group I and 50 Group II male individuals in age group of 25 to 35 years before and after immediate smoking. 30 age and sex matched non smokers were taken as controls.

**Results :** Group I had P300 of lower amplitude and longer latency ( $p < 0.001$ ) compared to Group II and controls. Significantly reduced latency and increased amplitude of P300 ( $p < 0.05$ ) was noticed in Group II after immediate smoking compared to Group I. In group II after smoking no significant change was noticed in P300 though slight increase in amplitude was seen ( $p > 0.05$ )

**Conclusion:** Chronic heavy smoking causes decline in cognitive function. Reduced P300 may be a marker of risk for nicotine dependence.

**Key words :** Auditory ERP; P300; Tobacco smoking.

**Corresponding Address :** Dr. Sunitha. M, Assistant Professor in Physiology, JJM Medical College, Davangere, Karnataka, **Email address:** drsunitham9@gmail.com

### Development of cost-effective, portable and sensitive Bioimpedance phase-angle monitoring device

P323

Suparna Ghosh<sup>1</sup> and K.N Maruthy<sup>2</sup>

<sup>1</sup>Assistant Professor, Department of Physiology, RMC&RC, UP, India; <sup>2</sup>Professor, Department of Physiology, NMC, Nellore, Andhra Pradesh, India

The principle of bioimpedance has been introduced in 1950s. The availability of acute phase sensitive electronics has increased interest in the use of bioelectric impedance to stimulate human body compositions in the field of nutrition, biology, physiology, and sport medicine and clinical medicine. Lower phase angles appear to be consistent with low reactance and equals either cell death or breakdown of the cell membrane. The cost of the instrument which is available in the market is high though it is sensitive and accurate. The aim of the study is to develop a portable, accurate, sensitive and cost-effective bioimpedance phase-angle monitoring device. Bioelectric resistance is the pure opposition of a biological conductor to the flow of an alternating electric (AC) current whereas reactance is the resistive effect due to capacitance produced by tissue interfaces and the cell membrane. Capacitance, or the storage of electric charge by a condenser, causes the current lag behind the voltage creating phase shift. This shift is quantified geometrically as the angular transformation of the ratio of

the reactance ( $X_c$ ) to the resistance $\otimes$  or the phase angle ( $\emptyset$ ). The instrument is build using two blocks, the first circuit which generates sine wave oscillations at 50 KHz frequency and the second one measure the phase angle. It has standard 4 electrodes out of which two are used for injecting current (<1 milliampere) and two are used to measure the phase angle. Two injecting electrodes and two measuring electrodes were used assuming the body is symmetrical bilaterally. The phase angle is directly displayed in a LCD monitor in degrees. The cost for the development is around Rs-10,000/-.

### **Estimation of Lipid Profile, Body Fat Percentage and Lean Body Mass in Hypothyroid Patients.**

P324

**Supriya ohal., R.A. Bhagchandani., M.S.Phatak.**

Department of Physiology, Indira Gandhi Government Medical College, Nagpur.

**Objectives:** Hypothyroidism is commonly associated with altered lipid metabolism and body composition parameters thus the present study was conducted to compare the lipid profile, body fat percentage and lean body mass percentage in hypothyroid and control groups.

**Method:** It is case control study. 40 female subjects in the age group 20-60 years were taken after detailed history and thyroid profile estimation. They were divided into groups. Group A (n=20) hypothyroid females and Group B (n=20) age sex matched controls. In Lipid profile total cholesterol(TC), triglycerides(TG),high density lipoprotein cholesterol(HDL-C) measured by enzymatic method while very low density lipoprotein cholesterol(VLDL-C) and low density lipoprotein cholesterol(LDL-C) calculated by Friedwald's formula. Body composition was determined by Bioelectrical Impedance Analyser.

**Results:** Lipid profile estimation revealed significantly high level of TC and LDL-C in hypothyroid patients as compared to controls( $p<0.05$ ) and there was no significant change in Level of TG, VLDL-C and HDL-C. Bioelectrical Impedance Analysis showed significant increase in body fat percentage ( $p<0.05$ ) and significant decrease in lean body mass( $p<0.05$ ) in hypothyroid group as compared to control group.

**Conclusions:** Hypothyroidism associated with changes in the body composition and unfavorable effect on lipid profile enhancing the risk for development of atherosclerosis and coronary artery diseases necessitating medical attention.

### **Study of Lung functions in cotton mill workers**

P325

**Surekha Vaidya, Usha Patil , Arati Kalebag**

B.V.D.U.Medical College Sangli

**Aim:** To study lung functions (FVC,FEV1&PEFR) in cotton mill workers.

**Objective:** To Study the incidence of Byssinosis which affects various lung functions and to correlate the duration of exposure to cotton dust & its effects on lung functions.

**Material & Method:** 600 cotton mill workers from Sangola, District Solapur, Maharashtra state were taken as subjects. Their FVC, FEV1 &PEFR was recorded by Benedict Roth's Spirometer & peak flow expirometer respectively. The workers were divided into 5 groups as per their department. Subgroups were formed according to the number of years of service in each department.

**Results:** All the groups showed significant decrease in FVC,FEV1&PEFR. All lung functions showed deterioration with prolonged exposure.

**Conclusion:** Exposure to cotton dust, flax, hemp dust causes byssinosis which causes significant reduction in lung functions. To prevent the permanent lung damage, the preventive measures should be strictly followed.

**Keywords-**FVC(Forced Vital Capacity), PEFR (Peak Expiratory Flow Rate), FEV1 (Forced Vital Capacity during 1<sup>st</sup> second)

### **A study of patient compliance in a city of Haryana state in India.**

P326

**Sushila Godara, Jyoti Kaushal, and MC Gupta.**

Department of Pharmacology, Pt. B. D Sharma Post Graduate Institute of Medical Sciences, Rohtak, India Email ID: drgodarasushila@gmail.com

**Objectives:** Response to any treatment is related to the dose and schedule of the therapy. Hence, noncompliance reduces treatment benefits. So, aim of the study was to assess the reasons for patient compliance in Rohtak city of Haryana state.

**Methods:** A detailed questionnaire was designed to assess the patient compliance. One hundred patients of either sex irrespective of their ages, of different diagnostic conditions who were already on prescribed medication at least for one week were assessed in Rohtak city of Haryana state.

**Results:** There was no significant difference in compliance according to age, sex and marital status but compliance was better observed in educated patients as compared to uneducated i.e. 93% versus 68%. Compliance was better observed in acute diseases (87%) than chronic diseases (48%). 75% of the patients complied with the instructions whereas 25% were poor compliant (non-compliant 22%; over compliant 3%). The most commonly cited reasons for noncompliance were: lack of efficacy-7%, side effects-5%, not able to bear the expenses 5%, unpleasant taste-3%, complex schedule-1%, not liking the pharmaceutical preparation (tablet, liquid, injection)-1%.

**Conclusion:** The study shows that patient compliance is not significantly related to sociodemographic factors. The common reasons of non compliance are lack of education, lack of efficacy, complex schedules, side effects and bad taste of drugs.

**Corresponding address:** Sushila Godara, Department of Pharmacology, Pt. B. D Sharma Post Graduate Institute of Medical Sciences, Rohtak, India Email ID: drgodarasushila@gmail.com

### **Electrophysiological assessment of cognitive and muscle function in COPD patients.**

P327

**Sushma Sood, Ankur Agrawal, Rajesh Gupta.**

**Aim & objective:** To study the Electromyography (EMG), Event related potential (ERP) P 300 and ventilatory functions in COPD patients as an electrophysiological determinant of muscular and cognitive dysfunction.

**Methods:** EMG of quadriceps & ERP-300 was recorded in 100 male subjects (50 diagnosed COPD patients & 50 age matched controls) of age  $\geq 40$  years on RMS EMG MK@ equipment and ventilatory functions on PC based RMS spirometer.

**Result:** All patients had airflow limitation (postbronchodilator  $FEV_1 < 80\%$  of predicted with  $FEV_1/FVC < 70\%$ . EMG values of quadriceps muscle (recruitment & amplitude) were significantly decreased in COPD patients as compared to controls. Amplitude & recruitment of rectus femoris & vastus medialis showed a negative correlation with the pack years and a statistically significant correlation with severity of COPD ( $FEV_1$ ). P300 latency was significantly high and amplitude low in patients as compared to controls. Amplitude of P300 was significantly correlated with the severity of COPD i.e.  $FEV_1/FVC$ .

**Conclusion:** Electrophysiological tests are useful in timely assessment of systemic manifestation of COPD. So many factors are also involved in systemic manifestation of COPD which need to be further explored. Thus we can say that COPD is not only limited to pulmonary compartment rather it is a systemic disorder.

**Corresponding address:** Dr. Sushma Sood, Sr. Professor & HOD, Dept. of Physiology, Pt. B D Sharma PGIMS, Rohtak- 124001, Haryana.;**Email I.D.**-sushma.sood@yahoo.com

### **Faculty perceptions of the strengths, weaknesses and future prospects of the current medical undergraduate experimental physiology curriculum in Gujarat**

P328

**Swapnil Paralikar, Chinmay Shah, Pravin Rabari**

Gujarat Medical Education & Research Society(GMERS) Medical College Gotri, Gotri Road, Vadodara

**Introduction:** Over the past several years, an opinion has emerged in India that the current practical curricula in medical schools fail to meet many of the objectives for which they were instituted. Hence, this study has assessed the perception of physiology faculty members regarding the current experimental physiology curriculum in one Indian state, Gujarat.

**Methodology:** A questionnaire based survey, which was pre-validated in 2 colleges, was sent in sealed covers to physiology departments of 14 out of the 16 medical colleges in Gujarat. Responses were obtained from 13 colleges, and about 90% (110) of the faculty members responded.

**Results:** The faculty were of the opinion that many of the topics currently taught in experimental physiology ( amphibian nerve-muscle and heart muscle experiments) (9/15 topics) were outdated and clinically irrelevant. Therefore, the faculty advocated that duration of teaching time devoted to some of these topics should be reduced and topics with clinical relevance should be introduced at the undergraduate level. The faculty also felt that more emphasis should be laid on highlighting the clinical aspect related to each concept taught in experimental physiology . Moreover, a majority of faculty members(>70%) were in favour of replacing the current practice in Gujarat of teaching experimental physiology only by explanation of graphs obtained from experiments conducted in the previous years, with computer assisted learning in small groups.

**Conclusions:** Thus, the faculty members suggested that there is an imperative need to implement radical changes in the experimental physiology curriculum which should be in consonance with patient care for the doctors of tomorrow to render better health care services.

**Key Words:** faculty, curriculum, needs assessment, experimental physiology

**Corresponding Author:** Institutional Address With Mail Id: Gujarat Medical Education & Research Society(GMERS) Medical College Gotri, Gotri Road, Vadodara-390 021. E-mail : deanmcgv@gmail.com

### **Effect of yoga on anxiety levels in working women**

P329

**Swati.R.Gawali,Dhule S.S., Surdi A.D. and Handergulle S.M.**

JR-II, SRTR GMC,Ambajogai,Dist.Beed-Maharashtra

**Aims and Objectives:** In this modern era stress has become an integral part of human life. Stress is considered to be any condition which results in perturbation of the body's homeostasis. Today, women are constantly under stress to balance between home and work place. Yoga aims at an integrated and harmonious development of all the potentialities of man. However, to put yoga on a firm scientific pedestal, we planned to undertake a study of effect of yoga on anxiety score before and after yoga training in apparently healthy working women.



**Materials and Methods:** The study was carried out in 35 apparently healthy working women aged between 25-50 years who attended two months of yoga training. Spielberger's state and trait anxiety scale was used to evaluate anxiety levels before and after yoga training.

**Results:** Our study showed a statistically significant difference in total anxiety score before and after yoga training by applying paired 't' test.

**Conclusion:** We concluded that regular practice of yoga in day to day life reduces anxiety levels and improves subjective feeling of wellbeing. Our study thus helps to popularize yoga among working women.

**Keywords:** Stress, yoga, anxiety scale

**Corresponding address:** Swati.R.Gawali, JR-II, SRTR GMC, Ambajogai, Dist. Beed-Maharashtra, Email: sgawali66@gmail.com

### Evaluation of antianxiety effect of xanthine oxidase inhibitors in albino mice

Swetha E S, Sathisha Aithal, Ayesha Rubina

P330

Postgraduate student, Department of Pharmacology, SSIMSRC, Davangere 577005.

**Objective:** To evaluate the antianxiety activity of Allopurinol 39mg/kg and Febuxostat 15.6mg/kg in comparison with control, Diazepam 0.5mg/kg and with Fluoxetine 10mg/kg.

**Methods:** Elevated plus maze: Pre-treated animals were placed individually for 5mins in the maze. The number of entries into the open and closed arm, time spent in each arm and the no. of entries in both the arms were noted.

**Social interaction test-** Pre-treated mice were isolated for 1 hour before the test. In the test arena, the mice were observed for cumulative time spent in social interaction for a period of 10mins. All the results are expressed as Mean  $\pm$  SEM. Data are analyzed by analysis of ANOVA using SPSS20.  $P < 0.05$  was considered as significant.

**Results: Elevated plus maze-** Administration of Allopurinol and Febuxostat significantly increased the time spent in open arms,  $p < 0.001$  and  $p < 0.018$  respectively in comparison with control. **Social interaction test-** Administration of Allopurinol and Febuxostat significantly increased the time spent in social interaction,  $p < 0.001$  as compared to control.

**Conclusion:** Both Allopurinol and Febuxostat possessed significant anti-anxiety effects.

**Corresponding address:** Dr. Swetha E S, Postgraduate student, Department of Pharmacology, SSIMSRC, Davangere 577005. Email id: shwetha.es@gmail.com

### Is the non fluorescent fraction of *Cleistanthus collinus* toxic?

P331

Swetha Raman, Soosai Manickam, Sathya Subramani, Department: Physiology, Christian Medical College

**Background:** *Cleistanthus Collinus* (Oduvanthazhai) is a poisonous shrub and our larger aim is to delineate the toxic compounds in it. Excluding non-toxic fractions and focusing on just the toxic fractions is one of our approaches in defining the toxicity of the plant. All fluorescent fractions in the aqueous extract could be sequestered by partitioning it with chloroform. Its known toxins, Cleistanthin A and B which are fluorescent, are toxic as seen in previous studies. The aim here was to assess the toxicity of its non fluorescent fraction (NFF) of the boiled extract.

**Objectives:** (a) To assess if the non-fluorescent fraction of *C.collinus* causes death in within 8 hours after intraperitoneal administration.; (b) To monitor arterial blood gases, electrolytes, respiration, ECG, blood pressure, urine pH in test animals and compare it with controls.

**Methods:** Carotid artery of anaesthetized wistar rats was cannulated. Blood pressure, ECG and respiratory rate were recorded using CMC data acquisition system. Regular arterial samples were taken to estimate electrolytes and blood gases. If the pre intervention blood parameters satisfied published inclusion criteria, the animals were randomized into test (NFF-Oduvan) or control (Drumstick-processed similarly) groups and received the respective extracts intraperitoneally at a dose of 20 mg/100gBW.

**Results & Conclusion:** 20% mortality in test and 0% in controls (n=5 each) was recorded. Normal electrolyte levels without altered pH was observed (both). Respiration and intra arterial pressure remained normal (both), but associated with a progressive tachycardia in test (p=0.00). Peculiarly, there was hyperoxia (p=0.00) with hypercapnia (both). The blood gases did not seem to satisfy the limits of the alveolar gas equation.

To conclude, NFF fraction seemed to be non-toxic, which has to be substantiated by testing for a longer period with a larger sample size. For clinical relevance, oral gavaging must be the mode of administration rather than intraperitoneal.

## Pharmacovigilance is essential - Safety comes first

P332

Swetha Sridhar, Shwetha.H, Shwetha.A.M

M S Ramaiah Medical College, Bangalore

Adverse drug reactions are considered one among the leading causes of morbidity and mortality adding to spiraling costs of medical treatment. Pharmacovigilance is the science and activities that deals with detection, evaluation, understanding and prevention of adverse drug reactions or any other drug related problems.

Large, diversified genetic pool of patients, increasing number of new drug approvals, self-medication, alternative systems of medicine and lack of awareness and our own data on adverse drug reactions calls for the need of Pharmacovigilance in India. Unfortunately, inspite of presence of well organized centers for drug monitoring in the country, the number of reports sent annually is dismal.

This warrants an urgent need to reinforce pharmacovigilance activities through continuing medical education and workshops to create awareness among clinicians and public education on dangerous outcomes of self medication. Need of the hour is to emphasize on effective reporting at all levels of patient care and to ensure that the benefits of use of medicine outweighs the risks and thus safeguard the health of the Indian population.

## Role of vitamin D in obesity and type 2 diabetes mellitus among elderly males

P333

Tarun Kumar, Ashok Sharan, Manish Kumar and Sunita

IGIMS Medical College, Patna, Email ID: omtarun\_2004@yahoo.com

**Objective:** The study was conducted to assess the role of vitamin D in glucose metabolism and fat content of the body among elderly males.

**Methods:** The participants were 240 elderly males from the age group of 40 to 50 years divided into three groups on the basis of their Body Mass Index (BMI). Normal body weight was defined as BMI < 25 kg/m<sup>2</sup>, overweight as 25 < BMI < 30 kg/m<sup>2</sup> and obesity as BMI > 30 kg/m<sup>2</sup>. Fasting blood glucose level determined by using commercially

available kits and 75 grams Oral Glucose Tolerance (OGT) test was performed. Body fat content was calculated by body fat analyzer. Serum level of vitamin D was measured by immunoassay kits (Immunodiagnostic Kits System Ltd, UK).

**Results:** The results showed that 68.33% of the men were overweight or obese with body fat content 22-29%. Fasting blood glucose level was > 120mg/dl among 55% and Oral Glucose Tolerance (OGT) test was positive among 35% of the men. Serum vitamin D level was <75nmol/liter and Insulin sensitivity index was decreased ( $P<0.01$ ).

**Conclusion:** The study suggests that vitamin D deficiency plays very important role in development of insulin resistance leading to increased body fat content and diabetes mellitus type 2.

### Comparison of sympathetic nervous activity amongst male and female patients of bronchial asthma

P334

Thangjam Pricila Devi<sup>1</sup>, Th. Shantikumar Singh<sup>2</sup>, W. Kanan<sup>3</sup>, W. Asoka Singh<sup>4</sup>

Department of Physiology, RIMS Imphal -795004; E-mail id: thangjam.pricila@yahoo.com

**Objective:** Testing sympathetic division of autonomic nervous system in Bronchial asthma and comparing the results between male and female asthmatic patients.

**Method:** This study was carried out in the Departments of Physiology and Respiratory Medicine, RIMS Imphal. 38 asthmatic patients were taken comprising of 19 males and 19 females. Lung function was studied by computerized spirometer. Three consecutive spirometric recordings were performed and the best result among three (3) readings was taken. Sympathetic division of autonomic nervous system was tested by measuring blood pressure response to sustained hand grip for 2 minutes and to standing from supine posture for 3 minutes.

**Results:** Mean rise in diastolic blood pressure on sustained hand grip for 2 minutes was 19.15 mmHg in male asthmatics whereas it was 12.84 mmHg in female asthmatics which was statistically significant. Mean rise in diastolic blood pressure on standing from supine posture for 1 minute was 12.84 mm Hg in male asthmatics with female asthmatics having mean rise of 8.52 mmHg which was also statistically significant.

**Conclusion:** Diastolic blood pressure rise on sustained hand grip and on standing from supine posture was greater in male asthmatic patients as compared to female asthmatics.

**Correspondence address:** Thangjam Pricila Devi, 1. Senior Resident, Department of Physiology, RIMS, Imphal; 2. Retd. Professor and Head, Department of Physiology, RIMS, Imphal; 3. Professor, Department of Physiology, RIMS, Imphal; 4. Professor, Department of Respiratory Medicine, RIMS, Imphal

### Immediate effect of nostril breathing on memory performance in adolescent population by using digit span test.

P335

Thenmozhi.S, Neelambikai.N

Department of Physiology, Coimbatore Medical College, Coimbatore

**Background:** The nasal cycle is a physiological phenomenon of alternating partial congestion and decongestion of mucosa of nasal cavity in humans which results in the alteration in the patency of nostril for every 2 to 8 hours that leads to alternate periodic breathing functions. Researchers have found that even 20 minutes of unilateral forced nostril breathing cause immediate effect on the memory performance by activation of the contralateral cerebral hemisphere.

**Aim :** To study the immediate effect of right nostril breathing(RNB), alternate nostril breathing(ANB) and left nostril breathing(LNB) on the memory performance in adolescent right handed subjects by using digit span forward and digit span backwards test.

**Materials & Methods: Study Group:** 30 MBBS students (right handed) within the age group of 18 – 20 years of both the sex were taken for the study.

**Methodology:** Initially the memory performance was assessed by using digit span test. Digit forward test(DSF) contains 10 items (6 items for easy task and 4 items for difficult task). Each correct answer was scored 1 with total score of 10. The sequence of recall in DSF is in forward order. Similar procedure was undertaken for digit span backward test(DSB) also, but the sequence of Recall of numerical is in reverse order. After this three different breathing techniques were demonstrated to the students, it was then practiced for one week. Then the tests were repeated to check for the improvement in memory performance. The scores of digit span test for different nostril breathing were tabulated and they are statistically analyzed by unpaired-t- test.

**Results:** In the present study, the analysis of data shows that the memory performance was increased after right nostril breathing, with the following P values.

**Conclusion:** The present study shows that among the different types of nostril breathing, right nostril breathing increases the activation of left cerebral hemisphere and thereby increases the memory performance.

## Prevalence of elevated blood pressure and associated factors among undergraduate medical students

P336

<sup>1</sup>Thilip Kumar G., <sup>1</sup>Prabhavathi K, <sup>1,2</sup>Ganeshkumar P, <sup>1</sup>Saravanan A

<sup>1</sup>Department of Physiology; <sup>2</sup>Department of Community Medicine, SRM Medical College, Hospital & Research Centre, Kattankulathur, Chennai-603203

**Aims and objectives:** To assess the prevalence of elevated blood pressure and the factors associated with elevated blood pressure.

**Methodology:** A cross sectional study was conducted among 137 medical students using digital BP monitor and also a questionnaire was obtained to assess the associated factors and other demographic details. Data was analyzed with SPSS software and results were demonstrated using descriptive tables where chi-square test was used.

**Result:** The prevalence of elevated blood pressure (pre-hypertension & hypertension) as per JNC 7 criteria, among the medical students was 27.3%. Most of the students (86%) were belonging to upper socio-economic status as per Kuppaswamy's classification. Proportion of students with the good satisfactory score on knowledge, attitude and practice (KAP) among prevention of hypertension were seemed to be low among those with elevated blood pressure. Among 26 obese students, 9(34.6%) were having elevated blood pressure and this seems to be statistically significant.

**Conclusion:** The study shows significant proportion of individuals with elevated blood pressure at a younger age, associated with risk factors such as obesity and poor KAP score. Hypertension being a disease of ice berg goes unnoticed leading to chronic disease, therefore identification at the earliest can curb the disease.

**Corresponding address:** Mr.G.Thilip Kumar, Tutor, Dept. of Physiology, SRM Medical College Hospital & Research Center, Kattankulathur, Potheri 603 203 E-mail: physiothilip08@gmail.com Ph: 9003012360.

## Comparison of body fat estimates obtained from skin fold thickness and bioelectrical impedance analysis With Dual-Energy X-Ray Absorptiometry in South Indian children aged 6-9 years

P337

Tinju James, Rebecca Kuriyan, Tony Raj

Department of Physiology, St. John's Medical College, Bangalore, E mail: tinjuabel@gmail.com

**Objectives:** To compare the body fat estimated from two field methods with dual-energy x-ray absorptiometry (DXA) in South Indian Children aged 6-9 yrs.

**Methods:** Apparently healthy children (26 males & 20 females) were recruited from urban schools in Bangalore. The study was conducted at St. John's Medical College, Bangalore. Body composition measurements of skin fold technique (SFT), bioelectrical impedance analysis (BIA using Tanita SC-240) and dual-energy x-ray absorptiometry (DXA) were performed on the children using standard procedures. Predicted percentage body fat (%BF), fat-free mass (FFM) and fat mass (FM) were derived from skin fold equations and bioelectrical impedance analysis (BIA) indices.

**Results:** The mean %BF obtained from DEXA, BIA and SFT were  $23.94 \pm 6.67$ ,  $18.5 \pm 4.06$  and  $19.88 \pm 4.48$  respectively. Compared with DXA, %BF from BIA was underestimated by  $5.42 \pm 4.12$  and %BF from SFT was underestimated by  $4.06 \pm 5.74$ . The % of body fat estimated using BIA was significantly correlated with DXA ( $r = 0.8$ ,  $p < 0.05$ ), but to a lesser degree with skin folds ( $r = 0.51$ ,  $p < 0.03$ ).

**Conclusion:** Although SFT & BIA (Tanita SC-240) can be used for the estimation of body fat for field studies, these estimates were lower compared to DXA in South Indian children aged 6-9 years.

## Role of bioelectric impedance phase angle in tongue carcinoma- A hospital based study

Tyagi Ruchi<sup>1</sup>, Mishra Shashank<sup>2</sup>; Gaur Naveen<sup>1</sup>; Misra Rajesh<sup>1</sup> Kumar Mukesh<sup>1</sup>, Jain Atul<sup>2</sup>

P338

<sup>1</sup>Department of Physiology <sup>2</sup> Department of Surgery, Subharti Medical College, Meerut

**Objective:** To compare the Phase Angle between patients of tongue Carcinoma and their matched control with the help of Bioelectrical Impedance Analyzer.

**Introduction:** The incidence and mortality from squamous cell carcinoma tongue have increased during recent trends. Much effort has been made to predict tumor behavior but we still lack specific prognostic indicators. Malignancy exhibits numerous abnormalities in cell as well as cell membrane which are reflected in altered tissue electrical properties. Bioelectric Impedance Analysis affords an emerging opportunity to improve prognosis because of its ability to non invasively detect changes in tissue electrical properties.

**Material & Methods:** After taking clearance from ethical committee a total of 37 (males) cases of histologically proven squamous cell carcinoma tongue were included from the surgery IPD, department of surgery, Subharti Medical college, Meerut. BODY STAT QUAD SCAN 4000 was used to measure phase angle.

**Result:** Unpaired "t" test with Welch's correction was applied. In control group Phase angle showed a mean of  $5.659 \pm 0.00713$  while in test group it showed a mean value of  $3.730 \pm 0.05680$ . P value showed a significant difference ( $p < 0.0001$ ). The smaller the Phase Angle values higher was the TNM staging.

**Conclusion:** This study demonstrated that phase angle is a strong predictor of tongue cancer and differed significantly between the two groups.

**Corresponding address:** Dr. Ruchi Tyagi, Asstt. Professor, Department of Physiology, Subharti Medical College, Swami Vivekanad University, Meerut. Email: dr\_ruchi\_tyagi@yahoo.com

### **Attitude of first year MBBS students about the different teaching aids used in physiology**

**Ujwala N. Jagdale, Shilpa M, Ranganath M.D**

P339

**Aim:** To know the students preference regarding use of various audio- visual aids.

**Objectives:** To determine medical students perception of different visual aids like Blackboard (BB), overhead projector transparencies (OHPT) and power point presentations (PPT) and to generate recommendation for their optimum use.

**Methods:** The study group comprised of 100 students of 1<sup>st</sup> year MBBS (2012 -2013 batch) who had completed six months of regular classes in Physiology in RRMCH, Bangalore and were exposed to different teaching aids like BB, OHPT and PPT's. A questionnaire was given to them. Results were analyzed by basic descriptive statistical analysis.

**Results:** To understand the topic better 44% students preferred BB teaching along with PPT and 31% students preferred only BB teaching. 37% students preferred BB along with PPT as the mode which provides a good learning experience and alarmingly none felt that OHPT provided the same. 42% students felt that BB along with PPT was the most interesting and interactive visual aid. 77% students favored seminars to be included in the curriculum.

**Conclusion:** The students preferred BB along with PPT and they favored seminars in their course of study. We must try to bring about that change in the curriculum.

**Key words:** Blackboard teaching, Power point, Visual Aids

### **Effect of occupational exposure to Rice Husk Dust on FEV1 and FVC.**

P340

**UMA R\*, RAJESHWARI L\*\***

\*Second year Post Graduate Student \*\*Associate Professor, Department of Physiology, JSS Medical College, Mysore (A constituent college of JSS University, Mysore)

**Aim:** Aim to study the pulmonary functions among rice mill workers

**Objective of the study:** To study the effect of rice husk dust on FEV1 and FVC.

**Materials and methods:** The study was conducted on 30 malerice mill workeres and 30 healthy adult individuals of age group 20 to 40 yrs selected from JSS medical college Mysore. Unpaired t-test was used to test the significance of difference between mean values of subject and control.

**Results:** FEV1 and FVC was significantly lower in male rice mill workeres compared to healthy individuals males. (FEV1:  $2.33 \pm 0.73$  vs  $3.25 \pm 0.46$ , FVC :  $2.62 \pm 0.84$  vs  $3.47 \pm 0.52$ , FEV1/FVC :  $88.98 \pm 4.3173$  vs  $93.75 \pm 2.66$   $P < 0.0001$ )

**Conclusion:** This study shows, rice husk dust significantly affects lung functions and measures have to be taken to prevent irreversible pulmonary pathology.

## Daytime sleepiness and quality of sleep in Punjab diabetic population

P341

Upneet Bedi, Gaurav Mittal and Rajiv Arora

Department of Physiology, Department of Medicine, Punjab Institute of Medical Sciences Hospital and Medical College, Jalandhar, Punjab

**Aims and Objective:** The study was carried out to examine the daytime sleepiness and quality of sleep in diabetic population sample.

**Materials:** Total number of 201 T2DM patients, 101 males and 100 females aged above 20years of age were taken from medicine outpatient department.

**Method:** To study included information about soci-demographic characteristics and physical parameters. Epworth sleepiness score (ESS) and the Pittsburgh sleep quality index (PSQI) were used to study daytime sleepiness and sleep quality.

**Results:** ESS revealed that 35% of the diabetic patients were very sleepy during the daytime with 40% men and 50% women. PSQI showed that sleep loss was high in 35% diabetic patients. Obesity was significantly higher in diabetic women who had higher chances of daytime sleepiness than men ( $P < 0.00005$ ). Physical activity was significantly lower in diabetic women with poor sleep compared to men ( $P < 0.001$ ).

**Conclusion:** This study finding showed that loss of sleep quality and daytime sleepiness was present in diabetic population and obesity and lack of physical activity had an important contribution to it.

**Corresponding address:** Dr Upneet Bedi, Assistant Professor, Department of Physiology, PIMS, Jalandhar City, Punjab. Upneetbedi@rediffmail.com

## EFFECT OF MUSIC ON THE HEART RATE VARIABILITY IN HEALTHY MALES – A PILOT STUDY

USHA G.SHENOY, KARTHIYANEE KUTTY, JAGADAMBA.A, VINUTHA SHANKAR

P342

Dept. of Physiology, Sri Devaraj Urs Medical College , Tamaka, Kolar, Karnataka; Email ushaudupi@gmail.com.

**INTRODUCTION:** Music may not only improve quality of life but also effect changes in heart rate (HR) and heart rate variability (HRV). It is a powerful relaxation tool. Music therapy is used in reducing anxiety levels, lowering the blood pressure, heart rate and heart rate variability. HRV is a well-known a non-invasive tool used to measure, assess and provide information about an individual's state of health.

**AIM AND OBJECTIVE:** The purpose of the pilot study is to assess the effect of music on heart rate variability in healthy young males.

**METHODOLOGY:** 11 students in the age group of 17-20 years who volunteered for the study were selected. Baseline Heart rate variability was recorded for a period of 5 min using AD instruments. Parameters obtained were SDNN, RMSSD, NN50%, LF, HF and LF/HF RATIO. Later Hip hop and Classical music were played for 5 min and heart rate variability was recorded for same parameters.

**RESULTS:** There was a significant increase in the heart rate with Hiphop music when compared to baseline and classical music, but there was no significant change in the heart rate variability.

**CONCLUSION :-** To observe the sympathetic dominance in Hiphop music a larger sample size is required.

## Effects of Pranayama and Aerobic Exercise on anxiety status of Medical Students

Usha Patil, Surekha Vaidya, Smita Shinde, Meena Parekh, Supriya Divekar and Ruikar

P343

B.V.D.U. Medical College, Sangli. Email: Email- drushapatil1212@gmail.com

**Aim:** To find out the effects of Pranayama and Aerobic Exercise on anxiety status of Medical Students and to compare their effects.

**Objectives-** First year medical students are worse psychosocially at the end of the year than, when they enrolled. They experience anxiety before confronting examinations and presentations. Present study is to find out whether regular practice of Pranayama or Aerobic Exercise can relieve anxiety and improve their academic performance.

**Methods-** Total 120 students participated in the study. 40 for Pranayama, 40 for Aerobics and 40 for control. State Trait anxiety inventory and WHO well being index were used before and after training. Students were doing pranayama and aerobic exercise everyday morning half an hour for thirty days.

**Results-** There was significant reduction of anxiety status inventory count. No significant difference was found out between Pranayama and aerobic exercise.

**Conclusion-** Pranayama and Aerobic Exercise have remarkable effect to relax mind and body, so this should be included in the curriculum in order to keep the medical students mentally and physically fit to face the challenge of profession.

## Evaluation of drug preparations and their indications in drug promotional literature

Usha Rani D.<sup>1</sup>, Sangita G. Kamath<sup>1</sup>, Varun H. V.<sup>1</sup>, Harsha K. P.<sup>2</sup>, Umakant N. Patil<sup>3</sup>

P344

<sup>1</sup> Post graduate students, Department of Pharmacology, SSIMS & RC, Davangere; <sup>2</sup> Former Assistant Professor, Department of Pharmacology, SSIMS & RC, Davangere; <sup>3</sup> Professor and Head, Department of Pharmacology, SSIMS & RC, Davangere.

**Aims and Objectives:** To assess the approval status of drugs and their promoted indications in drug promotional literatures (hand-outs).

**Methods:** 500 drug hand-outs from clinical departments of SSIMS & RC, Davangere were collected between January 2012 to April 2012, of which 200 meeting the inclusion and exclusion criteria were selected. The approval status of drugs and the promoted indications were cross-verified with Drug Controller General of India (DCGI) and United States Food and Drug Administration (USFDA) websites.

**Results:** Of 200 drug hand-outs, 167(83.5%) drug preparations were approved; 67(33.5%) by DCGI, 28(14%) by FDA & 72(36%) by both. 33(16.5%) of drugs were not approved at all. Out of total 450 indications mentioned in 183(91.5%) advertisements, only 261(58%) were approved; 168(37.3%) by DCGI, 170(37.8%) by FDA and 78(17.3%) by both. Among 189(42%) unapproved indications, 102(22.7%) were promoted by approved drug preparations and 87(19.3%) by unapproved drug preparations.

**Conclusion:** Around half of indications promoted by drug companies were unapproved by regulatory authorities. Quality of prescriptions can be improved if regulatory authorities become more stringent in approving drugs and their promoted indications.

**Keywords:** Drug advertisements; DCGI; FDA; indications.

**Corresponding address:** Dr. Usha Rani D. Postgraduate student, Department of Pharmacology, SSIMS & RC, Davangere - 577005. **E-mail id:** drusha83\_pd@yahoo.in



## Effect of exercise on cardio respiratory changes in school children

P345

Usha Shenoy, Karthiyaneekutty, Vinutha Shankar, Sumitra.

Department of Physiology, Sri Devaraj Urs Medical College, Tamaka, Kolar.

**Background:** Heart rate variability is a non-invasive method for assessing changes in autonomic functions. Exercises usually increase  $VO_2$  max and heart rate.

**Objective:** To investigate the effect of physical activity on HRV and Lung function test in school children.

**Materials and Methods:** 60 students of the age 12 – 15 years were recruited for the study from local schools. Subjects were divided into four groups based on intervention plan- aerobic exercise, calisthenics, yoga and control. The exercises were performed for 30 minutes for one month. HRV and lung function tests were assessed in the subjects, before and after intervention.

**Results:** Comparison of mean of variables of HRV and Physical activity among four groups at baseline and after exercise were by ANOVA. The HRV and PFT variables in every group before and after exercise were compared by paired t test. Post intervention HRV all the groups showed tendency towards increase in parasympathetic and decrease in sympathetic though it is not statistically significant. No difference in PFT with intervention among the 3 groups.

**Conclusions:** Any form of exercise influences HRV but not lung function tests.

## Cardiac autonomic function in type 2 diabetics using short term HRV test

P346

V. Pramodh\*, Prashanth Kumar M, B A Krishna Prasad and M V Nagendran

**Aim:** To assess cardiac autonomic function in type 2 diabetics using Heart Rate Variability test which is one of the simplest non-invasive tests.

**Methods:** This study was conducted in 35 diabetics and 35 healthy controls, to assess the autonomic control of the heart rate.

**Results:** The HRV values (SDNN, RMSSD; NN50; pNN50, LF, HF, LF/HF) were significantly reduced in diabetics compared to healthy controls. This study shows the presence of subclinical cardiac autonomic dysfunction in asymptomatic diabetics. However, this study does not correlate HRV changes with various degrees of glycemic control and different durations of diabetes. More prospective studies in large diabetic populations are required to validate this inference.

**Key words:** HRV, Diabetics, cardiac autonomic dysfunction.

## Correlation of serum uric acid with heart rate variability in hypertension

P347

Vaishnavi Prakash, Navya Purushottam, Sushma Mohan, Ramya Chinnaswamy, Kirthana Kunikullaya U.

Department of Physiology, M S Ramaiah Medical College, MSRIT Post, MSR Nagar, Bangalore -560054, Fax: +91-080-23606213

**Aim:** Autonomic dysfunction, not routinely investigated unless indicated, is common among hypertensives. Biomarkers of hypertension have a disadvantage of higher price. Uric acid is easily assayed and available at a reasonable cost. We aimed at studying correlation between uric acid and heart rate variability (HRV) as very few studies have indicated correlation between uric acid and autonomic function. Existence of such correlation would provide insight into the autonomic function of the hypertensives just by testing uric acid.

**Objective:** To evaluate the correlation of serum uric acid with Heart Rate Variability (HRV).

**Methods:** Normotensives, pre-hypertensives and hypertensives, 35 subjects in each group were recruited. Serum uric acid and HRV was analyzed. ANOVA and Pearson's correlation was computed by SPSS version 18.0 software. P value of <0.05 was considered statistically significant.

**Results:** Negatively, Correlation of uric acid was observed with all the time domain parameters and HF power in the whole sample and among pre-hypertensives. Positive correlation was seen with LF power in the overall sample and among pre-hypertensives and with LF/HF among normotensives and hypertensives.

**Conclusion:** This study shows that a simple test such as uric acid may provide insight into the autonomic function of the individual, especially if they are in the pre-hypertension stage.

**Corresponding address:** Dr.Kirthana Kunikullaya U, Assistant Professor, Department of Physiology, M S Ramaiah Medical College, MSRIT Post, MSR Nagar, Bangalore -560054, Fax:+91-080-23606213; Email: kirthanaku@gmail.com

## Hypoglycemic, Hypolipidemic and hypoinsulinemic effect of flaxseed and wheat bran in obese subjects

P348

Vani Gupta,<sup>1</sup> Jagdish Narayan,<sup>1</sup> Nar Singh Verma,<sup>1</sup> Abbas Ali Mahdi,<sup>2</sup> Sunita Tiwari<sup>1</sup>

<sup>1</sup>Department of Physiology, King George's Medical University, Lucknow UP, India; <sup>2</sup>Department of Biochemistry, King George's Medical University, Lucknow UP, India.

**Background:** Obese individuals have high glucose level and high lipid level. This study determined lipid lowering effect of flaxseed in comparison to wheat bran and its role in decreasing obesity and in improving insulin sensitivity in obese individuals.

**Objective:** To investigate the beneficial role of consumption of flaxseed powder and wheat bran for 45 days on obesity, glucose level and lipid profile in individuals.

**Methods:** In this cross over, case control study 120 obese subjects having BMI>30 kg/m<sup>2</sup>, WHR (in male >0.9 and in female >0.85) were divided into two groups; group A (flaxseed powder for 0-45 days and wheat bran for 46- 90 days); n=60 and group B (wheat bran for 0-45 days and flaxseed powder for 46-90 days); n=60. Total time duration for flaxseed powder and wheat bran consumption for each group was 90 days. Main outcome measures were mean changes in blood glucose, lipid profile, insulin resistance and WHR as compared with baseline.

**Results:** After consumption of 30g flaxseed powder and 30g wheat bran for 45 days (30g in two divided doses per day), significant low level were observed as compared to baseline for WHR (0.90±0.05 to 0.88±0.005, p=0.030), total cholesterol (210±22 to 198±19 mg/dl, p=0.001), LDL (143±9.6 to 126.2±7.7 mg/dl, p=<0.001), glucose (115±20 to 103±19mg/dl, p=<0.001), insulin resistance (3.45±0.35 to 2.89±0.32,p=<0.001), and significant increase was found in level of HDL (35±7.0 to 41±5.7 mg/dl, p=<0.001) in Group A. Similarly, significant low level were observed on 90<sup>th</sup> as compared to 45<sup>th</sup> day for WHR (0.91±0.005 to 0.89±0.05, p=0.030), glucose (101±19 to 91±20, p=0.005), total cholesterol (208±21 to 195±22 mg/dl, p=<0.001), LDL (138.6±9.1 to 122.6±9.9mg/dl, p<0.001) and significant increase in HDL (38.0±7.2 to 41.4±6.9 mg/dl, p=0.009) in Group B. However, there are no significant changes for BMI, triglyceride, VLDL and insulin concentration were observed in both the groups while wheat bran was given for 45 days.

**Conclusion:** Flaxseed powder is much more effective in lowering glucose levels, lipid profile and insulin resistance and have sliming effect than wheat bran in obese subjects.

**Keywords:** Flaxseed, Wheat bran, Glucose, LDL, HDL, Insulin, Insulin resistance, Waist hip ratio

## **Diagnostic peripheral nerve ultrasonography (USG) in diabetic peripheral neuropathy (DPN) patients.**

P349

<sup>1</sup>B.Varadharaju,<sup>2</sup>K.M. Sivasubramanian,<sup>3</sup>G.Balachandran,

**Aims** - To document the ultrasound findings in DPN patients and to correlate them with nerve conduction studies (NCS).

**Objectives** - To evaluate the relationship between NCS results and USG findings in diabetic patients and to establish a non-invasive, cost-effective method for early diagnosis of diabetic peripheral neuropathy.

**Methods**- Two groups (56 chronic diabetic patients, 49 normal controls) were studied. All of them had ultrasonography of peripheral nerves in upper limb (median, ulnar) and in lower limb (tibial and common peroneal). All the diabetic patients later underwent nerve conduction studies.

**Results**- The ultrasound parameters assessed were cross sectional area and echogenicity of peripheral nerves. There was a statistically significant increase in the nerve cross-sectional area of all diabetic patients. The peripheral nerve motor distal latency showed a positive correlation and motor nerve conduction velocity showed a negative correlation with nerve cross sectional area.

**Conclusions**- Imaging the peripheral nerves by ultrasonography is highly useful in assessing diabetic neuropathy. Compared to the nerve conduction studies; the USG results are very promising and encouraging. Thus the USG - can complement and supplement NCS in future, for diagnosis and follow up of diabetic neuropathy patients.

**Corresponding address:** Dr.B.Varadharaju, MBBS, MD(physiology), 258,H.I.G.,Ashok nagar, Lawspet, Pondicherry-605008. Mobile no.8220540737 E-mail-id: Dr.varadhu@gmail.com

## **Analysis of claims in drug promotional literature**

P350

Varun H.V, Sangita G. Kamath., Usha Rani D., Harsha K.P., Umakant N. Patil

Department of Pharmacology, SSIMS & RC, Davangere.

**Aims and Objectives:** To evaluate the claims presented in the drug promotional literatures for their scientific authenticity and validity.

**Methods:** 217 drug promotional literatures containing at least basic scientific information were collected from outpatient departments of SSIMSRC, Davanagere and were analysed for the claims and the references quoted in support of the claims. The level of evidence of the references was categorized according to (United Kingdom National Health Services) UK NHS classification.

**Results:** Of the 217 drug promotional literatures assessed, only 204(94.01%) had claims with an average of  $4.2 \pm 2.9$  claims per literature. 919 claims in total were present in the 204 literatures of which 332(36.13%), 122(13.28%), 86(9.36%), 27(3%) and 352(38.3%) were related to efficacy, safety, dosage/convenience, cost and other claims respectively. Only 386(42%) claims were supported with a total of 287 references. 170(18.5%) claims were substantive with the reference quoted. 31(3.37%) claims were false. References with level I evidence were only 110(38.3%). Brief prescribing information was provided in only 49 (22.6%) promotional literatures.

**Conclusion:** Claims quoted in the drug promotional literatures by pharmaceutical companies may not be valid always. The doctors have to verify the claims quoted in these literatures before taking any decisions while prescribing.

**Keywords:** Claims; Drug promotional literature; UK NHS, level of evidence

**Corresponding address:**Dr. Varun H.V. Department of Pharmacology, SSIMS & RC, Davangere-5 Mobile no. 9611599926; Email id: varunhvdoc@gmail.com

### **Protective role of Black Tea Extract on Cadmium Chloride (CdCl<sub>2</sub>) induced alteration of serum and liver nitric oxide and antioxidant vitamins(C & E) levels in male albino rats.**

**Venkappa S. Mantur\*<sup>1</sup>, Shivaprasad S.Goudar<sup>1</sup>, Manjunath S. Somannavar<sup>2</sup> and Kusal. K.Das<sup>3</sup>**

P351

Department of Physiology<sup>1</sup>, Biochemistry<sup>2</sup>, Jawaharlal Nehru Medical College, JNMC campus, KLE University, Belgaum, Karnataka and Department of Physiology, Shri B.M.Patil Medical College, BLDE University, Bijapur, Karnataka, India<sup>3</sup>.

**Objective:** To study the possible ameliorative effect of black tea extract (BTE) on cadmium chloride induced alteration of hepatic nitrosative stress in male albino rats.

**Method:** Adult rats were divided into four groups (n=6/group); group I (normal saline), group II (CdCl<sub>2</sub>, 1.0mg/kg, b.wt.; i.p.), group III (black tea extract, 2.5 gm tea leaf/dl of water that is 2.5% of aqueous BTE) and group IV (cadmium chloride + BTE). The CdCl<sub>2</sub> treatment and BTE supplementation were continued for 21 days before sacrificing the animals. Blood samples were collected to estimate the serum nitric oxide, vitamins C & E. Liver tissues were dissected out and processed for estimation of liver nitric oxide and vitamin C.

**Results:** The results clearly indicate an increase level of serum and liver nitric oxide concentration with concomitant decrease of serum vitamin C and E level in the rats treated with cadmium chloride. Result also showed a decrease of hepatic vitamin C concentration in cadmium chloride treated rats as compared to their control. Interestingly a remarkable improvement of serum nitric oxide and antioxidant vitamins (C & E) levels were noticed in cadmium treated rats which were supplemented with BTE.

**Conclusion:** It may be postulated that cadmium chloride is a hepato toxic substance which induces nitrosative stress in liver tissues possibly by influencing nitric oxide synthase pathways which is reflected by increase level of serum and liver nitric oxide concentrations along with decrease levels of antioxidant vitamins (C&E). Supplementation of BTE is found to be beneficial to regulate the nitric oxide synthase pathways in hepatic tissues treated with cadmium chloride. Possibly antioxidant properties of BTE play a pivotal role to counteract the nitrosative stress in hepatic tissues which is further supported by the elevation of serum antioxidant (Vitamin C & E) levels in cadmium treated rats in our study.

### **Reflective ability for professional and personal development- a perception survey**

**Venkatesh D, Dr Ashwini C Appaji\*, Dr Arun Kumar**

P352

Department of Physiology, \*Department of Anatomy, M S Ramaiah Medical College, Bangalore

**Aims:** To assess the reflective ability of fresh Postgraduate students

**Objectives:** Reflection is a purposeful activity to revisit our experiences and learn from them in practice based professional learning. Reflection facilitates personal and professional development by promoting self directed and lifelong learning. Reflective practices are not regularly followed and assessed in our country. In view of

importance of reflective learning, a survey was conducted to measure the reflective ability of postgraduate students.

**Material and Methods:** Ninety eight first year postgraduate students participated in the survey. The Groningen Reflective Ability Scale (GRAS), a standardized and validated questionnaire was used for the survey. This questionnaire has 23 items which is scored on a five point Likert scale. This questionnaire measures the ability of personal, empathetic reflection and receptivity for reflective communication.

**Results:** The analysis of responses to GRAS questionnaire revealed that the students had a fair ability for personal reflection (3.68/5); the ability for empathetic reflection was good (3.88/5). However, the ability for reflective communication was poor (2.85/5).

**Conclusions:** There is a need for formal training and assessment to reflect personally, empathetically and be receptive to reflective communication to promote lifelong self directed learning at all levels in medical professional course.

### Study of serum Selenium level and its effect on male infertility

P353

Verma A.R., Khodiar P.K.

Dept. of Physiology, Pt. JNM Medical College, Raipur, (CG) India

**Introduction:** Some of the biomedical research has shown interest in the anti-oxidant activity of selenium which could be due to evidences reported that oxidative damage to cells and cell membranes is one of the causative agents in the pathogenesis of many disease states including male infertility.

**Objectives:** To measure role of Selenium levels in male infertility and assess the effect on different parameters like sperm count, sperm morphology & sperm motility.

**Methods:** Our study included 58 infertile and 52 normal fertile males in age group of 22 – 50 years.

**Results and Conclusions:** The apparent difference in serum Selenium between the normal fertile controls and infertile cases turned out to be statistically significant ( $p < 0.01$ ) and there seems to be a positive correlation between low serum Selenium levels and semen quality parameters like count, motility and morphology. It is proposed that Selenium acts as free radical scavenger and improves semen quality by virtue of antioxidant component of selenoprotein and classical glutathione peroxidase (GPx)

**Key words:** Infertility Selenium Glutathione peroxidase

**Corresponding address:** Dr A. R. Verma, Assistant Professor , Dept. of Physiology, Pt. JNM Medical College , Raipur,(CG) India.-492001 E-mail: dr\_arv2009@rediffmail.com Mob: 09926177893

### Influence of Atorvastatin on Neurobehavioural Responses in Estradiol Treated Hypoglycemic Rats

P354

Verma S, Srivastava RK, Singal R, Sood S\*

Department of Pharmacology and \*Physiology, Pt. B.D. Sharma PGIMS, UHS, Rohtak.

**Objectives:** Long term administration of statins is desired for the management of dyslipidaemia in chronic diabetic patients. Incidence of hypoglycaemia is high in stringently controlled diabetes which can have detrimental effects

on neurological functions. The present study was planned to see the effect of atorvastatin on neurobehavioural responses in insulin hypoglycaemia with and without estrogen in female rats.

**Methods:** Female rats divided into six groups (n=8) received atorvastatin (20mg/kg, orally), vehicle of atorvastatin, estradiol benzoate (100µg/kg,ip), vehicle of estradiol benzoate, estradiol benzoate + atorvastatin, vehicle of atorvastatin + estradiol benzoate daily for 15 days. Rats of all the groups were exposed to insulin hypoglycaemia and neurological outcome scores were recorded using 18-point scale and EEG recording was done on a polygraph machine before and after 15 days of initiation of treatment.

**Results:** Insulin hypoglycaemia caused significant (p<0.001) impairment of neurological functions by way of increasing the neurological outcome scores. Atorvastatin and estradiol benzoate deteriorated the neurological functions which were further aggravated when they were given in combination in hypoglycaemia. Insulin hypoglycaemia showed rhythmic slowing of waves and decrease in frequency and amplitude of waves in EEG in all the groups.

**Conclusion:** Atorvastatin aggravated the deterioration of neurological functions in presence of estradiol benzoate during insulin hypoglycaemia.

## **SIRT1 protein - maintains youthful physiology and extend life span without calorie restriction**

**Vibha Khajone, S Chandra MD,**

P355

Department of Physiology, Sri Manakula Vinayagar Medical College and Hospital Madagadipet, Kalitheerthalkuppam, Pondicherry - 605 107. Email - vibhakhajone@gmail.com

In humans, specific sirtuin protein called Sirt1 operates in the brain to bring about a significant delay in aging and an increase in longevity. Both have been associated with a low-calorie diet and its function was unknown. SIRT 1 has NAD<sup>+</sup> - dependent class III histone deacetylase activity, **encoded by the Sirt1 gene**. SIRT1 has broad biological functions in growth regulation, stress response, tumorigenesis, endocrine signaling, and extended lifespan.

Significant life-span extension without undergoing dietary restriction was seen in the BRASTO mice. The mice that over expressed Sirt1 in the brain (called BRASTO) had significant life-span extension and delay in aging even without dietary restriction, just like normal mice with dietary restriction regimens.

The longevity and health profile associated with the BRASTO mice resulting in shift in the onset of aging rather than the pace of aging. When age-related decline begins, in BRASTO mice, delay in the aging time occurs. So the rate of aging does not change resulting in postponement of aging and cancer.

In the brain, the control center of aging is in hypothalamus (dorsomedial and lateral hypothalamic nuclei). Over expression of Sirt1 in the brain leads to an increase in the cellular response of a receptor called orexin type 2 receptor in the two areas of the hypothalamus. There is an association between Sirt1-prompted brain activation and the regulation of aging and longevity which raises the possibility of a "control center of aging and longevity" in the brain. This maintains youthful physiology and extend life span in other mammals as well even without calorie restriction.

## Correlation between Affect and Internet Addiction in Undergraduate Medical Students in Mangalore

P356

Vidya Chathoth, Bhagyalakshmi Kodavanji, Nayanatara Arun Kumar, Sheila Ramesh Pai

Department of Physiology, Kasturba Medical College, Mangalore, Unit of Manipal University, Karnataka, India;

**Background:** In the case of addictive behaviour pertaining to substance use, affective disturbances are known to increase the risk of addiction. It is not known if this is also applicable to behavioural addictions. We therefore conducted this study to assess the correlation between affect and internet addiction in a sample population of undergraduate medical students.

**Objective:** To assess the correlation between internet addiction test scores, using the Young's Internet Addiction Test and affect scores, using the PANAS scale.

**Materials and Methods:** This cross-sectional study involved 90 first year undergraduate medical students from KMC Mangalore (18-20 years of age). Young's Internet addiction test and the PANAS questionnaire were administered. Test scores were calculated for each. Correlation between the internet addiction test scores and the positive/negative affect scores was then calculated using the Pearson's correlation coefficient.

**Results:** A positive correlation was found between the internet addiction test scores and the negative affect scores. A positive correlation was also found between the daily duration of internet use and negative affect scores.

**Conclusion:** Our study demonstrated a strong correlation between negative affect and internet addiction, highlighting the role of affect in behavioural addictions. This correlation can be made use of in screening adolescents for internet addiction.

**Keywords:** Internet addiction, negative affect

**Corresponding Address:** Dr. Vidya Chathoth, Postgraduate student (MD), Department of Physiology, Center for Basic sciences, KMC Mangalore (Unit of Manipal university), Bejai, Mangalore, Karnataka, India -575004 E-mail: vidyanov@yahoo.com

## Oxidative stress in pregnant women at risk for preeclampsia: correlation with sympathovagal imbalance

P357

Vidya K<sup>1</sup>, Pal GK<sup>1</sup>, Habeebullah S<sup>2</sup>, Soundaravally R<sup>3</sup>, Velkumary S<sup>1</sup>, Pal P<sup>1</sup>

Department of Physiology<sup>1</sup>, Department of Obstetrics & Gynaecology<sup>2</sup>, Department of Biochemistry<sup>3</sup>, Jawaharlal Institute of Post Graduate Medical Education and Research, Puducherry - 6.

**Objectives:** To assess the contribution of oxidative stress to the genesis of sympathovagal imbalance in pregnant women with known risk factors for preeclampsia (PE).

**Methods:** We performed a case-control study comparing the basal heart rate (BHR), blood pressure (BP), heart rate variability (HRV) indices, oxidative stress in early mid-trimester of pregnancy among 40 pregnant women at risk of PE (cases) with 40 normal pregnant women (controls) and sympathovagal balance (SVB) (LF-HF ratio) was correlated with oxidative stress markers.

**Results:** The baseline supine cardiovascular parameters (resting HR, SBP, DBP, MAP, and RPP) were significantly higher in the cases compared to the controls. Significant reduction in HRV with increased sympathetic activity in the form of elevated LFnu, (P=0.0306) and subdued parasympathetic modulation in the form of decreased HFnu, (P=0.0308) and increased LF-HF ratio (P=0.0229) were observed among cases. The level of MDA, marker

of lipid peroxidation was significantly higher and the total antioxidant status was significantly reduced in cases ( $P < 0.0001$ ). Increased oxidative stress correlated significantly with LF-HF ratio revealing the contribution of oxidative stress to the sympathovagal imbalance (SVI).

**Conclusions:** Increased oxidative stress resulting from complex interactions of various co-morbid factors contributes to the derangement in autonomic function in pregnant women at risk for PE from their early part of pregnancy. Therefore, an early detection of SVI and intervention may be needed in preventing the development of PE and future cardiovascular morbidities in these pregnant women.

**Corresponding address:** Dr. Vidya karpagam K, Junior resident, Department of Physiology, JIPMER, Puducherry-605006; Phone: 09840353053; E-mail: drvidyajipmer86@gmail.com

## Mobile Use on Reaction Time – A Cross Sectional Study

P358

Vidya M Nadiger, Vikas V

**Aims:** To compare auditory and visual reaction time in mobile users and not users.

**Methods and Material:** Thirty subjects using mobile and 30 subjects who were not using mobile were recruited for the study. The reaction time was recorded for auditory (4 different frequency) stimuli and visual (blue, red, green and yellow) stimuli. As soon as the stimuli was perceived by the subject, he responded by pressing the response switch by the index finger of the dominant hand. The display indicated the response time.

**Results:** In the present study all visual and most of the auditory stimulus had evoked significantly prolonged reaction time in chronic mobile users when compared to the control group. The reaction time with respect to visual stimulus of red, blue, green and yellow was found to be prolonged in chronic mobile users. The reaction time to auditory stimulus of 3 different types of sounds was found to be significantly increased.

**Conclusions:** The reaction time with respect to the red, blue, green and yellow visual stimulus is found to be prolonged in chronic mobile users. This points out to the fact that such subjects could more vulnerable for accidents as traffic signals also have the same colour lights. Also the reaction time to the auditory stimulus of different horn sounds were shown to be prolonged in chronic mobile users. This points out to the fact that chronic mobile users are more prone to traffic accidents.

## Effect of *Pluchea Indica* Less on chronic unpredictable stress (CUS) Induced memory impairment in male Wistar Albino rats

P359

Vidyashree H M, Dr.R Ravindran

Dept of Physiology, Dr.ALM PG IBMS, MadrasUniversity

**Aims & Objectives:** To evaluate the effect of CUS on memory and to evaluate the effect of hexane extract of *P.indica* Less. on CUS induced memory impairment.

**Methodology:** Wistar male albino rats (n=24) were randomly divided in to four groups namely control, control treated with hexane extract of *P.indica* L, CUS group and CUS group treated with herb *P.indica* L. for 30 days, 300mg/kg/ BW orally. Plant *P.indica* Less. is collected from IMCOPS, Chennai. Authentication was done by HOD, Center for Advanced Studies in Botany, MadrasUniversity. Hexane solvent extraction of leaves and stems of *P.indica* was prepared.



CUS protocol is as follows , immobilization stressor for 15 minutes followed by overnight sleep deprivation and rotation of the cage at a predetermined speed (horizontal shakes at high speed) for 50 minutes followed by swim stress in water (20°C) of 4 minutes. Wetting the saw dust bedding of the animal all day to restrict movement followed by electric foot shock (ten shocks of one second duration each, in an unpredictable manner, at the intensity level of 0.4-1.8 mA) for the duration of 30 days. Effect of *Pindica* L will be demonstrated by the changes in following parameters like oxidative markers, enzymatic and non enzymatic antioxidants, neurotransmitter estimation in discrete brain regions, plasma corticosterone, BDNf estimation and by behavioural studies namely T Maze, Morris water maze, Skinner box.

**Results:** Study to be carried out

**Corresponding author** – Dr. R Ravindran, Assistant Professor, Department of Physiology, Dr ALM PG IBMS, Madras University, Taramani, Chennai-113; **Phone:** 044-24547163; **email address:** ravindran89@unom.ac.in

## Pulmonary function tests in overweight young adults

P360

**Vijaya Vageesh Y<sup>1</sup>, S.M.Nataraj<sup>2</sup>**

<sup>1</sup>Assistant Professor, <sup>2</sup> Professor & HOD, Department of physiology, JSS Medical College, constituent college of JSS University, Mysore-15

Obesity is increasing in prevalence in young adults because of the sedentary life style and indoor games. Overweight is associated with number of comorbidities in young adults. Although amount of information available about youth is less than that of adults, it is clear they experience many detrimental effects. Present study was taken to know the pulmonary function tests in overweight young adults as data is more available on obesity. Study was done on first year medical students of JSS Medical college, Mysore. Study and control group had 30 students (15 boys and 15 girls) who were overweight and normal weight, were categorized by BMI and WHR. PFT was done using powerlab computerized spirometer.

Pearson's correlation was done. TV, FVC, FEV<sub>1</sub>, FEV<sub>1</sub>/FVC, PEFR were all reduced in overweight young adults compared to normal weight. When correlation was done between TV, FVC, FEV<sub>1</sub>, FEV<sub>1</sub>/FVC, PEFR individually with BMI, there was no significance, ie P>0.05.

Study showed that though there was a reduction in PFT parameters, but when correlated with BMI was insignificant indicating that PFT can be improved back to normal with modification in lifestyle and physical activity.

**Corresponding author:** Dr. Vijaya Vageesh Y, Asst. Professor, Department of Physiology, JSS Medical College, Mysore-15; E-mail: vijayavageesh@yahoo.co.in

## Effect of pranayama on visual reaction time (VRT) in tobacco chewers.

P361

**Vikas Shelke, R.G.Latti, A.N.Badwe, Kiran Thorat**

**Introduction :** Tobacco is consumed in various forms all over the world, such as smoke, snuff, smokeless tobacco. It is reported that smokeless tobacco reduces motor skills and learning ability which indicate the effect of tobacco on nervous system. The pranayama also affects CNS in the regular practitioners of pranayama. Hence in present study, it is planned to study the effect of pranayama on Visual Reaction Time (VRT) .

**Aims And Objectives:** In present study it is decided to study the effect of tobacco chewing and effect of Pranayama on VRT in tobacco chewers and non tobacco chewers accordingly.

**Materials And Method:** Sixty participants were selected & divided in two groups as (1) Tobacco chewers; (2) Non – tobacco chewers. The subjects were trained to perform pranayam (anulom – vilom and kapalbhati) daily for 15 minutes in the morning for next three months. VRT of both hands was determined by using method described by Madan Mohan and A. K. Jain before and after pranayam training.

**Result:** There was a significant decrease ( $P < 0.05$ ) in VRT recorded in both the groups.

**Key words:** Pranayam, VRT, Tobacco Chewers.

**Corresponding address:** Mr. Vikas Shivajirao Shelke, Asst.Lecturer, Dept. of Physiology, MVP's Dr.Vasantrao Pawar Medical College, Nashik – 03(Maharashtra State)Email ID: vickyshelke2007@rediffmail.com

## A Comparative Study of Serum Cholesterol in Vegetarian and Non-Vegetarian Postmenopausal Women

P362

\* Vikash Sharma, Jyotsna Das, Munmi Gogoi

Department of Physiology, Assam Medical College, Dibrugarh, Assam e-mail: Sharma.vikash425@gmail.com

**Aims And Objectives:** 1) To determine the value of serum cholesterol in postmenopausal vegetarian and non-vegetarian women; 2) To compare serum cholesterol in postmenopausal vegetarian and non-vegetarian women

**Materials And Methods** In a cross-sectional study, 150 subjects were selected from different localities of Guwahati city and were divided into vegetarian and non-vegetarian post-menopausal group and to ensure similarity between two groups Inclusion Criteria of Age group 45-65 yrs, Weight in between 50-70 kgs, Non-smokers, Non-alcoholics and Exclusion Criteria of those on Hormone replacement therapy or on drugs that alter lipid profile are considered. Serum cholesterol was estimated by Cholesterol oxidase peroxidase (CHOD-POD) method using the commercially available enzymatic reagent kit with the help of a Digital Photo-colorimeter.

**Results** Mean cholesterol level was found to be much higher among non-vegetarian women than that of vegetarian women. Mean score of serum cholesterol among non-vegetarian group was 234.79 while those for vegetarian group was found to be 163.63 respectively. Student's t-test was adopted and a highly significant difference in serum cholesterol was found between non-vegetarian and vegetarian group at 0.01 level of significance ( $p < 0.01$ )

**Conclusion** Though menopause is associated with increased cholesterol level due to hormone changes but it is also influenced by the dietary habits where high intake of animal protein can lead or aggravate cardiovascular diseases so as a prophylactic measure we can advise post-menopausal women to reduce their animal protein intake to reduce the incidence of cardiovascular diseases among them.

## Impact of short term practice of yoga on pulmonary function in females

Vinay A V, Venkatesh D

P363

Department of Physiology, M.S.Ramaiah Medical College

**Aims:** To study the influence of short term practice of yoga on pulmonary functions in females.

**Objectives:** Yoga is reported to have health benefits. Recruit healthy female subjects, expose them to regular practice of yoga for duration of one month and evaluate changes in their pulmonary functions.

**Methods:** Twenty six healthy female volunteers in the age group of 30-60 years willing to practice yoga for a month participated in the study. Yoga practice included a set of physical postures, breathing techniques and

meditation under the guidance of certified yoga instructor. Pulmonary function test (PFT) was performed by computerized spirometry (Respmad Spirobank G, Italy) in all the subjects before the commencement of yoga practice. On completing one month of practice, second PFT was done. Parameters recorded were FVC, FEV<sub>1</sub>, FEV<sub>1</sub>/FVC and PEF, expressed as mean  $\pm$  standard deviation. Parameters were compared using paired t test and Wilcoxon sign ranked test for normative and skewed data respectively and  $p < 0.05$  was considered significant.

**Results:** There was a significant improvement in the percentage of FVC, FEV<sub>1</sub> and PEF from  $94.46 \pm 13.55$  to  $96.31 \pm 14.27$ ,  $93.46 \pm 15.32$  to  $95.73 \pm 16.48$  and  $79.96 \pm 15.5$  to  $85.38 \pm 18.45$ .

**Conclusions:** Regular practice of yoga for one month improves pulmonary functions.

## Comparative study of effect of stress on perception of experimental pain in adolescent girls & boys

Vineetha K. Ramdas Nayak and Shankarappa C

P364

Department of Physiology, VIMS & RC

**Introduction:** The perception of pain has two important components, the sensory discriminative aspects and affective-motivational aspects that are carried by two systems of nociceptive projections acting in a parallel and in a complementary manner. Stress analgesia is one of the most researched subjects amongst animals in the past 2 decades. Studies of pain in humans where natural stressors exist are few, due to difficulty of implementing such a study and multifold challenges to pain scoring in humans.

**Objective:** The objective of our study is to determine the effect of stress on pain. This study also compares difference of the effect of stress on perception of pain in adolescent girls & boys.

**Materials and methods:** It is a comparative and Cross Sectional Study. We included 30 adolescent girls & 30 adolescent boys who are 1<sup>st</sup> year medical students aged 18 years. They were assessed with General stress questionnaire before they were subjected to mental stressor (exam) and their pain thresholds & pain tolerance was measured using cold pressor task test. A locally designed water tub made up of glass was used. A thermometer was placed into the water tub to measure the temperature of crushed ice. This apparatus was used to immerse the non-dominant hand of subject (palm down, up to 5 cms above wrist level). Water was maintained at 0-2 degree c using crushed ice. Pain threshold & pain tolerance was measured in seconds using 2 separate stop watches.

**Result:** Stress scores were significantly higher in adolescent girls (Mean = 21.2) compared to Adolescent boys (Mean = 12.6). The pain tolerance was significantly increased in adolescent girls during presence of stressor not the pain thresholds when compared to adolescent boys.

**Conclusion:** This study focused on knowledge of effect of stress on pain as it is very important to uncover gender differences in pain perception as it contributes consistently to the professionals who deal with painful conditions can understand and deal more effectively with both sexes.

## Importance of body mass index in pregnancy induced hypertension

P365

Vinod P.T, R.G. Latti, R.B.Patil, and Sandeep Ghuge

M.R.Medical College, Gulbarga

**Aim:** The aim of this study was to determine the association between Body Mass Index (BMI) and Pregnancy Induced Hypertension (PIH)”

**Objectives:** (1) To observe the significance of BMI as a risk factor for PIH (2) To help decrease the incidence of complications of PIH.

**Materials and Methods:** A total of 180 pregnant women were enrolled in the study. The cases comprised of two groups of patients. Control group consisted of 90 cases of normal pregnant women of the second and third trimester. Study group consisted of 90 cases of varying degree of Pregnancy Induced Hypertension. The parameters included the Height and weight, both were recorded and the BMI was calculated (BMI; weight [kg] per height squared [m<sup>2</sup>]) The women were categorised into five groups according to their BMI as follows: underweight (BMI < 20 Kg/m<sup>2</sup>), normal (BMI 20 – 24.9 Kg/m<sup>2</sup>) overweight (BMI 25 – 29.9 Kg/m<sup>2</sup>), obese (BMI 30 – 34.9 Kg/m<sup>2</sup>) and morbidly obese (BMI > 35 Kg/m<sup>2</sup>).

**Results:** In comparison with women of normal BMI, morbidly obese women faced the highest risk of PIH with P-value of less than 0.01 which was regarded as statistically significant.

**Conclusion:** PIH appears to be more common in morbidly obese women. Hence care should be taken to prevent complications.

## Electrophysiological evaluation of median nerve entrapment at wrist in Uremia

P366

Vinod Shende, Rajat Sharma, A R Chaudhari

Department of Physiology, MGIMS Sevagram

**Objective:** Uremia is associated with polyneuropathy as well as focal neuropathies, such as median nerve entrapment neuropathy at wrist (carpal tunnel syndrome; CTS). CTS can be diagnosed by clinical examination and electrophysiological evaluation. Although literature is available regarding the prevalence of clinical and electrophysiological CTS in uremic population worldwide, it is insufficient in Indian context. Therefore, the present study is designed to find out the diagnostic utility of electrophysiological tests in CTS among uremic patients attending a rural hospital in Central India.

**Aim:** To find out frequency of CTS by electrophysiological examination in uremia

**Methods:** Cross-sectional study was carried out on 40 subjects of 30 years and above in Neurophysiology lab. Clinically diagnosed cases of CTS were referred to us from medicine dept. The nerve conduction studies were performed on RMS EMG EP Mark-II machine.

**Results:** Frequency of CTS by electrophysiological examination was 15.09% with routine test and 24.53% with comparison test and among comparison tests lumbrical interossei study was found to be most sensitive(92.31%) and digit 4 comparison study most specific(90 %).

**Conclusion:** Findings of the study suggest that electrodiagnostic tests are supportive diagnostic tool for suspected median nerve entrapment syndrome at wrist in uremia.

**Corresponding Address:** Dr Vinod Shende, Asst Professor, Dept. of Physiology, MGIMS Sevagram  
Email: drvinodshende@gmail.com

### **Readiness Assessment tests as motivators for preparedness during tutorials**

**Vinutha Shankar MS, KarthiyaneeKutty, UshaShenoy, Jagadamba A**

P367

Dept of Physiology, Sri DevarajUrs Medical College, Tamaka, Kolar,

**Introduction:** Readiness Assessment tests (RATs) require students to respond to questions about the assigned readings prior to class discussion. The RATs can be done at the beginning of class. Theoretically, any question type could be used to assess students' readiness to engage in discussion, but we have used multiple choice questions.

**Objectives:** The major objectives of RATs are to encourage students to come prepared for tutorial discussion and to keep up with the material to prevent cramming for an examination.

**Methodology:** During tutorial sessions, MCQs based on the topic that has been allotted for the tutorials will be first administered individually to assess Individual Readiness Assessment Tests (IRAT). Later for the Group Readiness Assessment Tests (GRAT), the students are divided into groups and the same MCQ test administered for Group response. Later the facilitator elicits group responses and asks the group to justify the right answer and give reasons as to why the distractors are not the right answer. Groups are awarded marks based on the number of correct responses they get.

**Results:** Readiness assessment tests improve student performance by encouraging active involvement and immediate feedback. Students perceive this as an enjoyable learning experience.

**Conclusion:** Faculty should be encouraged to construct MCQs of higher cognitive domain with effective distractors to enhance the utility of Readiness Assessment Tests.

**Corresponding address:** Vinutha Shankar MS, Dept of Physiology, Sri Devaraj Urs Medical College, Tamaka, Kolar, Karnataka E mail id: vinutha.shankar@gmail.com

### **Study of Baroreflex Function in Battery Workers Having High Blood Lead (Pb) Level with Risk of Cardiac and Autonomic Neuropathy in Lucknow City**

P368

**Virendra Atam<sup>1</sup>, Shyam Vinay Sharma<sup>2\*</sup>, Pradeep Kumar<sup>3</sup>, Anoop Verma<sup>4</sup> and R C Murthy<sup>5</sup>**

1 Professor, Department of Medicine, KG's Medical University, Lucknow, India; 2 Research Scholar, Department of Medicine, KG's Medical University, Lucknow, India; 3 Professor, Department of Physiology, K G's Medical University, Lucknow, India; 4 Professor & Head Department of Forensic Medicine & Toxicology, K G's Medical University Lucknow, India; 5 Chief Scientist & Head, Analytical chemistry section, IITR, Lucknow, U.P., India.

**Aims & objectives :** To evaluate the baroreflex function in battery workers having high blood lead (Pb) level.

**Introduction:** The arterial baroreflex regulate the blood pressure and maintain circulation to other brain and other organs. Baroreceptors sense systemic blood pressure indirectly, by the extent of stretch of receptors in the walls of the carotid arteries and of the aorta. Lead (Pb) exposure continues to be a major public health problem; particularly in urban area of the USA and India Lead enters astroglia and neurons via voltage-sensitive calcium channels. Lead disrupts calcium homeostasis, causing a marked accumulation of calcium in lead-exposed cells.

**Method:** Thus lead(Pb) can modulate various reflexes of the body including baroreflex. In present study we indirectly assess the baroreflex sensitivity(BRS) by quantifying sinus arrhythmia and change in blood pressure induced by volunteer apnea and change in posture.

**Result:** There was a significant increase in the HR when the posture changed from supine to standing, being highest in standing this increase was more in control ( $79.43 \pm 8.78$ ) than cases. Our data showed that increase in heart rate in lead exposed persons was significantly lower than controls.

**Conclusions:** Our study data suggests that Lead(Pb) exposure causes decrease in baroreflex sensitivity in battery workers which may lead to orthostatic hypotension and deregulation of cardiovascular hemodynamic.

**Keywords:** Lead, Baroreflex, Battery Workers, Sinus, arrhythmia

**Corresponding Author:** Shyam Vinay Sharma<sup>2\*</sup> Research Scholar, Department of Medicine, KG's Medical University, Lucknow, India; Email: sv\_sharmakgmu@rediffmail.com. Mobile No. 09415832965

### Emotional drama causes somatic trauma and vice versa

P369

Visalam.RM\*, Semmal\*\*

Department of Physiology, Sri Ramachandra Medical college and Research institute Porur, Chennai

There exists a relationship between mental health and physical health is an idea that has been passed on for generations. In the science era that we live in we need to support and prove the above statement beyond doubt. The cardiac pain caused in ischemic heart disease crafted a deeper crater in our thinking graph. Cardiac pain could be the result of an abnormal stimulation of afferents leading to complexities of higher centres as per experiments.

Metabolites like bradykinin and histamine produced during ischemia causes autonomic disturbances. With a help of physiological tools such as beat to beat cardio vascular variability compared with behavioural changes of telemetered and coronary artery ligated rodents, the connection between ANS and the ischemic heart of rodents were enlightened. The obtained result substantiates the hypotheses that major abnormality of the ANS state could be the peripheral trigger for abnormal anxiety behaviour. "The relationship between the incidence of panic disorder and the cardiac system with its vascular components is the result of, rather than the cause of, ventricular dysfunction".

This in turn comes to say the knowledge of being affected by heart disease invites more anxiety attacks and disease status regresses. In patients with congestive heart failure cardiac transplants and cardiac rehabilitations has reversed the hemodynamics and also the sympathetic oscillatory profile.

### Effect of deep breathing on electrical axis of heart in young healthy volunteers as determined by formula and Einthoven triangle.

P370

Vishnu Priya H, Madanmohan T

No: 2, II floor, I main road, Bharathidasan Nagar, Mudaliarpet, Pondicherry

**Aims:** To study the effect of deep breathing on electrical axis of heart. To compare the electrical axis of heart obtained by formula and Einthoven triangle.

**Objectives:** To test the accuracy of formula in calculating electrical axis of heart.

**Methods:** 45 healthy subjects (20-30 y) were recruited based on inclusion and exclusion criteria. After 10 min of

supine rest, leads I & aVF were recorded during eupnea, after full inspiration & full expiration. The electrical axis of heart was calculated by dropping perpendiculars on the Einthoven triangle and also by using formula:  $EA = \pm 90 - \theta$  where  $\theta = \tan^{-1} (I / aVF)$

where I and aVF denote mean QRS amplitude in leads I and aVF respectively. If aVF is positive, then  $EA = 90 - \theta$ , if aVF is negative, then  $EA = -90 - \theta$

**Results:** Full inspiration produced a significant ( $p < 0.001$ ) increase while full expiration produced an insignificant ( $p = 0.06$ ) decrease in electrical axis of the heart as compared to eupnea.

**Conclusions:** In conclusion, full inspiration results in a significant increase in electrical axis of heart. Further, the values obtained by formula are similar to those obtained by Einthoven triangle.

**Corresponding address:** Vishnu Priya H, No: 2, II floor, I main road, Bharathidasan Nagar, Mudaliarpeta, Pondicherry – 605004, Mobile no.: 9789197637, **Email:** drvishnupriya@yahoo.com

### Anti-Epileptic Activity of *Terminalia chebula* and *Cyperus rotundus* Extracts In Rats

P371

Vivek Sharma\*, Janardhan Singh

Department of Pharmacology, Pandit BD Sharma PGIMS, Rohtak.

**Aims:** To study anti-epileptic activity of *Terminalia chebula* and *Cyperus rotundus* in rats.

**Objectives:** To evaluate effect of *Terminalia chebula* and *Cyperus rotundus* extracts (aqueous and alcoholic) on audiogenic seizures in rats.

**Methods:** Technoaudiogenic chamber was used to produce seizures. Initially rats were subjected to audiogenic stimulus and time to appear convulsions was noted for each animal. Rats showing convulsions were selected. Albino rats weighing (125-150 g) of either sex were divided into 5 groups of 10 each. Gp I received aq. extract of *Terminalia chebula* (100 mg/kg, p.o); Gp II received alcoholic extract of *Terminalia chebula* (100 mg / kg, p.o); Gp III received aq. extract of *Cyperus rotundus* (200 mg / kg, p.o); Gp IV received alcoholic extract of *Cyperus rotundus* (200mg/kg, p.o); Gp V received Phenytoin (135 mg/ kg, i.p), as standard for comparison. Percentage protection was calculated before and after administration of herbal extract.

**Results:** Both aqueous and alcoholic extract of *Terminalia chebula* and *Cyperus rotundus* protected the rats against audiogenic seizures. Percentage protection observed with aqueous extracts in Gp I and Gp III was and, whereas percentage protection with alcoholic extracts in Gp II and Group IV was and respectively.

**Conclusions:** Aqueous and alcoholic extract of *Terminalia chebula* and *Cyperus rotundus* protect the rats against the audiogenic seizures.

**Corresponding address:** Dr Vivek Sharma, Associate Professor, Pharmacology, PGIMS, Rohtak-124001, Haryana, E-mail address: viveksharmapgimsrohtak@gmail.com

## Assessment of body composition parameters and their association with $VO_{2max}$ in adolescents

Vivek Kumar Sharma<sup>1</sup>, Senthil Kumar S<sup>1</sup>, Vinayathan A<sup>2</sup>

P372

<sup>1</sup>Department of Physiology, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry; <sup>2</sup>Principal, JawaharNavodayaVidyalaya, Kalapet, Pondicherry

**Aims:** Anthropometry is easily obtainable, inexpensive, and noninvasive method that reflects body composition and  $VO_{2max}$  indicates physical fitness.

**Objectives:** There is a paucity of data on the age related changes in the body composition parameters and  $VO_{2max}$ , and the association between them in the adolescent population

**Methods:** Present study was conducted on 335 adolescents (Boys = 188, Girls= 147) in the age group of 12-17 years as a collaborative study between department of Physiology, Jawaharlal Institute of Postgraduate Medical Education and Research and JawaharNavodayaVidyalaya, Pondicherry. Body composition was assessed using anthropometric measures (Height, weight, BMI, waist circumference, hip circumference and skin fold thickness) and cardiorespiratory fitness (CRF) was assessed using estimated  $VO_{2max}$  from Rockport Walk Fitness Test.

**Results:** Anthropometric measures were normal for the respective age groups and  $VO_{2max}$  (mL/kg/min) in all the age groups in both the genders were in superior category according to Heywood classification. CRF showed a strong correlation with FFM ( $r=0.891$ ,  $p<0.001$ ) and a weak correlation with BF% ( $r=-0.322$ ,  $p<0.0001$ ).

**Conclusions:** Optimal body composition and CRF can be attributed to the regular structured physical activity of one hour duration daily and the provision of adequate nutrition. FFM can be put forth as a stronger determinant of CRF than BF% in the adolescents.

## A comparative study of peak oxygen consumption in smokers and non smokers.

Vivek P, Thejaswini K.O, Basavaraju K

P373

Department of Physiology, Sri Siddhartha Medical College, Tumkur, Karnataka, India

**Background:** In India smoking is a common habit prevalent in both urban and rural areas. Cigarette smoking is a major risk factor for many cardiorespiratory disease.  $VO_{2max}$  is internationally accepted parameter to evaluate cardiovascular fitness

**Aims:** The study intends to evaluate the  $VO_{2max}$  in cigarette smokers and age and BMI matched non smokers.

**Objectives:** To study the  $VO_{2max}$  in smokers, to study the  $VO_{2max}$  in nonsmokers and to compare the  $VO_{2max}$  in smokers and non smokers.

**Methods:** This is a case control study having a total of 100 male subjects, 50 cigarette smokers (cases) and 50 non smokers (controls) in the age group of 25-35 years. Cardiorespiratory fitness in terms of  $VO_{2max}$  was assessed by following the protocol of Queen's College Step Test (QCT).

**Results:** Results were compared with the help of student t test. The mean  $\pm$ SD of  $VO_{2max}$  (ml/kg/min) in cigarette smokers was  $33\pm 4.32$  and in non smokers was  $39.91\pm 6.75$ . There was a significant decrease in  $VO_{2max}$  in cigarette smokers ( $p<0.01$ ) compared to non smokers.

**Conclusion:** The results suggest the striking effect of cigarette smoking on cardiorespiratory functions. In our study smokers showed significant reduction in peak oxygen consumption ( $VO_{2max}$ ) compared to non smokers. The decreased  $VO_{2max}$  is due to the CO-saturation of the blood.



Keywords: Peak oxygen consumption,  $VO_{2max}$ , Cardiorespiratory fitness, QCT

**Corresponding address:** Dr. Vivek.P, Department of Physiology, Sri Siddhartha Medical College, Tumkur, Karnataka. Email :vivek\_p07@yahoo.co.in

### **Influence of Lean Body Mass Index versus that of Fat Mass Index on Blood Pressure of Gujarati Indian School going Adolescents**

P374

Vivek Verma

**Aims and Objectives:** The purpose of this study was to determine that which portion of the body mass index, fat or fat free mass index is more influencing the blood pressure in Gujarati Indian adolescents.

**Methods:** 733 schoolchildren of 10-18 years of both genders were chosen for this study. The body fat percentage and blood pressure were measured and on the basis of body mass and fat mass, fat free mass index and various other indices were calculated. The association of fat mass index and fat free mass index with blood pressure was computed using correlations.

**Results:** The relationship of BMI with mean blood pressure of boys ( $R = .326$ ) was more strong than that in girls ( $R = .149$ ). The blood pressure was having more strong positive correlation with lean body mass index than that with fat mass index in all subjects ( $R = 0.230$  versus  $R = 0.184$ ), boys ( $R = 0.285$  versus  $R = 0.242$ ), & girls ( $R = 0.179$  versus  $R = -0.081$ ).

**Conclusion:** Fat free mass index has more strong association with blood pressure than fat mass index in the adolescent population irrespective of gender.

**Keywords:** Body fatness, Fat mass index, Fat free mass index, Blood pressure, Adolescents

**Corresponding address:** Vivek Verma, Professor, Department of Physiology, Chirayu Medical College, Bhopal (Madhya Pradesh) -462030 email: vermavivek2002@gmail.com

### **Admission to Medical Colleges - predictive validity of selection criteria.**

P375

Vrushali R Parate,\* Sushma S Pande

**Aims & Objectives:** To study the predictive value of entrance test & HSC marks on the performance of medical students in I MBBS University Examination

**Methods:** This was an Analytical Retrospective study carried out in a private medical college, Dr. PDMMC, Amravati. The base line data of students who got admission during year 2009 was collected from the records, documents submitted at the time of admission and verified from the original record. Three main variables studied were - 1) marks obtained in Physics, Chemistry & Biology in HSC (HSC-PCB) 2) Entrance marks 3) Marks obtained in I MBBS University examination. Data was analyzed using SPSS version-16. Pearson's Correlation Coefficient was used to find out correlation between HSC-PCB marks, entrance test marks & I MBBS University exam marks.

**Results:** No significant correlation ( $P > 0.05$ ) was seen between Entrance Marks & I MBBS University exams marks as well as between HSC-PCB & Entrance marks. But significant correlation ( $P < 0.05$ ;  $r = 0.443$ ) was seen between HSC-PCB & I MBBS University exam marks.

**Conclusion:** During admission procedure to medical colleges, along with entrance marks, some weightage should be given to HSC-PCB marks as they reflect the performance of students in I MBBS University exams.

**Corresponding author :** Dr. Vrushali R Parate, Dr. V R Parate, Assistant Prof., Dept. of Physiology, Dr. PDMMC, Amravati, Maharashtra – 444603. **Fax number :** 0721-2661742 **Email address :** vrushali.parate@gmail.com

## **Arterial Blood Pressure is Inversely Associated with Vascular Reactivity to Sympathetic Stress in Gujarati Indian Adolescents**

P376

**Wasim Shaikh, Hasmukh Shah, Archana Nimbalkar, Nilesh Patel, Minal Patel & SK Singh**

Dept. of Physiology, Pramukhswami Medical College, Karamsad, Gujarat.

**Objectives:** As ethnic differences exist in the aetiopathogenesis of hypertension, the current study was conducted with the objective to learn how vascular reactivity to sympathetic stress is associated with blood pressure profile in Gujarati Indian adolescents.

**Methods:** A cross-sectional study was conducted on 651 Gujarati Indian adolescents (285 girls, 366 boys) of age group 13 -19 years. Arterial blood pressure was measured in sitting posture by oscillometry and sympathetic vascular reactivity (Percentage rise in Diastolic Blood Pressure, %RDBP) was assessed using isometric handgrip test. Pearson's correlation coefficient was used to study the association between Blood Pressure and %RDBP.

**Results:** In girls, % RDBP showed significant ( $P<0.05$ ) negative relationship with resting SBP, DBP and MAP ( $r: -0.35, r: -0.47, r: -0.46$ ). In boys also, %RDBP showed a significant ( $P<0.05$ ) negative relationship with resting SBP, DBP and MAP ( $r:-0.24, r: -0.44, r: -0.39$ )

**Conclusions:** In Gujarati Indian adolescents, arterial blood pressure is inversely associated with vascular reactivity to sympathetic stress. The study thus reveals that enhanced sympathetic reactivity may not be a causative mechanism for development of Prehypertension or Hypertension in this population.

**Keywords:** Gujarati Indian Adolescents, Blood Pressure, Isometric Handgrip Test and Vascular Reactivity

**Corresponding address:** Dept. of Physiology, Pramukhswami Medical College, Karamsad-388325, Gujarat, India. E-mail: drwasimsh@gmail.com

## **Prevalence of prehypertension and its relation with food habits in medical students in navi mumbai**

P377

**Yashoda R Kattimani, Mahantayya V Math, Rita M Khadkikar, Sanhita R Walawalkar and R S Inamdar**

**Aims and Objectives** – To study the prevalence of prehypertension and to study the association of dietary habits and blood pressure in medical students in Navi Mumbai.

**Materials and method-** This study has been conducted in Physiology department. The institutional ethical committee permission was obtained. 42 students with age 18 to 25 years were included in the study. Written Informed consent was taken. Detailed history of diet with 'food frequency questionnaire' and general history of personal habits (Smoking, Alcohol consumption, and other habits) was taken. Measurement of height ( cms) and weight (kgs) was recorded and BMI was calculated. Resting BP was recorded after 10 minutes of rest in supine position from left arm with Omron digital sphygmomanometer.

**Results** – The data was analysed and results were presented as mean  $\pm$  SD. Out of 42 subjects, 26 (62%) were normotensive and 16 (38%) were prehypertensive. The mean SBP, DBP, Pulse of normotensive group were  $106.36\pm 6.17$  mmHg,  $61.77\pm 7.3$  mmHg,  $71.61\pm 7.44$  beat/min and the BMI was  $21.77\pm 3.01$ . The mean SBP, DBP,

Pulse of prehypertensive group were  $125.73 \pm 4.62$  mmHg,  $71.00 \pm 7.91$  mmHg,  $74.09 \pm 10.62$  beat/min and the BMI was  $26.48 \pm 5.43$ . There was positive correlation between blood pressure and extra salt intake, intake of fats, soft drinks and negative correlation with fruits and vegetable intake.

**Conclusion** – This study has been conducted on 42 young adults with age 18 to 25 years. The prevalence of prehypertension was 38%. There was positive correlation between blood pressure and extra salt intake, intake of fats, soft drinks and negative correlation with fruits and vegetable intake.

**Corresponding address:** Dr.Yashoda R Kattimani, Department of Physiology, M.G.M. Medical College, Kamothe, Navi Mumbai, Email id: yashoda.ravindra@yahoo.com

## Role of walnut consumption, aerobic exercises and meditation in reliving symptoms of dysmenorrhoea in young healthy medical students.

P378

**Yogesh Kumar\***, Chaudhary Lalita<sup>a</sup>, Reena Srivastava

Department of Physiology, AIIMS, Patna and Department of Physiology LLRM Medical College, Meerut

**Objectives:** (1) To check efficacy of aerobic exercise, meditation and walnut consumption in dysmenorrhoea. (2) To find method to reduce sickness absenteeism.

**Study design:** Randomised control trial was conducted.

**Methods:** Ninety dysmenorrhoeal students (based on VAS score and Menstrual distress questionnaire ) in the age group of 17-25 from medical and nursing students of two medical colleges were selected and randomly divided into three groups A, B and C. Group A performed aerobic exercises, Group B performed meditation and group C were given 20gm of walnut each day. VAS score was taken during each cycle for three consecutive cycles.

**Results:** After three cycles the entire three groups showed reduction in symptoms based on VAS score but reduction in symptoms was much more in case of students. Three groups were compared using ANOVA test. Group C showed most significant decrease in VAS score ( $p < 0.001$ ) followed by exercise group ( $p < 0.05$ ) and meditation group showed least reduction ( $p > 0.05$ ).

**Conclusions:** By decreasing the severity of dysmenorrhoeal symptoms walnut consumption along with aerobic exercises can reduce sickness absenteeism and increase performance of medical professionals.

## Evaluation of intraocular pressure in healthy subjects

P379

**Yogesh MK<sup>1</sup>**, Venkatesh D<sup>2</sup>, Guptha CN<sup>3</sup>

<sup>1</sup> Dept of Physiology, Karpagam Faculty of Medical Science and Research, Coimbatore; <sup>2</sup>Dept of Physiology, M.S.Ramaiah Medical College, Bengaluru; <sup>3</sup>Dept of Ophthalmology, M.S.Ramaiah Medical College, Bengaluru.

**Aim:** To evaluate the gender difference in resting Intraocular pressure (IOP) and to compare the IOP in right and left eye.

**Objective:** Intraocular pressure is an important factor influencing health and disease of eye. IOP is likely to be changed by number of factors. Effect of gender and difference between right and left eye on IOP is evaluated in this study.

**Methods:** IOP was measured in both the eyes for 65 males & 37 females by Goldmann's applanation tonometry. Applanation tonometry was done under topical anesthesia using a slit lamp with a cobalt blue filter. The IOP was

measured in right & left eyes independently with a time interval of 15 min between 2 recordings. The values were expressed as mean  $\pm$  SD, analyzed by 't' test.  $P < 0.05$  was considered significant.

**Results:** The resting IOP in males for the right & left eye were  $13.74 \pm 1.67$  &  $13.46 \pm 1.65$  mm Hg. The corresponding values for females were  $13.22 \pm 1.47$  &  $12.81 \pm 1.48$  mm Hg respectively.

**Conclusion:** IOP was higher in right eye when compared to left eye in both males and females. The difference was statistically significant in females. Males had a higher IOP in both the eyes when compared to the corresponding eyes in their female counterparts. However, the difference between males & females in left eye was statistically significant.

### A comparative study of lung functions in sugarcane factory workers.

P380

**Yogita Khade, Shrilaxmi Bagali, Pallavi Kanthe, Manjunatha Aithala**

Department of Physiology, Shri B. M. Patil Medical College Hospital & Research Centre, BLDE University, Bijapur, Karnataka.

**Aims & Objectives:** A study to assess the lung functions in asymptomatic sugarcane industry workers and their correlation with duration of exposure to the dust.

**Materials & Methods:** A comparative and cross sectional study was conducted among age matched sugarcane factory male workers exposed to sugarcane dust (with minimum duration of exposure 5 years), cases ( $n=60$ ) and controls ( $n=60$ ) aged 25-50 years. The pulmonary function tests were studied with recording Spirometer/Spiropac (MEDICAID). Anthropometric parameters like height (cm), weight (Kg), BMI ( $\text{Kg}/\text{m}^2$ ) recorded. Lung function parameters FEV1, PEFr, FEF25-75% were recorded. Statistical analysis was done using Student's 't' test and correlation was done by using Pearson's correlation.

**Results:** A significant reduction in PEFr ( $p=0.000$ ), FEV1 ( $p=0.04$ ) and insignificant reduction in FEF25-75% ( $p=0.40$ ) among cases and controls were recorded. An insignificant negative correlation between FEV1, PEFr, FEF25-75% with duration of exposure. FEV1 ( $r = -0.14$ ,  $p = 0.26$ ), PEFr ( $r = -0.10$ ,  $p = 0.42$ ), FEF25-75% ( $r = -0.07$ ,  $p = 0.58$ ).

**Conclusions:** It may be concluded that the reduction in lung function parameters is suggestive of obstructive changes in sugarcane factory workers.

**Key Words:** Lung function parameters, obstructive changes.

**Corresponding address:** Department of Physiology, Shri B. M. Patil Medical College Hospital & Research Centre, BLDE University, Bijapur, Karnataka. Phone No-9739374039. E-mail id-dryogitakhade@gmail.com

### A study of autonomic function tests between in postmenopausal women

P381

**S.Waheeda and R.D.Desai**

Corresponding address: Dept. of Physiology, Vinayaka mission's kirupananda variar medical college, NH 47, sankari main road, Seeragapadi, Salem 636308. Tamil nadu.

**Background & objective:** Menopause is a normal aging phenomenon in women consists of gradual transition from the reproductive to the non-reproductive phase. Certain autonomic changes have also been reported during postmenopausal women, particularly the influence of hormonal effects on the blood pressure and cardiovascular system. Hence the current Study was undertaken to study the autonomic function tests in post menopausal women.

**Materials & methods:** The present study was conducted in the Department of Physiology, Navodaya Medical College, Raichur on fifty premenopausal subjects of age group between 40 to 55 years. The healthy Post menopausal women were subjected to five autonomic tests; Blood pressure in different positions, Valsalva maneuver test, Hand Grip test, cold Pressure test and E.C.G.

**Results:** The mean values of R-R interval in post menopausal women were found there was no significant change in heart rate & systemic blood pressure.

**Conclusion:** By using multiple parameters after assessing both the components of autonomic nervous system, it was found that no significant change in heart rate and systolic blood pressure.

**Key words:** Autonomic Nervous System, Blood pressure, Valsalva maneuver tests, Hand grip test, Cold pressure test, E.C.G.

### Correlation of body mass index (BMI) with blood pressure (B.P) in medical students.

Zaki Shaikh, Seema Pawar

P382

**Aims and Objectives:** To examine the correlation of body mass index (BMI) with blood pressure (B.P) in medical students.

**Materials and Methods:** A total of 150 students in age group of 18 to 25 years were included in the study. After thorough clinical examination, height and weight were recorded and Body Mass Index (BMI) was calculated using Quetelets Index. According to BMI, the subjects were divided into Normal (BMI 18.50 to 24.99) and Overweight (BMI >\_25.00) groups. Systolic and Diastolic blood pressures were recorded in left arm in sitting position with standard sphygmomanometer by auscultatory method, a mean of three recordings was calculated and included in the analysis. Data analysis was done by SPSS software; unpaired t-test was applied.

**Results:** There was a statistically increase in systolic and diastolic blood pressures in overweight males and females (p Value < 0.05).

**Conclusions:** A positive correlation of systolic and diastolic blood pressure with respect to BMI in both sexes was observed.

**\Corresponding address:** Dr. Zaki Shaikh, Department of Physiology, 3 rd floor college building, L.T.M.M.C. & G.H, Sion, Mumbai.400022.

### Restoration of stress-induced cognitive deficits and impaired hippocampal synaptic plasticity by Jyothishmati oil (*Celastrus paniculatus* Willd) treatment

Bhagya V and Shankaranarayana Rao BS

P383

Department of Neurophysiology, National Institute of Mental Health and Neuro Sciences (NIMHANS), Hosur Road, Bengaluru - 560 029, India

**Introduction:** Stress often precludes or exacerbates the development of existing symptoms of affective disorders, including major depressive disorder. Previous studies have shown that repeated stress can induce persistent morphological and electrophysiological changes in the hippocampus resulting in cognitive impairment. In addition, we have demonstrated that repeated stress causes decreased neurogenesis in the hippocampus. Traditional medicines have been widely employed for centuries, and they remain one of the important sources for the discovery of new bio-active compounds to treat affective disorders. *Celastrus paniculatus* (CP) Willd known as "the elixir of life" is used clinically to treat cognitive deficits and memory impairment in children and is known to modulate cholinergic activity.

**Aims and Objectives:** Accordingly, in the present study, we examined whether CP treatment after stress could ameliorate the stress-induced decrease in hippocampal long-term potentiation (LTP) and impaired spatial learning and memory in radial arm maze (RAM) task.

**Methods:** Male Wistar rats were subjected to restraint stress for 21 days (6h/day). Following stress, rats were treated with two doses of CP oil.

**Results:** We observed that chronic restraint stress impaired learning and memory in RAM and also impaired hippocampal LTP. Strikingly, defective LTP, impaired spatial memory associated with chronic stress was normalized by CP treatment.

**Conclusions:** Thus, our study indicates that alternative approaches like natural compounds can be effectively used to treat stress and stress-associated disorders. Our results open up the possibility of developing novel strategies to enhance synaptic plasticity as a means of treating a variety of psychiatric diseases, including depression.

**Key Words:** Chronic stress, cognitive deficits, spatial learning and memory, synaptic plasticity, long-term potentiation, *Celastrus paniculatus*, affective disorders

**Acknowledgements:** Authors acknowledge the financial support from the CSIR, DST, DBT and NIMHANS.

### **Concomitant enriched environment and antidepressants treatment restores depression-induced aberrant neuronal plasticity and impaired spatial learning**

P384

**Mahati Krishna, Bhagya V, Christofer Thomas, Raju TR and BS Shankaranarayana Rao**

Department of Neurophysiology, National Institute of Mental Health and Neuro Sciences, Bengaluru - 560 029, India

**Aims and Objectives:** Neuronal plasticity plays a vital part in the development and maturation of neuronal connections and is implicated in stress and major depression. Clinical and pre-clinical studies show that depression is associated with neuronal atrophy, maladaptive synaptic plasticity and reduced cellular resilience which may be responsible for a gamut of negative symptoms.

**Methods:** We studied spatial learning and memory, anxiety-like-behaviour, amygdalar and hippocampal volumes, and hippocampal CA1 long-term potentiation (LTP) in an animal model endogenous depression.

**Results:** Our results show that depressive-like animals have poor spatial learning, reduced LTP and hippocampal morphological abnormalities. These animals also exhibit enhanced anxiety-like behaviour and increased amygdalar volume which reiterates that neuronal plasticity is affected in depression. We also evaluated the effect of a short duration of enriched environment (EE) in combination with clinically sub-effective doses of the antidepressants, escitalopram or reboxetine. Neither EE nor the drugs had any effect on depression-induced dysfunctions. But, the combination of EE and antidepressants restored all depression-induced deficits.

**Conclusion:** We have demonstrated for the first time that EE and antidepressants can act in concert to ameliorate depression induced deficits. Further studies to understand underlying molecular mechanisms may help in developing therapeutic strategies for neuropsychiatric disorders.

**Key Words:** Depression, cognitive deficits, spatial learning and memory, abnormal synaptic plasticity, long-term potentiation, antidepressants, enriched environment

**Acknowledgements:** Authors acknowledge the financial support from the CSIR, DST, DBT and NIMHANS.

## Chronic reboxetine treatment restores stress-induced behavioural depression, anxiety and spatial learning deficits

P385

Shilpa BM, Christofer Thomas, Raju TR and BS Shankaranarayana Rao

Department of Neurophysiology, National Institute of Mental Health and Neuro Sciences, Bengaluru - 560 029, India

**Aims and objectives:** Chronic stress results in cognitive deficits including anxiogenesis and depressive symptoms. The neural basis of amelioration of these deficits is not completely understood. Accordingly, we evaluated the role of antidepressant drug, reboxetine (a noradrenergic reuptake inhibitor) on chronic stress-induced cognitive deficits.

**Method:** Male Wistar rats were subjected to chronic immobilization stress (CIS) (2 hr/day) for 10 consecutive days. Rats were treated with reboxetine for 14 days. Behavioural depression was assessed by sucrose preference and force swim tests, anxiety-like behaviour by open field test and elevated plus maze. Volumetric alterations in dentate gyrus (DG), hippocampus and basolateral amygdala (BLA) were analysed using unbiased stereological procedures. Spatial learning and memory was assessed by partially baited radial arm maze (RAM) task.

**Results:** CIS resulted in depressive-like behaviour, atrophy of the hippocampus and DG, and hypertrophy of BLA. Reboxetine treatment ameliorated behavioural depression, spatial learning, and partially restored volumes of the hippocampus and DG. Interestingly, reboxetine did not have any effect on BLA hypertrophy and anxiety-like behavior.

**Conclusion:** Our present study demonstrates that chronic antidepressant treatment can restore behavioural depression, spatial learning deficits.

**Key Words:** Chronic stress, anxiety, depression, spatial learning and memory, stereology, antidepressant therapy

**Acknowledgements:** We acknowledge the financial support from the CSIR, DST, DBT and NIMHANS.

## Inactivation of basolateral amygdala prevents chronic stress-induced learning and memory deficits

P386

Tripathi SJ, Christofer Thomas, Raju TR and B S Shankaranarayana Rao

Department of Neurophysiology, National Institute of Mental Health and Neuro Sciences, Bengaluru - 560 029, INDIA

**Aims and objectives:** Chronic Stress causes deleterious effect on learning and memory and integrity of prefrontal functions. Stress responses are known to be differentially regulated by the hippocampus, prefrontal cortex and amygdala. Chronic stress causes hypo-functioning of the hippocampus and prefrontal cortex, whereas, hyper-functioning of the amygdala. Accordingly, the current study was designed to investigate the role of temporary inactivation of basolateral amygdala (BLA) during stress on chronic stress-induced cognitive functions.

**Methods:** Rats were subjected to temporary inactivation of BLA prior to chronic immobilization stress. Stress induction was assessed by measuring body weight gain, adrenal and spleen weights, and gastric ulceration. Prefrontal dependent spatial learning and memory was evaluated using novel object recognition, novel object location and partially baited radial arm maze tasks.

**Results:** Our results showed that BLA inactivation significantly prevented stress-induced insufficiencies in body, adrenal and spleen weights, and gastric ulceration. Further, BLA inactivation prevented stress-induced deficits in prefrontal dependent learning and memory tasks.

**Conclusions:** Our study provides conclusive evidence that BLA inactivation during stress prevents stress-induced prefrontal cortical dependent cognitive deficits.

**Keywords:** Chronic stress, spatial learning and memory deficits, prefrontal cortex, Inactivation of basolateral amygdala

**Acknowledgements:** Acknowledge the financial support from DBT and NIMHANS

## **Differential effects of enriched environment and anti-epileptic drug on epilepsy-induced anxiety, depressive-like behaviour and spatial learning deficits**

P387

**Vrinda M, Arun S, Bindu M. Kutty and B.S Shankaranarayana Rao**

Department of Neurophysiology, National Institute of Mental Health and Neuro Sciences, Bengaluru - 560 029, India

**Aims and objectives:** Temporal lobe epilepsy (TLE) is the most common form of focal epilepsy and is often intractable. Cognitive impairments are the hallmark of TLE, but are often associated with comorbid conditions like anxiety and depression. Accordingly, in the present study we have used a rat model of chronic TLE to assess the spatial learning and memory, and also to evaluate the impact of anxiety and depressive-like behaviour. Further, the role of enriched environment (EE) and anti-epileptic drug (AED), levetiracetam on epilepsy-induced behavioural deficits was evaluated.

**Methods:** Male Wistar rats of 200-250g were used for the study. A chemoconvulsant model of TLE using lithium-pilocarpine was established and the induction of status epilepticus (SE) was characterized by hippocampal and cortical electroencephalography, and behavioural grading of seizures. Those animals that showed spontaneous recurrent seizures by 35-40 days post SE were included in the study. The epileptic animals with respective controls were assessed for spatial learning and memory in Morris water maze (MWM); anxiety-like behaviour in elevated plus maze (EPM) and open-field test (OFT); and depressive-like behaviour using forced swim test (FST) and sucrose preference test (SPT). Those animals that exhibited spontaneous recurrent seizures were subjected to either EE exposure (6h / day) or levetiracetam for 14 days.

**Results:** Epileptic rats travelled more distance in the OFT. In the EPM, these rats tend to spend less time and made fewer entries in the closed arms and spent more time in the open arms with increased number of head dips compared to normal rats. Altered behaviours in OFT and EPM indicate that epileptic rats are hyperactive. This hyperactive behaviour improved in EE exposed epileptic rats, while the levetiracetam treated rats did not improve much. Epileptic rats exhibited depressive-like behaviour in SPT and which was restored by exposure to EE, whereas levetiracetam treatment worsened the condition. Epileptic rats showed impaired spatial learning and memory by displaying increased latency to reach the hidden platform, spending less time in the target quadrant, increased thigmotactic behaviour, and increased distance travelled in the MWM. Levetiracetam treated epileptic rats showed complete restoration of cognitive impairment, whereas EE exposed rats showed partial restoration.

**Conclusion:** Temporal lobe epilepsy induced behavioural changes such as hyperactive behaviour and depressive-like behaviour was restored by chronic exposure to EE, while impaired spatial learning was only restored by levetiracetam. Thus, social enrichment as a non-pharmacological therapy may potentiate the effect of AEDs by improving the epilepsy-induced co-morbid behaviour and cognitive deficits. Hence, treatment strategies could be designed with non-pharmacological interventions that utilize components of EE combined with AED.

**Key Words:** Temporal lobe epilepsy, cognitive deficits, spatial learning and memory, anxiety and depression, spontaneous recurrent seizures

**Acknowledgements:** Authors acknowledge the financial support from the CSIR, DST, DBT and NIMHANS.



## Early maternal separation during stress hyporesponsive period evokes age-dependent changes in retention and extinction of fear memory in male wistar rats

Pradeep K Mishra, Bindu M Kutty and T Rao Laxmi

Department of Neurophysiology, NIMHANS, Bengaluru

P388

**Aim:** Age dependent changes in fear memory and fear extinction was assessed following early maternal separation and isolation stress in male Wistar rats.

**Objectives:** Study the behavioural correlates of early maternal separation induced changes in fear retention and extinction across age groups.

**Methods:** Rats were subjected to the maternal separation and isolation stress (EMS) during the Stress Hypo Responsive Period (SHRP) (6h/daily, 10 days), while outcomes of early life stress on fear retention and fear extinction was tested in 2 months and 1 year old rats. After EMS, rats were subjected to cued fear conditioning session. 24, 48 and 72 hours after fear conditioning, both groups of rats received extinction test sessions respectively. Percent freezing was assessed during all stages of fear extinction training. 10 days after fear extinction training, retention of fear extinction was tested.

**Results:** The retention of fear memory was stronger in EMS rats than controls across the age groups. But the retention of fear memory was much better in 2 months as compared to 1 year old rats. The EMS rats acquired more rapidly on the fear extinction when compared to the controls, while, the retention of extinction of fear memory was compromised in EMS rats showing increased freezing to the conditioned stimulus than controls which was similar across the age groups.

**Conclusions:** Exposure to early maternal separation and isolation stress elicits age dependent changes in fear memory and extinction.

**Acknowledgments:** CSIR, ICMR and NIMHANS for the financial support.

**Corresponding Author:** Laxmi T Rao, Department of Neurophysiology, NIMHANS, Bengaluru 560 029; Email: laxmir@gmail.com or trlaxmi@nimhans.kar.nic.in

## Circadian rhythm of Peak Expiratory Flow Rate (PEFR) in healthy young adults.

PANTA MANOJ, MISRA N.K

Nepal

P389

**Aims and Objective: (1)** To measure and determine the normal value of PEFR in young healthy adult. **(2)** To study the circadian rhythm of PEFR in males. **(3)** To correlate the relationship of PEFR with sex, height, weight, BMI, WHR.

**Methods:** The PEFR was measured with Wright's portable peak flow meter at 7:00, 12:00, 17:00, 21:00, 01:00 hours in 140 healthy male subjects. The PEFR was measured at 07:00 A.M only in 93 healthy female subjects. The diurnal variation of PEFR was studied only in male subjects.

**Result and Conclusion:** Diurnal variation for individual subject was calculated using amplitude percent mean (A%M). The average A%M of 140 subjects was  $6.15 \pm 1.72$ . PEFR tends to increase from morning at 07:00 hour till evening 17:00 hour, after which there was a progressive fall in PEFR levels, till morning 07:00 hour. Finally, a prediction equation was established by which PEFR of healthy adult of 18 to 24 years age can be estimated from height, waist hip ratio and body mass index.

**Intraocular Pressure among healthy individuals****Dhawan Ashwani & Love Watta** Department of Physiology MAMC AgrohaHisar**Aims:-** To know the distribution of intraocular pressure among healthy population.**Objectives:-** Implications of Intraocular pressure in development of glaucoma.**Methods:-** Intraocular pressure of the subjects above 21 years of age was measured after local eye examination and subjects with active eye disease or on treatment for glaucoma were excluded from the study. IOP was measured under local anesthesia 2% Xylocane with Schiötz tonometer.**Results:-** IOP ranges from 9.2 to 24.1 mmHg and mean IOP was  $15.73 \pm 2.86$  mmHg. The mean IOP for younger population is low as compared with people above age of 41 years. Increase in IOP was not significant comparing age group 21-30 years and 31-40 years ( $p > 0.05$ ) and after that comparison between 41-50 years and 51-60 years the increase was significant ( $p < 0.001$ ) further mean IOP fall among the subjects above 71 years**Conclusions:-** IOP increases with age and this age related increase is statically significant after the age of 41 years. Public at large in India is ignorant about glaucoma or Kala motia and warning signal is increase in IOP. As glaucoma is a disease of insidious onset and best suited to preventive measures. So this study suggests a complete eye check up especially for IOP after the age of 41 years**A COM PARATIVE STUDY OF MOTOR AND SENSORY COMPONENTS OF MEDIAN NERVE CONDUCTION IN HYPOTHYROID PATIENTS****Rowena Victor, Balasubramanian Kabali.**

Department of Physiology, Stanley Medical College

**BACKGROUND:** Neurologic complications, especially polyneuropathy in overt hypothyroidism ranges from 42 to 72%. The severity of the peripheral nerve lesion is significantly related to the duration of hypothyroidism. However hypothyroid patients presents with a sensory-motor polyneuropathy with a distal-proximal progression. Recently nerve conduction studies are most commonly used in neurophysiological laboratories in assessing the diseases of the peripheral nerve. This study is done to assess the early nerve lesion in hypothyroid patients.**OBJECTIVE:** To compare the latency, amplitude, conduction velocities of motor and sensory components of Median nerve in hypothyroid patients with that of normal individuals.**MATERIALS AND METHODS:** With ethical committee approval, 30 hypothyroid patients and 30 age-sex matched controls of age groups 18-40 years were included in the study. After obtaining Informed written consent, detailed clinical examination, the study group was subjected to nerve conduction study. Supramaximal stimulation was given with the cathode was placed 3 cm proximal to the distal wrist crease at wrist and at elbow near the volar crease in antecubital region, where the anode was proximal. Distance between stimulating and recording electrode was measured and sensory nerve conduction velocity was calculated. The latency difference, amplitude and conduction velocity were noted and the data was analyzed with SPSS 16.0 version.**RESULTS:** There is a significant delay in latency (SDL) and decrease in amplitude in both the sensory and motor component of median nerve ( $p < 0.05$ ). Highly significant decrease in conduction velocity with minimal difference in the sensory and motor component of median nerve ( $p < 0.05$ ) has been observed.

**CONCLUSION:** Significant prolonged latencies ,reduced amplitude and nerve conduction velocity before appearance of neurological symptoms reveal that might be due to a mononeuropathy due to primary involvement or secondary to compression caused by mucinous deposits. These findings suggest that a considerable number of untreated hypothyroid patients may have preclinical asymptomatic small fibre peripheral neuropathy.