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Indian Journal of Physiology and Pharmacology

ABSTRACTS

Invited Guest Lectures

Physiology of blood coagulation classical, cascade and beyond.

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Blood is a liquid connective tissue and is extremely important for providing oxygen, removing the products of catabolism, carrying mutation to different tissues in a multi cellular organism facilitating crosstalks between various organs through a series of short and long distance chemical messengers. Blood clots whenever there are injuries to the blood vessels .Clotting or coagulation of blood is a complex process and there are many proteins in circulation which inhibits or facilitate blood coagulation.

In the classical theory of blood coagulation it was envisaged that on injury thromboplastin is liberated and this thromboplastin eventually cause fibrinogen to become fibrin, the blood clot. Platelets provide phospholipid and localize the clot through primary hemostasis.

This theory was in vogue till 1962 but the theory was not able to explain several observations on blood coagulation. Between 1962-64 from both sides of the Atlantic a cascade or water fall theory of blood coagulation was suggested. In this, coagulation was seen as a bipartite system with intrinsic pathway and extrinsic pathway of thromboplastin generation.

This thromboplastin through a tenase complex pass through common pathway eventually producing a prothrombinase complex with assistance from activated factor V. This prothrombinase produce a potent blood clotting enzyme called thrombin by acting upon prothrombin present in plasma. This thrombin then converts circulating soluble fibrinogen into insoluble fibrin clot. In this scheme of things it become easy to explain blood coagulation and three screening test or blood coagulation i.e. APTT (Activated Partial Thromboplastin Time), PT (Prothrombin Time) and TT (thrombin time) were developed and along with platelet count these tests completed screening of coagulation system in an individual in a reasonably comprehensive manner but it could not detect factor XIII deficiency through these tests for which other tests were prescribed.

However use of various snake venoms from viper family and evaluation of different patients with congenital coagulation disorders and ability or inability to cross correct the coagulation defects by mixing each other's blood (Plasma) allowed scientists to dissect the coagulation system in a more comprehensive manner. Painstaking evaluation of these results led to discovery of many coagulation proteins and their interaction leading to fibrin clot.

The last in the cascade was detection of factor XIII which stabilized fibrin clot.

Very soon it was found that classical theory and cascade theory of blood coagulation cannot adequately explain why in the common congenital bleeding disorder i.e. Hemophilia A patient should bleed at all. Because according to cascade theory once coagulation is activated it should go all way up to thrombin and fibrin formation. Factor VIII defect does not come on the direct pathway of blood coagulation as both factor VIII and factor V are more cofactors.

As the coagulation physiology was getting elucidated between 1960 – 2000 many patients presented with thrombotic conditions which appeared to be inherited and investigation into the inherited thrombosis / hemorrhage led to discovery of natural Inhibitors of blood coagulation i.e. antithrombins, protein C, Protein S, and with the advent of molecular biology many mutations / polymorphisms of coagulant, anticoagulant and fibrinolytic proteins were discovered.

In the discovery India also took substantial initiative. However modern theory of blood coagulation started looking at coagulation process not only happening with plasma and platelets. Other formed elements of blood and endothelium also contributed to its development.

In the modern theory cells, plasmatic factors, flow, platelets are intimately associated with blood coagulation. In 1990's Rappaport and Bajaj described a protein called tissue factor pathway Inhibitor (TFPI) and this protein explained why factor VIII deficiency or defect or factor V deficiency or defect should cause bleeding.

Today it is believed that in vitro all blood coagulation is initiated by tissue factor from injured vessels complexing with active factor VII (VIIa) circulating in minimum quantity within the lipid part of plasma .Once tissue thromboplastin complexes with FVIIa the complex activates FIX and FX and through this process a small amount of thrombin is generated and then the activated factor X and IX gets immediate neutralized by TFPI. This small amount of thrombin then activates platelets and factor VIII and factor V. Thrombin in association with activated platelets now directly activate factor XI and the coagulation cascade is activated leading to burst of thrombin and positive feedback associated with the process.

Tissue factor, activated coagulation factors, thrombin all are serine proteases and are capable of activating many receptors on different types of cells in the body including certain neural cells. These receptors are called protease activable receptors (PAR).Increasingly many protease activable receptors have been described particularly those which are activated by thrombosis. These receptors using the coagulation enzyme drives cells to activation, growth, migration and secretion.

These are newer function of coagulation proteins and are involved in tissue regeneration, Chemotaxis and tissue repair.

Platelets which were originally thought to be an inert cells providing only negatively charged phospholipids to assist in blood clotting have now shown to secrete more than 30 different kind of proteins. Its various storage granules (Alpha, delta, lysosomal) etc., and secretary products from platelets could be coagulant proteins, adhesion molecules, growth factors, cytokines and chemokines, fibrinolytic enzyme as well as antifibrinolytic substances.

The effect of coagulation proteins in cell growth repair, memory ,activation of complements , prevention of spread of infection etc. have been demonstrated in various types of genetically engineered & knock in or knockout mice.

Some of the proteins like tissue factor was found to be absolutely essential for life. Genetic

knockout mice for tissue factor do not survive in uterus.

Hence though coagulation system was originally studied for its mechanism by which blood clots and bleeding stops. Modern biochemistry molecular biology and animal studies have shown its implication far beyond coagulation only. Blood coagulation embraces many of the vital functions of multitudes of cells and by doing so it become one of the vital interest to develop agonists and antagonists of different coagulation proteins and its mimics in the management of diverse disorders.

Symposium Abstracts

Symposium 1:- Reproductive Physiology

Speakers:

1. **Dr. Kiran Singh,** Asst. Professor, Dept. of Molecular and Human Genetics, B.H.U, Varanasi

Topic: Genetic players of human male fertility potential

2. **Prof. Shail K. Chaube,** Cell Physiology Laboratory, Dept. of Zoology, Institute of Science, B.H.U, Varanasi

Topic: Stress-mediated meiotic cell cycle arrest and apoptosis in oocytes

3. **Dr. Piyali Das,** Assistant Professor, Dept. of Physiology, Calcutta National Medical College, Kolkata.

Topic: Oxidative stress a newer aspect of male infertility

4. **Prof. Amit Kant Singh,** Department of Physiology, UPUMS, Saifai, Etawah

Topic: Role of multivitamins and micronutrients in treatment of azoospermia due to maturation arrest.

SRP/01

Genetic players of human male fertility potential

Kiran Singh[1], Deepika Jaiswal[2], Vertika Singh[1]

Spermatogenesis is complex multistep phenomenon which is required for the maintenance of male germline. The hallmark steps in production of male gamete are proliferation, meiosis and spermiogenesis. Infertility is a complex multifactorial phenotype and therefore both genetic and environmental factors play an important role in its pathophysiology. Our lab has been trying to understand the contribution of cytogenetic and molecular genetic risk factors associated with infertile phenotype. We have done cytogenetic analysis through blood culture and karyotyping in 480 infertile cases and found that 5.42% of the infertile patients had chromosomal anomalies' chromosome harbor candidate genes indispensable for spermatogenesis and these genes are mainly clustered in Azoospermia factor region (AZF) present on the long arm of the Y chromosome. We have screened 450 infertile patients excluding those with chromosomal abnormalities and found that 7.56% had deletion in the AZF region. Testicular histology was done from the biopsies of infertile men for genotype-phenotype correlation. Further association studies of several autosomal genes polymorphisms (*MTHFR C677T, A1298C, GSTT1* and *GSTM1, CBS, DAZL, IL1RN VNTR, FAS, FASL, GRTH* and *IL1B*); accounted for additional genetic factors responsible for male infertility in Indian population. However, aetiology of a large proportion of infertile men still remains unknown. We are looking at the sperm abnormilities in normozoospermic infertile cases and scored various abnormalities such as increased

oxidative stress, abnormal acrosome integrity and compromised mitochondrial membrane potential. We utilized the AffymetrixCytoScan 750K array characterized with more than 750,000 markers for copy number analysis to identify novel and common variants associated with impaired spermatogenesis cases. We have identified a common duplication in the 19p13.3 region and Yp11.2 region in infertile men harboring important genes known to play an important role in spermatogenesis. In addition we have also identified a common Deletion in 15q15.3 and 7q11.2 region in the same cohort associated with infertile phenotype. These genomic imbalances may serve as a contributing factor in generating an infertile phenotype by deregulating normal spermatogenic pathway. Further studies are required to determine the effect of these genomic imbalances at functional levels.

SRP/02

Stress-mediated meiotic cell cycle arrest and apoptosis in oocytes

Shail K. Chaube

Cell Physiology Laboratory, Department of Zoology, Institute of Science, Banaras Hindu University, Varanasi-221005; E-mail: shailchaubey@gmail.com

In most of the mammalian species including human, oocyte meiosis is a dynamic and very long process that involves several check points. The cell cycle arrest in oocyte occurs at various stages of meiosis such as diplotene, metaphase-I (M-I), metaphase-II (M-II), and so called metaphase-like arrest (M-III). Resumption of meiosis from diplotene-arrest is induced in response to pituitary gonadotropins surge and ovulated eggs are arrested once again at metaphase-II until fertilization. In the absence of fertilization, postovulatory aging induces exit from M-II arrest and eggs are once again arrested at M-III like stage due to incomplete extrusion of second polar body. Generation of a tonic level of reactive oxygen species (ROS) (under physiological range) is beneficial for meiotic resumption from diplotene-as well as M-II arrest, while overproduction of ROS or depletion of cellular anti-oxidants induce maturation promoting factor (MPF) stabilization, cytostatic factor (CSF) activity, reduces anti-apoptotic signaling pathway and activates pro-apoptotic signaling pathway leading to meiotic cell cycle arrest and apoptosis. Diplotene-arrested oocytes are more susceptible for ROS-induced apoptosis as compared to M-I, M-II and M-III stages of oocytes. Oocyte apoptosis is characterized by several molecular, biochemical and morphological changes in rat oocytes. The molecular and biochemical changes that are associated with oocyte apoptosis are increased intracellular hydrogen peroxide (H_2O_2) and nitric oxide (NO) levels, cytochrom c release from mitochondria, under expression of anti-apoptotic protein such as bcl-2, over expression of pro-apoptotic protein such as bax, caspase-9 and caspase-3 activities, and DNA fragmentation. These molecular and biochemical apoptotic changes result in the appearance of several morphological apoptotic features such as shrinkage, membrane blebbing, cytoplasmic granulation and fragmentation prior to degeneration. Indeed, oxidative stress induces meiotic cell cycle arrest and apoptosis in rat oocytes.

SRP/03

Oxidative stress, a newer aspect of male infertility

Dr. Piyali Das, Associate Professor, Physiology, Bankura Sammilani Medical College

Background: Oxidative stress is the imbalance between Reactive Oxygen Species (ROS) and antioxidant forces operating in any given system. Sperms containing more amount of poly unsaturated fatty acid in their membrane and low content of scavenging enzymes in their cytoplasm, are very much susceptible to oxidative stress. Membrane lipid undergoes peroxidation by such ROS producing toxic end products like Malondealdyhide (MDA) which can lead to loss of membrane integrity rendering the sperms nonfunctional. Thus it has come to light that,

oxidative stress is a major factor for the pathogenesis of male infertility as it affects many of the structural and functional aspects of spermatozoa. To explore the association between Oxidative stress and semen quality among the male counterparts of infertile couples.

Objectives:

- To assess the physical parameters like sperm concentration, sperm motility, sperm morphology in the semen samples of the male counterparts of infertile couples, sub grouping the ejaculates on the basis of physical quality into normal and abnormal groups.
- To assess sperm viability in the same group of subjects.
- To evaluate the oxidative stress by estimating Malondealdehyde (MDA- a marker of lipid peroxidation) and some Non-enzymatic Antioxidants namely- Ascorbic acid (Vit C),Uric acid, Reduced Glutathione in seminal plasma of the same subjects
- To explore the correlation between oxidative stress markers and different seminogram parameters e.g. sperm concentration, sperm motility, sperm morphology, sperm viability.
- To compare the percentage of viable sperms and extent of oxidative stress in normal and abnormal ejaculates

Material and Methods: Semen samples were obtained from 147 male patients of 21-50 years of age attending the Reproductive Biology Unit, MGIMS, Sevagram, with complaints of infertility (both primary and secondary infertility cases). Detailed history of present and past illness as well as medical and surgical management were taken. Selected male partners underwent thorough surgical examination of genito-urinary system to rule out the exclusion criteria. Only subjects with normally developed genito- urinary organs were included in the study. All the tests were done with due permission from the ethics committee of the Institute and with written consent from the subjects. Specimens of semen were collected by masturbation after 3 days of sexual abstinence. After complete liquefaction, samples were analyzed by SQA II B sperm quality analyzer (M.E.S. Ltd., Israel) for sperm concentration, motility, morphology and according to WHO guideline grouped into following two groups:

1. Group I – showing normozoospermia,): sperm count >20 million/ mL, motility >50 %, normal morphology in >30 % sperms, labelled as 'Normal'.
2. Group II – showing oligoasthenoterato , asthenoteratozoospermia or azoospermia: sperm count <20 million/mL, motility <50 %, normal morphology in <30 % sperms, labelled as 'Abnormal'.

Except for the normozoospermics, all other subjects with abnormal seminogram profile were asked to come for repeat semen analysis after 1 month. If the second report was also abnormal then only they were included in the abnormal groups and the semen samples were utilized for further physio-chemical assessment. Subjects with varicocele, hydrocele, undescended testes or any other structural abnormality or any history of surgical intervention in the genitourinary tract which may interfere with male fertility were excluded from the study. Subjects with any acute febrile (>38 ^{0} C) illness or a history of similar episode in last six month or treatment history with drugs like cancer chemotherapy, nitrofurantoin, niridazole, colchicine or any hormonal preparation which may directly suppress the spermatogenesis were also excluded from the study.

Viability of sperms was assessed by Eosin–Nigrosin staining as per the method of Eliasson et al.

After evaluation of physical parameters, whole semen sample was centrifuged at 3000 r.p.m. for 10 minutes .Then, without disturbing the pellet at the bottom, supernatant seminal plasma was taken for following chemical assays:

1. **Estimation of MDA** (Thiobarbituric Acid method described by Yao-Yuan Hsieh et al, 2006**).**
2. **Estimation of uric acid** (Trivedi et al, 1976)

3. **Estimation of Ascorbic acid** (McCormick and Greene, 1994 **)**
4. **Estimation of Reduced Glutathione (GSH):** (Beutler et al, 1963)

Results: The average percentage of viable sperms in normal group was found to be

68.33 ± 5.46% and in abnormal group 59.34 ± 9.69 %.Viability decreased significantly from normal to abnormal group, P< 0.01. The lipid peroxidation as expressed by MDA level in seminal plasma was found to be significantly increased in abnormal group than in normal. All the non- enzymatic antioxidants were found to have higher levels in normal ejaculates.

A negative co-relation was found between viability of sperm (%) and MDA level of seminal plasma (nmol/ml). (r = -0.8, p<0.01).

All the anti-oxidant molecules also showed a negative correlation with level of MDA.

Conclusion:

- Present study concluded that high rate of lipid peroxidation may have some association with poor semen quality.
- Antioxidants like ascorbic acid, reduced glutathione and uric acid seem to have defensive role against the oxidative damage to the sperms.
- Sperm viability can be used as an authentic indicator of seminal quality and it can be severely affected by lipid peroxidation.

SRP/04

Role of nutraceuticals in treatment of azoospermia due to maturation arrest

[1*]**Amit Kant Singh**, [2]Shripad B. Deshpande
[1]Professor, Dept. of Physiology, UPUMS & R, Saifai, Etawah, India- 206130
[2]Professor & Head, Dept. of Physiology, IMS, BHU, Varanasi, India- 221005

Background: Less than 1% of general population and 10 to 15% of infertile men suffer from azoospermia. Azoospermia is a condition associated with absence of spermatozoa in the semen and can result from the absence of spermatogonial cells (germinal cell aplasia), arrest of spermatogonial cell division either at meiosis or mitosis (maturation arrest) or obstruction to the ductal system which transports the spermatozoa (obstructive). The azoospermia due to maturation arrest can result from number of conditions such as exposure to toxic chemicals, varicocele, testicular torsion, hormonal deficiency etc. The environmental toxicants are reported to cause oxidative stress in the testis with decreased spermatogenesis. In patients with varicocele a decreased anti-oxidant capacity of the semen was observed and varicocelectomy improved the fertility status of these patients. In case of testicular torsion anti-oxidants provided beneficial effect. Hormonal deficiency was postulated to contribute or result from testicular oxidative stress. Thus oxidative stress is a common factor in all the conditions of azoospermia due to maturation arrest. **Hypothesis:** Since oxidative stress is implicated in azoospermia due to maturation arrest, it is hypothesized that anti-oxidants will be beneficial in the treatment of this condition. Vitamin A, vitamin C and vitamin E are natural antioxidants present in our diet. Further, minerals such as Zn, Cu, Fe, Mg, Mn etc are co-factor for mitochondrial enzymes.

Aims & Objectives: This study was undertaken to evaluate the efficacy of multivitamin and micronutrient supplementation in azoospermic patients with maturation arrest.

Materials & Methods: A total of 35 azoospermic patients showing maturation arrest on testicular biopsy were recruited in this study. The patients were divided into two groups. Untreated group (n=11) without any treatment and treated group (n=24) who received multivitamins, micronutrients and co-enzyme Q10. The sperm concentration, motility and morphology were evaluated at monthly interval.

Results: The results showed reduction in liquefaction time and relative viscosity of the semen in the treated group. Further, in treated group there was appearance of spermatozoa (4.0 million/ml) exhibiting progressive motility (7%) and normal morphology (6%), even in the first follow up visit. The sperm count, motility and normal morphology increased significantly on subsequent visits. Within 3 months (3 visits) 2 pregnancies were reported.

Conclusions: These observations indicate that multivitamin and micronutrient supplementation improve the qualitative and quantitative parameters of seminogram in patients with azoospermia of maturation arrest.

Symposium 2: "Sleep in Health and Diseases: Emerging Trends".

1. **"Current status of sleep medicine education in India"**

   Dr HN Mallick, Professor, Department of Physiology, AIIMS, New Delhi 110029
   Email: drhmallick@yahoo.com

2. **"Sleep abnormalities in Mental diseases : Special reference to anxiety and schizophrenia"**

   Dr Bindu M Kutty, Department of Neurophysiology,NIMHANS, Bangaluru 560029
   Email: bindu.nimhans@gmail.com

3. **"Sleep during pregnancy-postpartum in women and its development in children"**

   Dr Kamalesh K Gulia
   Scientist & In-charge Division of Sleep Research, Biomedical Technology wing, SCTIMST, Trivandrum 695012
   Email: kkguliak@hotmail.com

4. **"Sleep disorders in India- a meta analysis"**

   Dr Nasreen Akhtar
   Assistant Professor, Department of Physiology, AIIMS, New Delhi 11029
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SSH/01

Current Status Sleep Medicine Education in India

H N Mallick, Dept of Physiology, All India Institute of Medical Sciences, New Delhi, 110049

The ancient Indian literature and sculpture not only describe sleep physiology but also emphasizes the importance of sleep in life. The First International Congress on Sleep-Wakefulness held during September 9-11, 1992 marked the beginning of modern sleep medicine in India. Since then sleep medicine is rapidly progressing in our country. During last ten years there has been remarkable growth because of recognition obstructive sleep apnea as a source of many ailments and its adoption by pulmonologists. In spite of rapid industrialization and the emergence of a modern 24/7 h society, knowledge about sleep and its disorders is lacking amongst the general public and doctors. A need is felt to raise the level of awareness of sleep to that of the level of nutrition and exercise. There is shortage of trained certified sleep specialist and technicians to meet the emerging demand. A need is felt to provide standardized sleep health care service. The role of professional sleep societies, industry, private enterprises and government agencies to promoting sleep medicine education in the country is emphasized. Vertical integration of education in sleep physiology and disorders, from school level to graduate and postgraduate medical education is advocated. To create specialists in the discipline, horizontal integration with physiology, neurology, psychiatry and pulmonary medicine is a visible solution in this multidisciplinary subject. The government should recognize sleep as an important public health issue.

SSH/02

Sleep abnormalities in mental diseases: special reference to anxiety and schizophrenia

Bindu M. Kutty, Department of Neurophysiology, NIMHANS, Bangalore.

Sleep abnormalities have been implicated in mental diseases such as depression, ADHD, autism, schizophrenia etc. Sleep is important for various aspects of brain development and maturation. It is thought that a defect in sleep maturational process alter the mental and psychological development and various mental dysfunctions associated with hyper activity, enhanced anxiety, reduced attention and learning difficulties , altered emotionality and reduced masculine sexual behaviours have been implicated with sleep abnormalities. We are yet to ascertain the different brain mechanisms associated with sleep abnormalities and the subsequent behavioural alteration associated with the mental disorders.

We have undertaken studies to evaluate the micro sleep architecture abnormalities in terms of defective spindle delta dynamics associated with generalised anxiety disorders (GAD) with co morbid social phobia and in schizophrenia. Our studies provide more insight into the defective sleep stabilising mechanisms that results in fragmented sleep in these disorders. In addition, the Ayurveda intervention studies highlight the efficacy of manasamitra vataka in preserving the sleep quality and preventing anxiety in GAD patients with co-morbid social phobia. The studies provide more insight into the dysfunctional thalamo cortical mechanism responsible for sleep instability in schizophrenia and anxiety.

SSH/03

Sleep during pregnancy-postpartum in women and its development in children

Kamalesh K Gulia, PhD
Scientist & Incharge, Division of Sleep Research
Biomedical Technology wing, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum

We spend one third of our life in sleep. Current data suggests high prevalence of sleep disorders in the current era of 24X7. There are growing concerns for sleep deprivation in society as it is affecting not only general health but is also a risk factor for diabetes, high blood pressure, heart diseases, stroke, cancer, obesity and metabolic syndromes. Sleep is also compromised in various disease conditions. Anxiety of having sleep disorders further adds to the sleeplessness. Sleep requirement differs across different age groups and thus sleep disruption affects brain differently during development. Sleep deprivation during pregnancy-postpartum and in growing children require attention.

Sleep disruptions during pregnancy and post-partum lactation period is an emerging health concern. We have reported increased anxiety disorders and cognitive deficits in the offspring born to sleep compromised mothers. To assess the effects of sleep disruptions during pregnancy, study was conducted in animal model (female Wistar rats) taking two groups of animals, one normal time control and other sleep deprived. Sleep was assessed during pregnancy, post-partum and after weaning, in both set of animals. Sleep-wakefulness (S-W) was measured objectively taking electroencephalogram (EEG) and electromyogram (EMG), which is gold standard for sleep evaluation. These electrodes were surgically implanted in nulliparous female Wistar rats maintained in standard laboratory conditions with food and water given *ad libitum* under anaesthesia. After post-surgical recovery, three control recordings of S-W were taken for 24 h before the animals were kept for mating. After confirmation of pregnancy, S-W recordings were acquired during different days of pregnancy, post-partum lactation/nursing days, and also after weaning. In one group, animals were sleep deprived during third term of pregnancy (5h/ day from gestational day 15 to 20 through gentle handling). The sleep in their pups was also recorded on different postnatal days (pnds 1, 5, 10, 15 and 20). The results indicated an increase in sleep during pregnancy, primarily due to an increase in

light non-REM sleep (S1) during dark period. After parturition, there was a decrease in sleep, especially during daytime, with an increased number of short duration S1 episodes. It resulted in increased time in waking with fragmentation of sleep. In neonates, emergence of sleep pattern from primitive active and quiet sleep to more organized sleep patterns of NREM and REM sleep will be discussed. The physiological changes in sleep during pregnancy and post-partum period will be the correlated with the changing sleep patterns of the neonates.

SSH/04

Sleep disorders in India-A systematic analysis

Dr Nasreen Akhtar,
Assistant Professor, Department of Physiology, All India Institute of Medical Sciences, New Delhi

Sleep is a phenomenon quintessential for maintenance of homeostasis and good health. Sleep deficiency can also result in myriad adverse behavioural consequences, including profound sleepiness, cognitive slowing, automatic behaviour, attentional failures and performance degradation, errors, and accidents. Prevalence of sleep disorders in the society has an implication for National health and warrants National Policy decisions regarding sleep disorders and their prevention. For appropriate National Policy on Sleep, an accurate account of the burden of sleep disorders in Indian population is warranted. To achieve this goal, a systematic review of the available literature on the prevalence of sleep disorders in adult Indian Population will be undertaken and the data will be presented.

For conducting this review, we will follow the illustrated step by step guide for systematic reviews and meta-analysis by Pai et al[1] and consult the Cochrane handbook[2]. For reporting, we will consider the guidelines for meta-analysis of observational studies in epidemiology (MOOSE)[3]. A highly sensitive search strategy allowing literature search will be utilized. For literature search, electronic search in MEDLINE, EMBASE , Cochrane Library and manual searches from January 2000 till September 2016 will be used using the terms 'Sleep', 'India', 'disorders' and 'prevalence'. Only English language results will be included. Well defined inclusion and exclusion criteria for the studies will be utilized. Only original articles from observational studies (prospective and retrospective cohort studies, case control studies and cross sectional studies will be used. Case reports, case series and case only studies or analysis of single events will not be used). We aim to provide a comprehensive and systematic review of literature on prevalence of sleep disorders in adult population of India.

Symposium 3: Sympathovagal dyshomeostasis in pregnancy-induced hypertension and role of yoga in its prevention

Speakers

1. **Pregnancy-induced hypertension: Current scenario**

   Dr. S. Velkumary, Associate Professor of Physiology, JIPMER Pondicherry.

2. **Pathophysiology of pregnancy induced hypertension (PIH)**

   Dr. N. Prabhu, Assistant Professor of Physiology, JIPMER Pondicherry.

3. **Role of Sympathovagal imbalance in the genesis of PIH**

   Dr. Pravati Pal, Professor of Physiology, JIPMER Pondicherry.

4. **Role of yoga in the Prevention of PIH (20 min)**

   Prof. G. K. Pal, Professor of Physiology, and Registrar (Academic), JIPMER Pondicherry.

SPIH/01

Pregnancy-induced hypertension: Current scenario

Dr. S. Velkumary,
Associate Professor of Physiology, JIPMER

Hypertension is the most common medical problem encountered during pregnancy, Worldwide it is estimated that pregnancy induced hypertension (PIH), one of the hypertensive disorders of pregnancy (HDP) that affects about 5 – 8 % of pregnant women. In India the prevalence of hypertension during pregnancy was found to be 6.9 % (Mehta B et al 2015).It is associated with adverse pregnancy outcomes as well as maternal morbidity and mortality. Hypertension in pregnancy is defined as a systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg on at least 2 occasions of 4 to 6 hours apart. National High Blood Pressure Education Program classifies HDP into 5 categories: gestational hypertension or PIH, Preeclampsia, eclampsia, Chronic hypertension, Preeclampsia superimposed on chronic hypertension. The Gestational hypertension is defined as hypertension that develops for the first time in pregnancy after 20 weeks of gestation without proteinuria. The underlying basic pathology for the genesis of hypertension in pregnancy is due to endothelial dysfunction and vasospasm. Recent studies elucidate that the primary contributor of PIH is sympathovagal dyshomeostasis. According to Cande et al, the occurrence of PIH in one pregnancy is a strong predictor of recurrence in the next pregnancy. The risk of developing PIH also tend to increase with increasing maternal age >30 years, nulliparous, family history of hypertension, non-pregnant body mass index>25, this emphasize the need for early booking in pregnancy for early identification and holistic management of problems.

SPIH/02

Pathophysiology of pregnancy induced hypertension (PIH)

Dr. N. Prabhu,
Assistant professor of Physiology, JIPMER

During pregnancy, the placenta undergoes dramatic vascularization to enable circulation between fetus and mother. Placental vascularization involves angiogenesis and maternal spiral artery remodeling. These processes require a delicate balance of proangiogenic and antiangiogenic factors. The imbalances of proangiogenic and antiangiogenic factors trigger abnormal placental vascularization and disease onset. Increased expression of **soluble fms-like tyrosine kinase (sFlt1)**, together with decreased placental growth factor (PGF) and vascular endothelial growth factor (VEGF) signaling are seen. Circulating levels of sFlt1 and PGF are altered several weeks before the onset of clinical disease and are correlated with severity of the disease. It is currently thought that **"poor placentation hypothesis",** in which extravillous trophoblasts fail to invade sufficiently the placental bed, explains in part maternal predisposition to this disease. This hypoxic micromilieu of fetoplacental site secreted proinflammatory substances into maternal circulation synergistically contribute to the progression of PIH. The tissue affected most is the maternal endothelium. Endothelial dysfunction causes altered synthesis and release of endothelial cell products which leads to inappropriate vasoconstriction and its propensity toward a hypercoagulable state. A recent study reported an association of **low first trimester relaxin** concentrations with increased risk of developing preeclampsia. There is an increase in almost all the components of renin-angiotensin system during an uncomplicated pregnancy, but renin activity, angiotensin II, and aldosterone decrease in preeclampsia. There are studies report the presence of **angiotensin II type 1 receptor agonistic antibody (AT1-AA)** found circulating in pre-eclamptic women.

SPIH/03

The role of sympathovagal imbalance in the genesis of PIH

Dr. Pravati Pal,
Professor of Physiology, JIPMER, Pondicherry.

Gestational hypertension is reported to be one of the most common disorders seen in human pregnancies. Pregnancy–induced hypertension (PIH)

is defined as hypertension (BP 140/90mmHg on two occasions 4-6 hrs apart or single reading of diastolic BP of >110mmHg) developing after 20 weeks of pregnancy up to 6 weeks postpartum in previously normotensive women (ISSHP). The presentation of PIH can be asymptomatic hypertension and proteinuria at one end of the spectrum to multi-organ failure at the other end. Though far-reaching researches have taken place in the field of PIH, the exact pathophysiological mechanism is still not clear.

Sympathetic over activation plays a pathogenic role in triggering the essential hypertension. The characteristic vasospasm in PIH is due to sympathetic over activity, and imbalance between vasodilators & vasoconstrictors. Some studies demonstrated higher resting plasma catecholamines levels and increased sympathetic activity in PIH. In microneurography, an increase in single unit and multiunit discharge of muscle sympathetic nerve activity has been shown to occur during the third trimester in patients with PIH relative to women with normal pregnancy.

The autonomic nervous system has sympathetic and parasympathetic components and imbalance in any or both of the components is known as sympathovagal imbalance (SVI). Heart rate variability, the study of beat-to-beat fluctuations in heart rate, cardiac autonomic reactivity tests and baroreceptor reflex sensitivity are established tools to measure SVI. The sympathetic activity, which slowly increases in third trimester in normal normotensive pregnancy, is exaggerated in PIH even in first trimester. Though the SVI in PIH is contributed by both sympathetic over activity and vagal withdrawal, especially in early-onset type, SVI is mainly due to vagal inhibition.

SPIH/04

Role of yoga in the Prevention of PIH

Prof. G. K. Pal,
Professor of Physiology, and Registrar (Academic), JIPMER.

Though many etiologic factors and mechanisms have been proposed for the genesis of pregnancy-induced hypertension (PIH), the primary physiological basis of PIH is the sympathetic over activity, caused by release of putative vasoconstrictors from defective placenta. Therefore, delivery of placenta results in normalization of blood pressure (BP) in PIH. However, recently we have reported the role of vagal withdrawal in addition to sympathetic over activity in the pathophysiology of PIH, the mechanism widely called as sympathovagal imbalance (SVI). Recently, dyslipidemia, atherogenic lipid profile, insulin resistance, prediabetes, diabetes, retrograde inflammation, psychosocial stress and work stress have been reported to induce sympathovagal imbalance and cause PIH. Further, vascular hypertrophy initiated and aggravated by SVI plays a crucial role in the genesis of PIH, especially in Indian population. SVI has been reported to be associated with diabetes, hypertension, heart disease and other metabolic disorders. SVI has been documented to promote degeneration and decay and is the basis of all cause morbidity and mortality. Hear rate and heart rate variability (HRV) are measures of sympathovagal balance or imbalance. Resting tachycardia and decreased HRV are established CV risks. Lifestyle modifications especially regular exercise and yoga therapy as intervention modules have been reported to be effective in prevention of cardiovascular disease (CVD) including PIH. Yoga appears to be most effective among them as yoga ensures sympathovagal balance. The basis of yoga in prevention of CVD is derived from the fact that yoga attains holistic improvement of health through body (physical-physiological) – mind (psychological) homeostasis by primarily attaining sympathovagal balance. 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. Sympathovagal balance is the cornerstone of a stable homeostasis. Practice of yoga, especially relaxation techniques and slow pranayamas has been known to ensure sympathovagal balance, improve HRV, decrease BP and reduce CV risks. Therefore, practice of yoga, especially slow

pranayamic breathing that aims at improving vagal tone and reducing sympathetic activity appears to be promising in the treatment and prevention of PIH.

Symposium 4: Cognition and Neuroplasticity

1. **Concept of Neuroplasticity, neurogenesis and synaptic plasticity:**

   Dr. G. S. Gaur, Professor and Head, Department of Physiology, JIPMER, Puducherry

2. **Stress and Neuroplasticity; Role of physical activity.**

   Dr. B. M. Naik, Assistant Professor, Department of Physiology, JIPMER, Puducherry

3. **Harnessing Neuroplasticity for clinical application**

   Dr. Vivek Kumar Sharma, Additional Professor of Physiology, JIPMER, Pondicherry

4. **Cognition and neuroplasticity: Importance of Animal Models.**

   Dr. Bindu Kutty, Professor, Dept. of Neurophysiology, NIMHANS, Bangalore

5. **Future Technologies in Neuroplsticity**

   Dr Madhavan C, Senior Resident, Department of Physiology, JIPMER, Puducherry

SCN/01

Concepts of synaptic plasticity, Neuroplasticity and Neurogenesis

Dr. G. S. Gaur,
Professor and Head, Department of Physiology, JIPMER, Puducherry

The neuronal circuits in adult brain, once believed to be hard and fast wired which loses the ability to regenerate or accommodate changes. But recent research has shown that brain can recognize itself the deficit and evolve by readjusting its circuits when reacting to varied stimuli. This ability of the brain is referred as neuroplasticity, which enables us to react, adapt, repair and evolve.

Synaptic plasticity is defined as the ability of a synapse to strengthen or weaken over time. Alteration in the Ca^{++} release at the pre and post synaptic levels modifies synaptic transmission resulting to various processes like sensitisation (increased responsiveness to innocuous stimuli that follow the presentation of a strong or noxious stimulus), habituation (learning not to respond to repetitions of an insignificant stimulus) and associative conditioning (learning to respond to a previously insignificant event after it has been paired with a significant one) bringing about behavioral changes over the time. Sustained alterations at synaptic level can lead to long term potentiation or depression which forms the basis for learning and memory. This adaptability of the brain conferred by the plasticity also enables the subject to recover after a brain injury.

Neuroplasticity plays a significant functional and ameliorative role across a wide spectrum of brain diseases as well as in normal ageing and health. From the changes caused at neuronal level to cortical remapping involving several neurons, plasticity forms a major tool in neuro rehabilitation. The neuro rehabilitation process for stoke patients involves inducing neuroplasticity by non-invasive brain wave stimulation, physical training, cognitive training. It is also used in management of phantom limb pain.

SCN/02

Stress and Neuroplasticity; Role of physical activity

Dr. B. M Naik,
Assistant Professor, JIPMER

Neuroplasticity is the brain's ability to form new neural connections throughout life under the influence of various stimuli; extrinsic or intrinsic. These stimuli can be in form of sensory stimulation, new information either a structural damage or functional alteration of brain. Among the various factors affecting the learning ability of brain, stress has been shown to have significant effect by reducing the neuroplasticity. It has been observed that under stress the neurons of hippocampus and other parts of brain show many structural changes in terms of dendritic shortening and retraction, reduction of the number of synapses thereby affecting the neuroplasticity of the brain. Neuroplasticity plays a vital role in large spectrum of brain diseases like degenerative conditions both pathological and physiological like normal aging. There are several attempts made to facilitate neuroplasticity as a therapeutic module for stroke with paresis / paralysis where physical activity is found to be largely contributing for it. In recent years the beneficial effects of physical activity on improving executive functions, episodic memory, perceptual speed, and spatial reasoning are well documented. Physical activity stimulates the release of many neurogenic factors stimulating neurogenesis and neuroplasticity. Physical activity as a daily routine also helps in maintenance of cardiovascular fitness which is necessary for long-term effects on cognition. Besides the daily physical activity, specific brain neuroplasticity exercises are also being tried which is showing a remarkable result in rehabilitation of patients of paresis / paralysis and learning disability.

SCN/03

Harnessing Neuroplasticity in Clinical Application

Dr. Vivek Kumar Sharma,
Additional Professor of Physiology, JIPMER, Pondicherry

For centuries conventional wisdom in neuroscience has been that our brains are totally hardwired and brain structure and functions get fixed in early childhood. It had depressing ramifications in the management of medical disorders that include Neurodegenerative disorders like Alzheimer's disease and recovery from stroke, trauma etc. Also, non-regeneration of nervous tissue had put mental blocks for healthy adults by restricting the ability for specialization in various fields of skills and above all, this limits the possibilities of human transformation. Recent research with advent of fMRI, PET scan, CT scan etc. in the last decade shows that we not only have the ability to change the structure of our brains, but that we continually grow new brain cells right on through old age. Neuroplasticity is the lifelong ability of the brain to reorganize neural pathways based on new experiences. If brain is challenged, it tries to come up to it in both health & diseases. Various new applications of principles of neuroplasticity have been developed which include "Constraint Induced Movement therapy" that employs counter-intuitive principle of 'Restraining, Rewiring, Relearning' leading to strengthening of paretic limbs and blocking of normal limbs for most of the time. This has shown improvement even in the rehabilitation of many decades old neurodegenerative changes. Another important application is in the treatment of disorders by applying principles of sensory substitution. Recent studies have shown that proper training can lead to improvement of IQ even in autists and healthy population. Multiple bio-feedback techniques are based on neuroplasticity principles that are being used to improve quality of life and treatment of psychiatric disorders. This field is witnessing exponential growth and will benefit mankind by helping it realize its potentials.

SCN/04

Cognition and neuroplasticity: Importance of Animal Models".

Dr. Bindu M. Kutty ,
Professor,Dept. of Neurophysiology, NIMHANS, Bangalore

Twenty-first century neuroscience provide us much clarity on various aspects of brain and behavior and brain, mind, self and consciousness processes. Thanks to the advancement in conceptualization

and methodological tools that helped us to expel our ignorance on brain and its relation with behavior. Animal models have played significant role in providing many aspects of brain functions including cognition. A major paradigm shift occurred when animal studies provided the valuable information on the existence of adult brain plasticity and the concept of dynamic brain!!

Animal models have been used since the time of Pavlov, Edward Thorndike and Skinner to unravel various aspects of brain and behavior, brain and mind relations. Behavioral studies using various maze procedures have provided us valuable insights upon neural mechanisms of cognitive functions including learning, memory, attention, concentration, etc. The studies also helped us to elucidate many aspects of the phenomenon on adult brain plasticity and cognitive reserve capacity of the brain and their importance in mediating and modulating behaviors. All these studies have provided us much impetus on how training help shaping behaviors, and the associated changes at molecular and network levels to highlight the brain mechanisms of cognition, learning and memory functions. Such understanding are important to elucidate the neural basis of neuropsychiatric disorders , neurodegenerative disorders including Alzheimer's disease , epilepsy schizophrenia , obesity related biochemical and behavioral alterations etc . I will be summarizing the many studies we have been carrying out in our department to elucidate the mechanisms of cognition, learning and memory using various animal models.

SCN/05

Future Technologies in Neuroplsticity Research

Dr Madhavan C,
Senior Resident, Department of Physiology, JIPMER, Puducherry

Studies in the field of Neuroplasticity have provided the scientific experimentations for realization of interfacing of human with hi tech machines, expanding our horizons to unimaginable heights in both health and diseases. Examples like seeing through sound or touch, or operating a computer by just mere thinking are experimental models at prototype levels.

The objectives of the research in neuroplasticity is centred around neuro-rehabilitation to aid in recovery of patients with stroke and those with deficits in sensory modalities. The idea to substitute a sensory modality with another - *sensory substitution*, was introduced Paul Bach-y-Rita who devised the idea of stimulating visual cortex with tactile input. Several patented technologies are now available like the vOICe, Eye Music, etc which help to process audio input to convert it into visual signals. Using such devices require training and rewiring the brain's circuitry by feedback systems.

The *Brain computer interface* (BCI) or commonly referred as brain-machine interface is a feedback system where the biofeedback signals from the device induces Hebbian plasticity. On provision of accurate feedback signals at the appropriate neural states have shown rapid recovery in stroke patients. The BCI is different from a neuroprosthetic device as it connects the brain to a computer interface while the latter connects part of nervous system to a device. Sensory substitution and BCI apart from its use in neuro-rehabilitation is also experimented to heighten sensory experience in normal subjects - Sensory Augmentation.

Symposium 5. Ignite research minds among Medical Professionals: Role for Basic Scientists in Medical College

SIMP/01

Young brains on stress: Could it be a cause for hypervigilant adult brain?

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Email: laxmir@gmail.com

Hypervigilance state is a common symptoms of anxiety disorders. Increased arousal, anxiety and sensitization to non-specific stimuli are common features which affect the performance of an individual. In addition, hypervigilance is also known to affect the sleep hygiene. But what causes hypervigilance is not clearly known. In the present study, we examined the effect of early life stress on hypervigilant state of rats by studying the affective and non-affective behaviours.

Here rats were subjected to maternal separation and isolation stress during stress hyporesponsive period. After 2 months, these animals were subjected to various tests to study the cognitive functions such as attention, social interaction, fear and spatial learning and memory. The results indicates that stress has produced increased anxiety-like behaviour, heightened attention, increased fear behaviour and increased spatial learning and memory. These results supports the idea that childhood stress may have long-term consequences on arousal state and thus lead to hypervigilance state during the adult life and increased risk for the post-traumatic stress disorder.

SIMP/02

Melatonin: An ancient molecule with a promising role as a cardioprotective agent

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Melatonin, (N-acetyl-5-methoxytryptamine), a secretory product of the pineal gland, is an evolutionarily conserved ancient molecule that has long been known for its remarkably diverse functions as a circadian rhythm regulator, an anti-inflammatory and immunoregulating molecule and most recently as an oncostatic agent. However, its antioxidant and free radical scavenging ability seems to be the most widely studied property of this ubiquitous indole and it has recently also gained momentum as a cardioprotective agent against oxidative stress mediated myocardial ischaemia. Ishaemic Heart Disease (IHD) and consequential myocardial infarction is a health problem of global concern and its ubiquitous prevalence is increasing worldwide on an annual basis. The involvement of oxidative stress in myocardial ischaemia has long been recognized globally. Reactive oxygen species (ROS), which is responsible for the generation of oxidative stress, play a critical role in the pathogenesis of cardiovascular injury associated with circulatory disturbance. Melatonin is exceedingly effective in reducing oxidative stress under a remarkably large number of circumstances. It is able to accomplish this action via a variety of means such as: direct detoxification of reactive oxygen and reactive nitrogen species and indirectly by stimulating antioxidant enzymes while suppressing the activity of pro-oxidant enzymes. In addition to these well-documented actions, melatonin also reportedly chelates transition metals, which are involved in the Fenton/Haber-Weiss reactions; in doing so, melatonin reduces the formation of the devastatingly toxic hydroxyl radical resulting in the reduction of oxidative stress and effectively providing protection against myocardial ischemia.

SIMP/03

Drug Discovery Process: Serendipity vs. Systematic Approach

Dr. Sanjeev R. Acharya,
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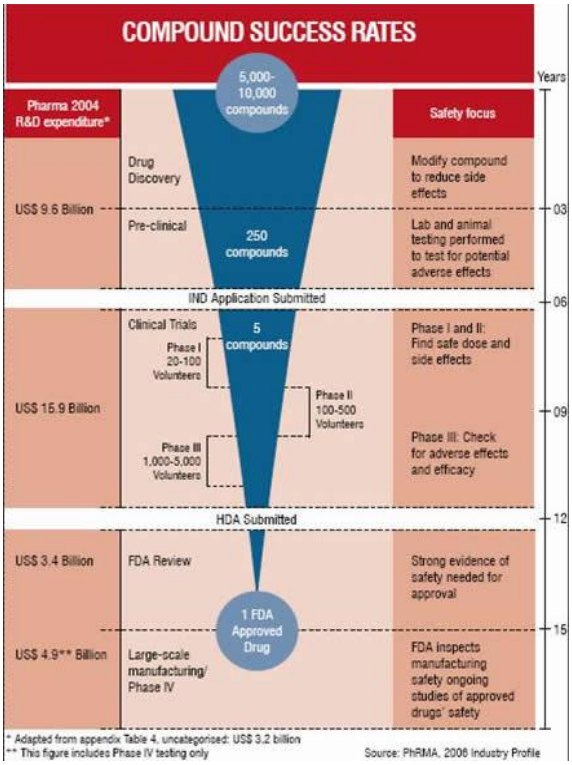
Any New Chemical Entity coverts to drug with five level research activities, which are as i.e drug discovery and development, preclinical research, clinical research, FDA review and Post marketing screening by FDA. Amongst these all phases first two phases are major research activities by basic science and pharmaceutical science community,

however next three phase are mainly research activity of registered medical professionals.



Presently first two phase of research is generally highly unorganized and mostly done initially at university or institute level and from this stage mostly pharmaceutical companies take up the molecules for next stage research. The total time for any molecule to become official drug is approximately 15 years and total development cost at present is nearly $2.6 billion. This itself considered as most burdensome for humanity.

In drug discovery process majorly two approaches are very common. One which was older approach and based on observation of scientist commonly known as serendipity approach and secondly, the approach which presently most pharmaceutical industries are following that is high throughput systematic discovery. In whole sum out of total molecules converted into active pharmaceutical agents 15% are derived by providence.

In nutshell, at present research and development of drug is long, highly knowledge and complexly driven which compelled medical professionals to be knowledge centric in coming years.

Symposium 6. Stem Cell

SSC/01

Regulating the master regulator of skeletal myogenesis

Kulwant Singh[1], Marco Cassano[2], Evarist Planet[2], Soji Sebastian[1], Suk Min Jang[2], Gurjeev Sohi[1], Hervé Faralli[1], Jinmi Choi[3], Hong-Duk Youn[3], Trono Didier[2] and F. Jeffrey Dilworth[1]

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In skeletal muscle, “Satellite cell” functions as resident muscle stem cell and responsible for postnatal maintenance. In healthy adult muscle, satellite cells are located underneath the basal lamina in a mitotically quiescent state. In response to muscle injury, satellite cells become activated and give rise a population of cells called as “myoblast”. Myoblasts are mitotically active and undergoes multiple round of cell division. Under the conditions suitable for differentiation, myoblast exit the cell cycle, differentiate and fuse to the damaged muscle fibres which results in accomplishment of muscle repair process. The transcription factor MyoD acts as a master regulator of muscle differentiation as it regulates both proliferation and differentiation of myoblasts. Interestingly, genome-wide analysis revealed that MyoD is already associated with many of its transcriptional targets in proliferating myoblasts. However, it is unknown what prevents MyoD from activating these genes prior to induction of terminal differentiation. Here,

we identify KAP1/TRIM28 as a key regulator of MyoD function. In myoblasts, KAP1 is present with MyoD at many muscle genes where the protein acts as a scaffold to recruit not only co-activators such as p300 and LSD1, but also co-repressors such as G9a and HDAC1, with promoter silencing as net outcome. Upon differentiation, MSK1-directed phosphorylation of Kap1 leads to the displacement of co-repressors from the scaffolding, allowing the tethered co-activators to establish robust expression of muscle genes. Thus, we identify Kap1 as a novel interpreter of cellular cues that regulates MyoD function in differentiating muscle.

SSC/02

Genetics of Stem cell- Clinical Consequences in Humans

Ajit K Saxena , Meenakshi Tiwari, Girish K. Singh.
All India Institute of Medical Sciences Patna

Stem cells are found in many tissue of the body. Stem cells have three distinct characteristics: self-renewal, ability to proliferate extensively and ability to transform in to multiple cell lineages i.e. ectoderm, mesoderm and endoderm. During embryogenesis, large numbers of extrinsic & intrinsic factors are responsible to maintain the normal physiology of stem cells and later these factors have been characterized as Oct 4, Nanog 3 & Sox 2. Interestingly, if mutation occurs in these genes, self-renewal defects arises in combination with ability to transform in to multiple cell lineages which seems to develop large number of anomalies such anorectal malformations, congenital anomalies of central nervous system (i.e. neural tube defects), infertility, chronic wounds and cancer. Epidemiological studies reveal that genetic and epigenetic factors (nutritional status) are responsible for the function of stem cell. The etiopathology of such diseases are highly complex. The curiosity has been developed to characterize / identify stem cell markers (Oct 4, Nanog 3 & Sox 2) in preclinical diagnosed patients and their correlation has been made with MTHFR gene (epigenetic factor) polymorphism to determine the risk factor. These factors have been characterized by specific forward/reverse primers of stem cell using RT- PCR analysis along with MTHFR as epigenetic marker. The study further extends to evaluate mutational analysis by Sanger's method for nucleotide sequencing to identify novel mutations. Interestingly, the findings are characterized in two ways: 1) the regulation of (up & down) of Oct 4, Nanog 3 & Sox 2; and 2) complete disappearance (null) of these bands. The most interesting findings are significant down-regulation and complete absence (null mutation) of Oct 4 band (577 bp) in cancers of Pancreas and in case of Anorectal Malformations as compared with respective controls. Furthermore, in case of anencephaly, Oct 4 expression increases 2 folds. DNA sequencing analysis reveled novel frame shift mutation of a base pair at position 183 C →T in an isoforms of Oct 4. However, other stem cell markers like Sox 2 and Nanog 3 showed differential expression in different clinical cases. Furthermore, the epigenetic marker MTHFR showed significant differences in heterozygous conditions in a variety of clinical conditions such as cancer, infertility and neural tube defects. Taken together these findings suggest a role of mutations of stem cells along with epigenetic factors are responsible for the abnormal differentiation which lead to further anomalous development in human. The study also highlights the role of Oct4 and their isoforms as a major player in maintenance of pluripotency.

SSC/03

Limbal & Stromal stem cells: A new tool in limbal & corneal wound healing

Vivek Singh*[1,2,3], Abhinav Reddy K[1,2,3],Mukesh Dhamala[1,2,3], Fatheme Tavakkoli [1,2,4], Sayan Basu[1,2,3], Virender Sangwan[1,2,3],

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Limbal stem cell deficiency (LSCD) is one of the major causes for corneal disorders. The possible treatment modality for LSCD includes Simple Limbal Epithelial Transplantation (SLET) or the Cultivated Limbal Epithelial Transplantation (CLET) which requires certain amount of healthy donor limbal tissue by surgical intervention and ensuring safety of the donor eye. However, this therapeutic application lacks perception on the amount of donor tissue to be excised, the biology of the pannus formation and role of stem cell in limbal niche restoration[1].

The recent discovery of multi-potent stem cells in the corneal stroma has opened up the possibility of developing a cell-based approach to treating corneal scars as an alternative to keratoplasty. In a murine model of corneal opacity by scarring, human stromal stem cells were effective in regenerating normal corneal extra-cellular matrix and repairing collagen fibril defects. We foresee the ability of a clinician to isolate and expand the limbal stromal cells from the healthy eye of patient's own limbal stem cells and surgically applying to the scar tissue of the wounded eye to regenerate healthy, transparent tissue[2].

Several techniques of limbal cell culture in vitro have been studied using feeder layers, amniotic membranes or the petri dish as substrates with a combination of either dispase treated suspension cultures or intact tissue explant culture system. We at our institution are attempting to understand the efficient growth and biology of the limbus taking in to consideration about the size of tissue to be excised. This would add an insight to the current standard surgical techniques involving limbus as a source of stem cells assisting in corneal epithelium regeneration[3].

The key questions to be addressed for SLET are a) Pannus formation after limbal cell injury and the histopathological changes with time. b) Limbal explants survival, migration, homing to niche and tissue specific gene expression in the host after SLET in vivo. c) Physiological changes of recipient eye post limbal functional restoration. d) Analyze the betterment of SLET procedure over CLET .The basic struggle of using animal models can be minimized by creating an organ culture model that could possibly answer the above question. The biology of limbal stem cells and their clinical applications appear to have an exciting future ahead. Better understanding of the need-based innovations in surgical techniques will also help in further simplifying the management of corneal diseases through a symbiotic exchange between stem cell research and clinical practices.

Symposium 7. Molecular Basis of Immunity and Supportive Supervision

SISS/01

Role of Immune effector cells in obesity

Prof. Sunita Tiwari
Professor & Head Dept. of Physiology King George's Medical University, Lucknow, U.P.

Obesity is a metabolic disease of pandemic proportion. Adipose tissue is an active endocrine organ that controls energy homeostasis. Adipose tissue secretes various inflammatory cytokines, such as IL-6 and TNF-α and dysregulated production of these proinflammatory mediators over the antiinflammatory adipokine (e.g., adiponectin) is thought to be a central mechanism underlying adverse metabolic and cardiovascular consequences. Adipose tissue is important reservoir for immune cells, so that it act as "nonspecialised immune organ". It is a heterogeneous mix of adipocytes, stromal cells, macrophages, T and B cell, NK cell, and endothelium cell. With obesity and progressive adipocyte enlargement, the blood supply to adipocytes may be reduced with consequent hypoxia. Hypoxia has been proposed to be an inciting etiology of necrosis and macrophage infiltration into adipose tissue. These macrophages, along with other cells, contribute to the production

and secretion of humoral mediators, particularly inflammatory cytokines. Adipocytes, immune cells, and vascular cells dynamically interact with one another within obese visceral fat. Macrophages also have different immunological personalities. In obese adipose tissue, the polarity of macrophage subpopulations moves toward M1 classically activated proinflammatory macrophage, and the M2 alternatively activated macrophage fraction, which may suppress inflammatory responses, is reduced. This suggests that alteration of the balance between M1 and M2 macrophages may contribute to the proinflammatory state of obese fat. T cells are also key regulators of adipose inflammation. Among these T cells, the CD8+ fraction increased during the progression of obesity, while the CD4+ and regulatory T cell (Treg) fractions were diminished. CD8+ T cells within obese adipose tissue induce activation and migration of monocytes/macrophages, and in cooperation with the adipose tissue, they also induce macrophage differentiation. In lean healthy individual, a low pulsatile inflammatory response occurs during the feeding and resolves after the nutrients are metabolized. In obesity or in overfeeding, responses become more intense and resolution less efficient. These signals accumulate over time and may reach a level where the professional immune cells are recruited and activated leading to an unresolved inflammatory response within the tissue. In brief, obesity is a state of chronic low-grade inflammation associated with excess adipose tissue which explains the development of the obesity-related pathologies, such as T2 DM and cardiovascular disease. The close interplay between adipocytes and immune cells leads to active adipose inflammation, which has a significant impact on systemic metabolism. Keywords Adipose tissue, inflammatory cytokines, non-specialised immune organ.

Workshops Abstracts

A) Work Shop on Actigraphy

WSA/01

An introduction to Actigraphy

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Actigraphy refers to the dedicated method/technique for monitoring activity in a subject either along transverse or longitudinal time scale. The technique is non-invasive. It employs a small watch-like device that is usually worn on the wrist of the non-dominant hand; therefore, the technique is also known as 'wrist actigraphy.' The device, using motion sensor (piezoelectric accelerometer), monitors activity of the wrist and provides information on rest-activity pattern/cycle of a subject under study. Absence of activity is construed as rest or sleep.

Currently, many actigraphy devices under different brand names are put up for sale by various reputed manufacturers, such as Philips Respironics, CamNtech, ActiGraph and Ambulatory Monitoring Inc etc., to name a few. We extensively use Philips-Respironics products for monitoring rest-activity pattern in apparently healthy human subjects, shift workers, and patients suffering from cancer, diabetes, hypertension and obstructive sleep apnea (OSA). The output obtained after completion of a desirable monitoring session is presented in the form of actograms depicting rest-activity and/or sleep-wake cycle. It has been demonstrated that the rest-activity cycle is a reliable marker of the human circadian clock. Data obtained through actigraphy devices has several applications and it helps in understanding various types of sleep disorders, namely circadian rhythm sleep disorder, advanced sleep phase syndrome (ASPS), delayed sleep phase syndrome (DSPS), irregular sleep-wake rhythm, shift-work sleep disorder and insomnia.

WSA/01

Outputs of Actigraphy

Arti Parganiha, School of Life Sciences, Pt. Ravishankar Shukla University, Raipur – 492010, India**.** email: arti.parganiha@gmail.com

Actigraphy is a simple, non-invasive and piezoelectric accelerometer-based technique to monitor daily rest-activity rhythm. The latter has been considered as the most robust bio-marker for evaluation of the circadian timing system (CTS) in humans. Various actigraphy devices for the assessment of rest-activity rhythm are available. The outputs [data or end points or variables] of the actigraphy are of two types, namely (1) device dependent and (2) device independent. Different devices may also use different algorithm to obtain a particular output; but the actogram that reflects rest-activity pattern is a universal output in almost all devices. Sleep and nap variables may be device specific. For example, Actiwatch 64 provides 28 sleep and two nap variables; whereas, Actiwatch 2 gives eight sleep variables. Actical yields energy expenditure in addition to rest-activity profile. Actiwatch Score also records subjective variables, such as drowsiness, fatigue, attention, mood, etc. based on m-n scale. This device works as an event marker. Several variables, such as MESOR, amplitude, acrophase, dichotomy index, 24-h autocorrelation, rhythm quotient, circadian quotient, and peak activity can be

derived based on original outputs of actigraphy. All these outputs are generally used to assess sleep and circadian rhythm in rest-activity in humans. In my presentation, through live demo, I will explain inter-device variations with reference to outputs of actigraphy.

B) Pulmonary Function Tests: Procedure and Interpretation: Hands On Workshop

WPFT/01

Spirometry : Hands on!!

Dr. Kamlesh Jha
Assistant Professor, Department of Physiology, AIIMS Patna,

Spirometry is a routinely used pulmonary function test (PFT) that measures the amount and speed of air that a person can inhale and exhale. Results from the test can be used to estimate lung function and aid in the diagnosis of certain respiratory disorders. Besides its diagnostic and prognostic importance in multitude of respiratory especially airway diseases, one of the main use of the technique is to distinguish between obstructive and restrictive airway diseases which many a time instrumental in therapeutic decision making.

NHANES recommends a standard protocol for measurements of various pulmonary function test parameters using standard spirometer.

PROTOCOL FOR SPIROMETRY:

The test results of spirometry varies to a great extent subject to the patient's cooperation, performance of the procedure correctly and instructor's ability to coach the patient prior to the test. Therefore it is crucial to emphasize upon the protocol that to be followed strictly while performing the test.

Eligibility and contraindication for Spirometry:

All the children and adult who require spirometric assessment should be able to follow the instructions given while performing the test. The usual recommended age range for performing spirometry is between 6 to 79 years. The subjects who don't have any of the following contraindications, can undergo the procedure.

Conditions where performing Spirometry is contraindicated, are as follows-

- Current painful ear infection
- Eye surgery in the last 3 months
- Chest/abdominal surgery in last 3 months
- SP or household member tuberculosis exposure
- History of aneurysm or collapsed lung
- History of detached retina
- Stroke or heart attack in the last 3 months
- History of coughing up blood in last month

PROCEDURE:

- Pre-requisite:

- Instruct the subject properly and clearly
- Preferably the subject has not taken any heavy meal or liquid in last 3 hours.
- Ask the participant to loosen any tight clothing and to remove dentures if they are not secure.
- All the spirometric procedure should be preferably done in standing posture unless the subject is physically unable to do so.
- Participant should elevate the chin and extend the neck slightly to avoid partial airway obstruction.
- Nose clip should be applied prior to the procedure.

- Procedure: After proper instruction, the procedure to be undertaken.

Criteria for a reproducible spirogram:

After three acceptable manoeuvres, the two highest values for FVC and FEV1 (taken from acceptable forced expiratory manoeuvres) must show minimal variability:

- The two largest FVC values should agree within 150 ml, and
- The two largest FEV1 values should agree within 150 ml.

Criteria for an acceptable spirogram:

- There shouldn't be hesitation start in the part of the participant;
- Coughing should not be during the first second
- Evidence of glottic closure, mouthpiece obstruction by tongue or dentures, or leaks should not be present.
- A visible plateau is present in the volume-time spirogram; and
- The exhaled breath manoeuvre should last at least 6 seconds (preferably).

The procedure need to be repeated if-

- FEV1 /FVC% is less than the Lower Limit of Normal determined for his or her age, sex, weight, height, and race/ethnicity, or
- FEV1 /FVC% is less than 70 percent.

Depending upon the clinical requirement a post bronchodilator test should be done in the same way after inhalation of a metered dose bronchodilator agent.

WPFT/02

INTERPRETATION OF SPIROMETRY

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INTRODUCTION: Spirometry measures the volume of air exhaled at specific time points during a forceful and complete exhalation after a maximal inhalation. It is a reliable method of differentiating between obstructive airways disorders and restrictive diseases. For determining COPD severity it is an important tool. The important variables measured by it are FVC (forced vital capacity), FEV1 (forced expiratory volume in 1 second), ratio of FEV1 & FVC and SVC (slow vital capacity). It carries minimal risk and is performed in short duration.

INDICATIONS: Spirometry is indicated in various scenarios, of them important ones are [*1*];

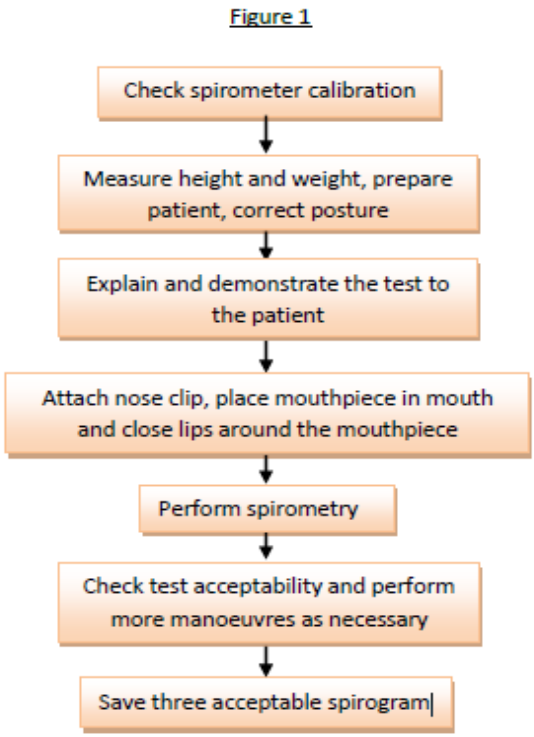
- Evaluation of symptoms such as chronic persistent cough, wheezing, dyspnea, and exertional cough or chest pain.
- Surgical risk assessment.
- Assessment of bronchodilator therapy
- To monitor people exposed to injurious agents.
- To monitor for adverse reactions to drugs with known pulmonary toxicity.

PREPERATION AND PROCEDURE: For reliable measurements the spirometer equipment should have been certified for conforming to the standards laid down by the American Thoracic Society and European Respiratory Society. Spirometry can be undertaken with many different types of equipment, and requires cooperation between the subject and the examiner, and the results obtained will depend on technical as well as personal factors. Patients should withheld inhaled medication prior to spirometry. SABA and LABA should be stopped 4 hours and 15 hours prior to procedure for appropriate assessment.

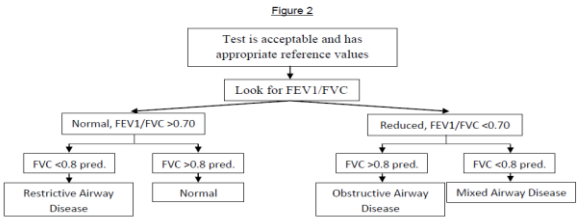
The technician must be well trained in performing spirometry. He/she should have good verbal and visual communication skills and positive attitude towards patients. There are three distinct phases to the FVC manoeuvre, as follows: 1) maximal inspiration; 2) a ''blast'' of exhalation; and 3) continued complete exhalation to the end of test [*1*]. Procedure for carrying out spirometry is shown in figure 1.

Spirogram is acceptable if it is free from artifact (cough, obstructed mouthpiece, leak), has good start and satisfactory exhalation {Duration of 6sec (3sec for children) or a plateau in the volume–time curve} [*1*]. Three acceptable spirogram should be saved.

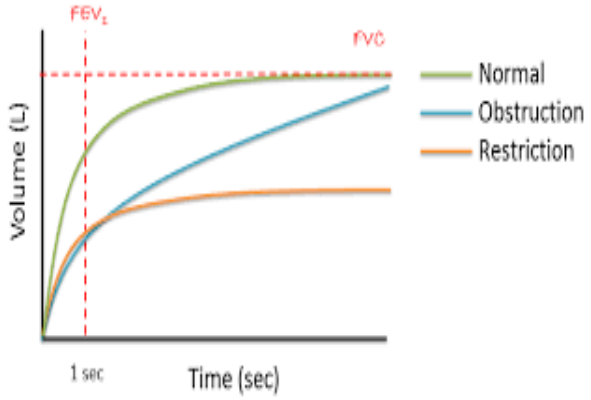
Figure 1



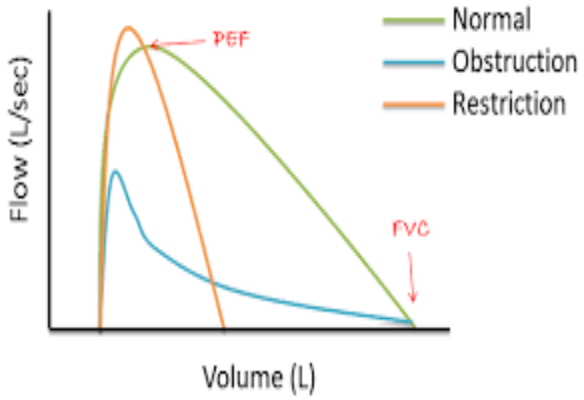
INTERPRETATION: For evaluating spirometry report important parameters are FEV1, FVC and FEV1/FVC. Algorithm for evaluation is depicted in Figure 2.



In Volume- time graph, the volumes and flow rise rapidly. It takes about 2-3 seconds for the volumes to reach a peak and a plateau (flat line) in healthy individuals while patients with airway obstruction may take longer time.



In Flow-volume graph the flows also rise rapidly to reach a peak. The peak flow achieved during forceful exhalation is called as the PEF (peak expiratory flow). PEF represents the condition of the larger airways. The total volume of air exhaled is called as FVC (forced vital capacity). The mid-expiratory flow rates, i.e. the average flow produced in the duration between 25% and 75% of FVC are called as FEF25-75% (forced expiratory flow during 25% to 75% of FVC). The overall shape of the flow-volume curve is helpful for detecting airflow obstruction at an early stage, and yields additional information to the volume-time curve [*2*]. However, interpretation of the flow-volume curve must take into account the values of FEV1 and FVC (as a % of predicted normal).



In the guidelines for COPD, severity is assessed by FEV1/FVC and FEV1 value in spirometry [*3*].

GOLD category	FEV_1
In patients with FEV_1/FVC <0.70	
1. Mild	FEV_1 ≥80% predicted
2. Moderate	50% ≤FEV_1 <80% predicted
3. Severe	30% ≤FEV_1 <50% predicted
4. Very severe	FEV_1 <30% predicted

Indian chest society guideline for COPD also includes post-bronchodilator FEV1 for assessment of severity [*4*].

Severity*	Postbronchodilator FEV_1, % predicted	mMRC grade	Exacerbation frequency†	Complications‡
Mild	≥80	<2	<2	No
Moderate	50-79	≥2	<2	No
Severe	<50	≥2	≥2	Yes

*The category with the worst value should be used for severity classification, †number of exacerbations in the last year, ‡complications include respiratory failure (defined by pO_2 <60 mmHg and/or SpO_2<88% and/or pCO2>50 mmHg), corpulmonale, and secondary polycythemia (hematocrit >55%); FEV_1: Forced expiratory volume in first second, mMRC: Modified medical research council questionnaire, COPD: Chronic obstructive pulmonary disease

CONTRAINDICATIONS: Following are the relative contraindications for performing spirometry [*5*]:

- Haemoptysis of unknown origin (forced expiratory manoeuvre may aggravate the underlying condition);
- Pneumothorax.
- Unstable cardiovascular status (forced expiratory manoeuvre may worsen angina or cause changes in blood pressure) or 'recent' myocardial infarction or pulmonary embolus;
- Thoracic, abdominal or cerebral aneurysms (danger of rupture due to increased thoracic pressure);
- 'Recent' eye surgery (eg, cataract);
- Presence of an acute illness or symptom that might interfere with test performance (eg, nausea, vomiting);
- Recent thoracic or abdominal surgery.

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C) Building trust in Medical Education

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The educational environment makes an impact on student learning and outcomes. And each educational environment has a different personality. The need to build trust between different stakeholders in the educational setting is often undermined. Positive environment and positive outcomes go hand in hand. How does the educational environment influence how, why and what students learn?

Objectives: At the end of this workshop, participants will be able to:

- Define the different components of the educational environment
- Identify factors which influence the educational environment and the influence it has on student learning
- Explore educational climate in different settings in different regions of the world
- Discover ways in which the educational processes can be altered to introduce trust and make it more conducive to student learning and achievement.

Methods: This workshop will use a brief lecturette followed by interactive methods like group work, discussions and activities to reinforce the need for trust in the educational environment.

Agenda: The following topics will be touched upon in this workshop:

- Educational environment and its components
- Use of vignettes to demonstrate influence of educational environment on student learning: How does it influence how, why and what students learn?
- Need to embrace trust into the educational environment
- Sharing of experience of facilitators and participants in building trust in their own work settings
- Ways in which different components of the educational environment can be altered to build trust between stakeholders.

Intended audience:

This workshop is designed for curriculum designers, educational administrators, teaching faculty and students, all of whom are key stakeholders involved in creating the educational environment.

APPI Awards

B K Anand Award

Functional brain microstate predicts the outcome in a visuospatial working memory task

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India Humans have limited capacity of processing just up to 4 integrated items of information in the working memory. Thus, it is inevitable to commit more errors when challenged with high memory loads. However, the neural mechanisms that determine the accuracy of response at high memory loads still remain unclear. High temporal resolution of Electroencephalography (EEG) technique makes it the best tool to resolve the temporal dynamics of brain networks. EEG-defined microstate is the quasi-stable scalp electrical potential topography that represents the momentary functional state of brain. Thus, it has been possible to assess the information processing currently performed by the brain using EEG microstate analysis. We hypothesize that the EEG microstate preceding the trial could determine its outcome in a visuospatial working memory (VSWM) task. Twenty-four healthy participants performed a high memory load VSWM task, while their brain activity was recorded using EEG. Four microstate maps were found to represent the functional brain state prior to the trials in the VSWM task. One pre-trial microstate map was found to determine the accuracy of subsequent behavioural response. The intracranial generators of the pre-trial microstate map that determined the response accuracy were localized to the visuospatial processing areas at bilateral occipital, right temporal and limbic cortices. Our results imply that the behavioural outcome in a VSWM task could be determined by the intensity of activation of memory representations in the visuospatial processing brain regions prior to the trial.

CL Malhotra Award

Chrysin, a PPAR-g agonist improves myocardial injury in diabetic rats through inhibiting AGERAGE mediated oxidative stress and inflammation

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AGE-RAGE interaction mediated oxidative stress and inflammation is the key mechanism involved in the pathogenesis of cardiovascular disease in diabetes. Inhibition of AGE-RAGE axis by several PPAR-g agonists has shown positive results in ameliorating cardio-metabolic disease conditions. Chrysin, a natural flavonoid has shown to possess PPAR-g agonist activity along with antioxidant and anti-inflammatory effect. Therefore, the present study was designed to evaluate the effect of chrysin in isoproterenolinduced myocardial injury in diabetic rats. In male albino Wistar rats, diabetes was induced by single injection of streptozotocin (70 mg/kg, i.p.). After confirmation of the diabetes, rats were treated with vehicle (1.5 mL/kg, p.o.), chrysin (60 mg/kg, p.o.) or PPAR-g antagonist GW9662 (1 mg/kg, i.p.) for 28 days. Simultaneously, on 27th and 28th day myocardial injury was induced by isoproterenol (85 mg/kg, s.c.). Chrysin significantly ameliorated cardiac dysfunction as reflected by improved MAP, ±LVdP/dtmax and LVEDP in diabetic rats. This improvement was

associated with increased PPAR-g expression and reduced RAGE expression in diabetic rats. Chrysin significantly decreased inflammation through inhibiting NF-kBp65/IKK-b expression and TNF-a level. Additionally, chrysin significantly reduced apoptosis as indicated by augmented Bcl-2 expression and decreased Bax and caspase-3 expressions. Furthermore, chrysin inhibited nitro-27 oxidative stress by normalizing the alteration in 8- OHdG, GSH, TBARS, NO and CAT levels and Nox4, MnSOD, eNOS and NT expressions. Coadministration of GW9662 significantly blunted the chrysin mediated cardioprotective effect as there was increase in oxidative stress, inflammation and apoptosis markers. Chrysin significantly ameliorated isoproterenol-induced myocardial injury in diabetic rats via PPAR-g activation and inhibition of AGERAGE mediated oxidative stress and inflammation.

RC Shukla Oration award.

5-HT2B receptor blockade attenuates β-adrenergic receptor-stimulated myocardial remodeling in rats via inhibiting apoptosis: role of MAPKs and HSPs

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Recent studies have proposed the potential role of 5-HT2B receptor (5-HT2BR) blockade in alleviating myocardial dysfunction; hitherto, the regulatory pathway for its protective effect has remained enigmatic. In the present study, we sought to investigate the role of SB- 204741, a 5-HT2BR blocker in isoproterenol-induced myocardial remodeling in rats and its cross-talk with apoptosis and mitogen activated protein kinase (MAPKs)/ heat shock proteins (HSPs) pathway. To assess this hypothesis, we measured the effect of SB-204741 (0.25–1.0 mg/kg/day, i.p.) in isoproterenol (85 mg/kg/day, s.c.)-induced myocardial remodeling in rats. SB-204741 dose dependently improved hemodynamic and ventricular functions following isoproterenol-induced myocardial injury. This amelioration was well substantiated with reduced expression of 5-HT2B, inflammatory proteins (NFjBp65, IKK-b, TNF-a, IL-6, and Cox-2), MAPKs (pp38/ p38 and p-JNK/JNK ratio) accompanied with increased protein expression of HSPs (aB-crystallin, Hsp27 and Hsp70), autophagy (LC3 and Beclin-1) and p-ERK/ERK ratio. Additionally, SB-204741 inhibited apoptotic signaling pathway as there was decreased DAPI/TUNEL positivity and protein expression of cytochrome c, Bax, and caspase-3 along with increased Bcl-2 expression. Preservation of histopathological and ultrastructural components, normalization of nitric oxide level, endogenous antioxidants and myocyte injury marker enzymes were also observed. In conclusion, inhibition of apoptosis via modulation of MAPKs/HSPs is essential for 5-HT2BR blockade mediated cardioprotective effect. Keywords SB-204741 5-HT2B Isoproterenol Myocardial remodeling Apoptosis Autophagy MAPKs, HSPs Intr

ML Gupta Award

Physiology Education-Yesterday, today and tomorrow

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The objective of this presentation is to share my experiences as a student of physiology for nearly four decades, teacher for over three decades and make a sincere effort to foresee the future of physiology education in view of changing scenario of medical education and health care system all over the world. The seniors in the field of medical education recall, the duration of first year course was 18 months. Inspite of delay in admission and student/university driven modification of exam dates, the effective duration of course was atleast 16 months. The student had ample time to settle in a completely unknown environment with

significantly different teaching-learning pattern. During the period of 18 months, students were exposed to extensive content of physiology. They had sufficient time to comprehensively understand the basics of Physiology. However, the clinical orientation of basic sciences was grossly lacking. There was 28 information overload in teaching of physiology. The delivery of content was decided by teacher, imparted through didactic lecture. Thus it was certainly a teacher cantered approach. Merit in the respective category decided the entry into medical colleges. The students were best in their groups. They exhibited greater passion and interest in the studies with sole objective being the best. The passion and dedication to study is conspicuous by its absence in the present day students. Practical exercises included hands on training in hematology, frog experiments and demonstration of dog and rabbit experiments. The hematology experiments had relevance as the qualified primary care physician had to work in a peripheral health center performing these hematological tests as a part of effective management. The techniques came in handy to setup the bedside laboratory and train the technicians in a rural setting. The frog experiments gave the opportunity for the student to handle live tissue, see its reaction to various manipulations in a controlled environment. It also had potential for experimentation to explore the newer concepts. However, it was a dreaded part of the examination as it decided the fate of the students. The demonstration of dog and rabbit experiments, limited opportunity to for students to participate actively in these experiments in select medical institutions created curiosity and provided opportunity to understand complex concepts of physiology of maintenance of homeostasis. Looking back, animal experiments with specific objective and purpose has a great role in physiology education. Formative assessment was not a part of student evaluation. Year end, at best term end assessment decided the fate of the student for promotion to the next class. The questions were open ended, vague with assessment being subjective, at times irrational. Large majority of the times the student had to depend on his luck than the ability to succeed in the examinations. There is a paradigm shift in teaching-learning environment in medical colleges. Teaching-learning activity is supposed to be based on the strong foundation of medical education. Sadly, the duration of course has been reduced to 12 calendar months. The litigations, influence of vested interest have reduced to duration to barely 8-9 effective months. The student from plus two has little time to adjust to changed environment and do justice to study of subject of physiology in particular and preclinical subjects in general. The teaching is supposed to be student centered, participative and done in small groups. The ground realties are far from the desired pattern of teaching-learning activity. Gross reduction of faculty strength in medical colleges by regulatory authorities, lack of passionate and committed young teacher, unsatisfied mid and entry level faculty focusing their attention most of the time on the prospects of promotion and financial compensation at the cost of imparting training in chosen fields have reduced the gains likely to arise out of best practice of medical education. There is competition to reduce the work load than to work harder and smarter. These observations are born out my personal experience and not intended to undermine the capability of junior faculty members or hurt their feelings. Great advancement in the information technology has been a boon and a bane to medical education. Students have access to wealth of information from printed and internet sources. An aggressive student is likely to get drowned in the ocean of knowledge as he tries to gather information from all possible sources. However, an average student will be a nonstarter as he is overwhelmed by the magnitude of information in each subject and multitude of the resources available. The teachers, young and old have continued to burden the students with information resulting in information overload, failing to give direction their learning and much needed clinical orientation to study of basic sciences. It is high time, all of us pledge to chop off the dead wood, provide relevant 29 information which forms the foundation for clinical practice; more than anything else make the learning of physiology enjoyable by being passionate about the subject and the profession. The computer assisted teaching-learning activity is a welcome change in understanding complex concepts of physiology.

Though these modules are designed for self study, hand holding of student by the faculty is needed in the beginning. The computer assisted teaching should not aim at replacing traditional teaching but be used as a potential supplement for learning of Physiology. Thus teaching should become facilitated, student centered ably assisted by tremendous advancement in information technology. The computer assisted experiments are not the true substitute for the live experimentation of the past. Reintroduction of some of the animal experiments may be considered to change the teaching-learning environment of practical physiology. It is likely to create curiosity in the young mind and harness their creative potential. There are repeated talks about changing the curriculum to address the changing need of medical education and health care delivery in the world in general and our country in particular. Sadly, this has remained a desire and a dream due to absence of periodic revision to address the societal needs. The curriculum has remained static over decades. Competency based curriculum, case based or problem based teaching-learning have been talked off quite often in medical education without a significant head way made in developing concrete plan for its implementation due to lack of evidence based on earlier experience. It is time for the young faculty to be creative, explore newer ways of making learning of physiology enjoyable and relevant. There is change in the pattern of investigation in medical practice. Advancement in technology has changed assessment of hematological profiles. Strangely, the hematology lab in physiology continues to teach/perform these redundant experiments. There is an urgent need to take a serious look at the curriculum by regulatory authorizes ably assisted by faculty and realign the experiments to address the need of the hour. There is greater emphasis on vertical and horizontal integration for comprehensive understanding of the problem than complete understanding of the subject. The rigid compartmentalization between the subjects is dissolving at rapid pace and likely to disappear shortly. As a stake holder in physiology, teaching faculty is likely to be the endangered species. It is necessary to reorient ourselves to remain in race for some more time and prevent extinction. It is necessary for the faculty members to be proactive, and creative. We need to work towards getting an opportunity to teach integrated physiology for final year students. There is need to start cardio-pulmonary, and neurology labs etc and get directly involved in patient care making ourselves an integral and inevitable part of the system. Further, there is need to do away with unwanted content in teaching of physiology to make its study of physiology contemporary. More than anything else, there is an urgent need for us to change the mindset to remain afloat without getting drowned!

Maj. Gen. S.L. Bhatia Oration Award

Adipokines gene expression in adipose tissue and its association with metabolic risk factors

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Key words: Adipokines, Adipose tissue, Metabolic syndrome, mRNA, Obesity, SAT, VAT

Metabolic syndrome (MetS) is associated with an increased risk of diabetic and cardiovascular mortality. The mechanisms underlying the metabolic syndrome are not well understood. Current evidence supports that abdominal, instead of total, obesity is a main determinant of the metabolic syndrome. The literature regarding VAT and SAT adipokines mRNA expression in Asians, especially Indians, is lacking. We document here the expression profiles of VAT and SAT adipokines mRNA in postmenopausal Indian women and their association with metabolic risk factors. According to NCEP-ATP III criteria for adults, metabolic syndrome is defined as presence of three or more out of five symptoms (WC >88 cm, TG >150 mg/dl HDL-C 130/85 and fasting glucose >110 mg/dl). Adipose tissue is an active metabolic tissue. Adipose tissue is

not only an energy storage depot, but is also regarded as an extremely active endocrine organ, 1 which secretes adipocytederived molecules, including lipid metabolites and adipocytokines (adiponectin, leptin, tumor necrosis factor TNF-α, interleukin (IL-6) etc. 2 Abnormal production of adipose tissue derived proteins is suggested to play a role in the pathogenesis of insulin resistance and the metabolic syndrome seen in relation to obesity. 3,4 There is strong evidence that, for a given adiposity, there is a large heterogeneity in the metabolic and cardiovascular risk mainly linked to the location of excessive adipose tissue. It is well documented that accumulation of visceral fat is associated with a higher risk for development of obesity-related diseases, such as Type 2 diabetes, cardiovascular disease, hypertension and dyslipidemia.5,6 Visceral adipose tissue accumulation is an important predictive factor of lipid, glucose or atherogenic disturbances, while location of adipose tissue in the lower part of the body is not associated with increased alterations at the metabolic level. Subcutaneous adipose tissue (SAT) and visceral adipose tissue (VAT) show functional differences. Visceral and subcutaneous adipocytes have different capacities to produce hormones and enzymes and variation in mRNA expression of adipokines. Furthermore, VAT has greater lipolytic activity than SAT from which region fatty acids are directly delivered to the liver via the portal vein. Thus, increasing the delivery of lipids to the liver and worsening insulin resistance in the liver promotes triglyceride synthesis which may exacerbate the dyslipidemia. It has been demonstrated that the removal of visceral fat mass (not the subcutaneous fat mass) improves insulin sensitivity (Einstein et al., 2005), but it does not imply that subcutaneous adipose tissue (SAT) may not contribute to metabolic abnormalities (Michaud et al.2013). The abdominal visceral adipose tissue (VAT) and subcutaneous adipose tissue (SAT) both are associated with metabolic syndrome and insulin resistance. The association of adipokines with metabolic syndrome at protein levels are well documented. However, their association at gene expression level are lacking. The present study was design to investigate various adipokines mRNA expression in adipose tissues (VAT and SAT) and its correlation with metabolic risk factors and insulin resistance in post-menopausal women. A total of 108 postmenopausal women were recruited prospectively; 54 were with metabolic syndrome (cases) and 54 were without metabolic syndrome (controls). Blood sample, visceral and subcutaneous adipose tissues were obtained. Biochemical parameters (plasma insulin, plasma glucose and serum Adiponectin, resistin, IL-6, Leptin and TNF-α) were estimated by enzymatic methods. mRNA expression was evaluated by real-time PCR. In cases, the mean serum resistin, leptin, TNF-α, IL-6 was significantly higher while serum adiponectin was significantly lower as compared to controls. Further, the relative mean VAT mRNA expression of both leptin and TNF-α and expression of SAT leptin also lowered significantly in cases as compared to controls. However, the relative mean mRNA expression of TNF- α did not differ significantly between the groups, that is, it was found to be statistically the same. In controls, the relative mean mRNA expression of leptin was significantly higher in SAT as compared to VAT; however, the expression of TNF-α was found similar between the two tissues. Conversely, in cases, the relative mean mRNA expressions of both leptin and TNF- α was found significantly different and higher in SAT as compared to VAT. The relative mean SAT resistin mRNA expression was significantly higher and over expressed in cases as compared to controls and VAT resistin mRNA expression in cases significantly low as compared to controls. In both groups, the mean IL-6 mRNA expression of SAT was higher than VAT and higher in cases than controls. The mean VAT and SAT adiponectin mRNA levels were significantly lower in cases than controls. However, the mean VAT and SAT adiponectin mRNA levels were similar between the groups. In previous studies, the plasma concentration of adiponectin was found to be decreased in conditions associated with the metabolic syndrome (MetS), overweight and obese subjects, T2D patients, and dyslipidemia sufferers. In the present study, we have found lower serum adiponectin concentration in cases as compared to controls. Matsuzawa et al also reported reduced plasma adiponectin levels in obese subjects.7 Moreover, the study also found significantly lower VAT and SAT adiponectin mRNA levels in

postmenopausal obese as compared to postmenopausal non-obese. The findings of the present study are in good accordance with one previous study which showed 2 to 2.5-fold lower adiponectin mRNA in the VAT of T2D patients than controls.8 Further, the findings of the present study are also consistent with Fischer et al9 who showed significantly lower adiponectin gene expression and protein content in omental adipose tissue (VAT) and SAT of obese as compared to non-obese. However, the present study did not agree with that of Young et al,10 which showed no difference in VAT adiponectin mRNA levels of obese and non-obese women. The manifestation of a potential modulatory/regulatory role of VAT adiponectin mRNA level in metabolic risk factors may be attributed to AMP-activated protein kinase which regulates lipid metabolism. β-oxidation of fatty acids is increased secondary to the activation of AMP-activated protein kinase.11 Findings of resistin gene expression in humans are limited and controversial.16 Some reports have shown that mRNA or protein expressed in human adipose tissue, while others have reported the absence/poor mRNA expression in this tissue.12,13 In the present study, it was also demonstrated that significantly higher serum resistin in postmenopausal obese women was found compared with postmenopausal non obese women. The findings are in good agreement with previous findings, which show significant effect of serum resistin on insulin action, potentially linking obesity with IR. 14,15 In the present study, significantly lower relative VAT resistin mRNA expression was found in postmenopausal obese women compared with postmenopausal non obese women. These results support the findings of Rajala et al. who showed that the resistin mRNA expression was suppressed in the obese. 17 In the present study, we found significantly higher SAT resistin mRNA expression in the obese compared to non-obese. Our finding is in contrast with Baranova et al18 who reported no difference in SAT resistin mRNA expression in the obese with and without insulin resistance. However, a few reports show decreased mRNA and protein expression in isolated subcutaneous and omental adipocytes. 19.20 Our findings corroborate with a cohort study by Smith et al21 who reported higher expression in obese women. Moreover, a recent report showed higher resistin mRNA expression of both visceral and subcutaneous adipose tissues in obese than non-obese women. 22 IL-6 is a cytokine, which mediates several functions in host defense and promotes atherogenesis, dyslipidemia, hypertension and insulin resistance through activated macrophages and lymphocytes (Bastard et al,2007.IL-6 has direct effects on insulin signaling in adipocytes and hepatocytes (Rotter et al., 2003). IL-6 reduces lipoprotein lipase activity in adipose tissue and increases basal lipolysis (Trujillo et al.,2004). In adipocytes, IL-6 has been demonstrated to inhibit the insulin signaling pathway by up-regulating SOCS3 expression, which in turn is known to impair insulin-induced insulin receptor (Rotter et al,2003). In present study the serum IL-6 in postmenopausal women with metabolic syndrome was found significantly higher as compared to postmenopausal women without metabolic syndrome. Our finding is in well accordance with a study who reported significantly higher IL-6 protein in the serum of patient with type 2 diabetes (Lazar, 2005). In the present study we have found significantly higher IL-6 mRNA expression in SAT as compared to VAT in postmenopausal women with metabolic syndrome. Our finding is in contrast with earlier findings who reported higher IL-6 expression in VAT than SAT in obese (Fried et al., 1998; Mohamed-Ali et al., 1998). However, one study also reported higher expression of IL-6 in VAT than SAT in cultured cells (Fain et al..2004). This contrast result may be per se differences in dietary composition, life style between western and eastern societies (McKay and Mathers,2011). Increased level of IL-6 in SAT suggests that SAT may be an important source of adipokines which along with VAT affects glucose and lipid metabolism. TNF-α has been shown to be increased in obesity, type 2 diabetes, and atherosclerosis. A recent study by Selcuk Gormez et al. shows higher expression of TNF-α in subcutaneous adipose tissue of metabolic syndrome's subjects23 . Bullo et al. also reported that TNF-α mRNA expressions of the adipose tissue in obese and morbid obese patients were significantly higher than in controls.24 In the present study, VAT TNF-α mRNA expression was

significantly lower in cases as compare to controls. The present study did not find any significant difference of SAT TNF-α mRNA expression between cases and controls. This finding corroborates with Koistinen et al. who showed similar TNF-α mRNA expression in 7 lean and 10 obese nondiabetic and 9 type-2 diabetic men.25 However, a recent study by Selcuk Gormez et al. shows higher expression of TNF-α in subcutaneous adipose tissue of metabolic syndrome's subjects23. Our results show that TNF-α mRNA expression was higher in SAT as compared to VAT of case group. Our finding is consistent with Bullo et al. who reported that TNF-α mRNA expressions of the adipose tissue in obese and morbid obese patients were significantly higher than in controls.24 Leptin is a 16-kDa hormone secreted by adipocytes. Leptin plasma concentration and mRNA expression in adipose tissue26 are directly related to obesity severity, as an increase of fat mass is associated with an increase of leptin, which makes leptin an indicator of total fat mass. Leptin, however, is mainly produced by human SAT, responsible of 80% of total leptin production. Previous studies from several groups27 have provided the evidence for a regional difference in leptin expression, as they demonstrated higher leptin mRNA levels in SAT than in VAT samples from centrally obese and non-obese subjects. Montague et al. also found higher expression of leptin gene in subcutaneous adipose tissue compared to visceral adipose tissue. 28 In the present study, we have found higher serum leptin concentration in cases as compared to controls. The finding is in well agreement with previous findings, which shows significant effect of serum leptin on insulin action, potentially linking obesity with insulin resistance.30 Our finding demonstrates that SAT leptin mRNA expression was significantly lower in cases as compared to controls. This finding is consistent with the recent study, which indicates that SAT leptin expression was lower in women with increased visceral fat volume.29 However, our results also demonstrate that leptin mRNA expression was higher in SAT as compared to VAT in both the groups. This is in support of the study of Montague et al. who also found higher expression of leptin gene in subcutaneous adipose tissue compared to visceral adipose tissue.28 The mechanisms underlying the metabolic syndrome are still not well understood. Adipose tissue is an important organ to produce various cytokines that are involved in inflammatory pathways. Adipose gene expression of pro-inflammatory (IL-6, TNF-α) cytokines is elevated with obesity, whereas the expression levels of adiponectin lowered in obese individuals. Previous work has shown that glucose tolerance and insulin sensitivity are reduced in individuals with elevated circulating levels of inflammatory biomarkers. In addition, a few studies also show that glucose tolerance and insulin sensitivity are negatively related to adipose tissue expression of inflammatory genes. These data together suggest a link between adipokines and metabolic syndrome.

R Srinivasan Prize

RS1

Effect of recumbent body positions on dynamic lung function parameters in healthy young subjects

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Background: Ideally spirometry is done in sitting position until the subject is unable to do so. Hospitalized patients often assume recumbent body positions irrespective of underlying pathology. The changes in body position can cause changes in lung function, and it is important to understand the physiological basis of the change so that the same can be utilized in clinical setup for assessment of respiratory function.

Objective: To assess spirometric parameters (FVC, FEV1, FEF25-75%, PEF) in the supine, crook lying and Fowler's (450) position in young healthy individuals by using computerized spirometry.

Methods: A cross-sectional study was conducted in Department of Physiology, King Georg's Medical University campus. Spirometry was performed for obtaining FVC, FEV1, FEF25-75%, PEF in different recumbent position according to American Thoracic Society guideline.

Results: 131 subjects with a mean age of 20.15 ± 2.71 years, BMI 21.20 ± 3.28 kg/m2 was included in this study. Repeated measures ANOVA with post hoc Bonferroni test was used to compare the mean values between each body position. There was a significant difference in the FVC, FEV1, FEF25-75%, PEF values between the Fowler's position, crook lying and the supine.

Conclusion: Recumbent body position influences spirometric parameters in healthy young subjects. We demonstrated that spirometric values are higher in the Fowler's position than in the supine or crook lying position.

RS2

The temporal trend of vascular function in women with gestational diabetes

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The objective of the study was to assess the temporal changes in vascular function during pregnancy in healthy women and in those with gestational diabetes mellitus (GDM). Assessment of vascular function was done at three time points, 11-13^{+5} week, 20-22^{+5} week and 30-32^{+5} week, by Flow-Mediated Dilation (FMD), Augmentation Index (AIx) and carotid-radial Pulse Wave Velocity (crPWV) in women (n=100) with singleton pregnancy. Out of the 100 women, 20 developed GDM, which was compared with 20 healthy age-matched pregnant women in a nested case control design. Women with GDM had lower FMD% in third as compared to first trimester [6.77 (4.36-9.96) vs. 9.76 (6.66-16.61)%; p = 0.026], however it was similar on inter-group comparison. AIx was significantly higher in GDM than healthy pregnancy at both first [15.35±10.57 vs. 6.45±9.81%; p <0.05] and second trimesters [15.00±8.44 vs. 2.50±9.01%; p<0.05]. Higher functional arterial stiffness in early pregnancy, as assessed by AIx, differentiates

women with GDM from those with healthy pregnancy.

Key words: Gestational diabetes mellitus, pregnancy, arterial stiffness, flow-mediated dilatation, vascular function

RS3

TO EVALUATE THE NEURO-PSYCHOLOGICAL TESTS IN ACTION AND STRATEGY GAMERS

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Background: Cognition refers to the set of all mental abilities and processes related to knowledge. Gaming has been found to influence various aspects of cognition like Visuo-spatial attention, executive function, alertness and problem solving skills. However, few studies have evaluated the effect of different genres of gaming on cognition.

Objectives: The present study was done to assess the influence of playing action and strategy games on cognitive functions by using neuro-psychological tests and to compare the results between them.

Materials & Methods: 100 young healthy adults who played digital games for > 3 hrs/week for at least 3 months duration were recruited in the study and were equally divided into two groups:- Group 1 - (action gamers). Group 2 –(strategy gamers). Neuro-psychological tests like, Letter cancellation test (LCT), Trail making test A&B (TMTA&B), Ruff figural fluency test (RFT) were administered and scoring done as per standard manuals.

Results: The time taken to complete LCT, TMT A &B was lesser in action gamers as compared to strategy gamers whereas, it was lesser for RFT in group 2 as compared to group 1. A statistically significant difference (p =0.022) was obtained only in the mean TMT A scores. Number of omissions in LCT were lesser & number of patterns in RFT were more in group 2 as compared to group 1.

Conclusion: Our results indicated that playing action & strategy games had differential influence on cognition. Visuo-spatial cognition and alertness was better in action gamers whereas, strategy gamers exhibited better problem solving skills.

RS4

Correlation of Body mass index (BMI) with thyroid function in euthyroid pregnant women in Manipur, India

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Background: Body mass index (BMI) is significantly increased during pregnancy due to gain of weight due to normal progression of pregnancy. The exact influences of thyroid function on BMI are ill defined in euthyroid pregnant women.

Objective : To correlate serum levels of free triiodothyronine (FT3), free thyroxine (FT4), and thyroid stimulating hormone (TSH) level with BMI of participant normal pregnant women in all the three trimesters.

Material and Methods: In this cross sectional comparative study, total of 210 healthy pregnant women in different trimesters attending Obstetrics Outpatient department (OPD) of the RIMS hospital for antenatal check-up were consecutively selected. Estimation of serum FT3, FT4 and TSH level was done by ELISA based methods. The Correlation of BMI with serum levels of FT3, FT4 and TSH was done using Pearson correlation test by SPSS version 21software.

Results: TSH level of participant normal pregnant women showed significant positive correlation with BMI during first (r= 0.254 and p= 0.034) and second trimester (r= 0.263 and p= 0.028) of pregnancy. FT4 level showed significant negative correlation in second (r= - 0.454 and p= 0.000) and third trimester (r= -0.351 and p= 0.003) of pregnancy. Correlation between BMI and FT3 level showed no significant association in any of the trimesters.

Conclusion: BMI correlates positively with TSH level in first and second trimesters while it correlates negatively with FT4 level in second and third trimesters but failed to demonstrate significant association with FT3 level in any of trimesters in euthyroid pregnant women.

RS 5

Capsaicin fails to produce changes in contractile tension in large gut of neonate rats

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Background: Capsaicin, the main pungent ingredient of chili pepper, is known to mediate its contractile response in large gut in adult rats via TRPV1 (Transient receptor potential subtype 1) receptors and involves nitric oxide. However, little is known about the role of capsaicin and its receptors in neonate gut. Therefore, the present study attempted to assess the effect of capsaicin in large gut of neonate rats.

Materials & Method: Using organ bath preparations, *in vitro* isometric contractions were recorded from isolated large gut segments (colon and rectum) in neonate (10-16 days old) albino rats. Contractile tension and frequency of spontaneously occurring contractions were recorded with the help of force transducer and computerized chart recorder, in the presence or absence of capsaicin (0.01nM-3µM). Further, the action of capsaicin was assessed after pretreatment with capsazepine (1µM), a TRPV1 antagonist and L-NAME (100µM), a nitric oxide synthase inhibitor. Same procedure was followed for adult rat gut.

Results: Capsaicin raised contractile tension in colon and rectum of adult rats ($p<0.05$, n=6, two way ANOVA) but no such response was observed in neonate rats ($p>0.05$, n=6). Capsazepine blocked ($p<0.05$, n=6) capsaicin response in adult colon only. L-NAME potentiated capsaicin induced response in adult rectum and neonate colon ($p<0.05$, n=6). Both capsazepine and LNAME decreased the frequency in gut segments ($p<0.05$, n=6) except in colon of neonate.

Conclusion: Failure of contractile response in neonate colon and rectum to capsaicin indicated the appearance of capsaicin receptors during later stage of gut development. However, capsaicin receptors may be involved in determination of contractile frequency in neonate rat also.

Harish Gupta Prize

HG1

Alpha and beta EEG activity at different brain regions in response to altered breathing patterns in normal human subjects

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Introduction : Hypoxemia, hyper/hypocapnia due to altered respiratory patterns (eg. in COPD patients) cause changes in cortical functions. But presence of other confounding factors in these patients makes it imperative to study the effect of different breathing patterns on EEG activity at various brain regions for normal subjects.

Aim: The study aims to investigate the effect of different breathing patterns on alpha and beta activity over different brain regions.

Method: 30 healthy male subjects were selected for the study and asked to perform 1) 3 minutes of deep breathing (DB), 2) Breath holding (BH) and 3) hyperventilation (HV) with 30 respiratory cycles/minutes. EEG was recorded at frontal parietal and occipital sites using 10-20 system of electrode placement before, during and after each interventions.

Result: There was a generalized and significant increase in alpha power over the posterior parieto-occipital regions as compared to frontal for all the interventions. The relative increase under rest was more for alpha as compared to beta as reflected in the alpha/beta ratio (11.20±10.38 & 8.78±5.47 at F3 & F4 to 39.75±31.17 & 38.46±37.19 at P3 & P4 and 35.51±20.27 & 42.26±24.84 at O1 & O2). No significant lateralization was present in any of these brain regions. However, percent change reveal that both alpha and beta activities showed an increase following hyperventilation in the frontal region (approx 40±10% at F3 & 25±15% at F4) whereas, they decreased in all the regions post BH but only alpha decreased posteriorly post DB (up to 20±5% at P3 & 18±5% at P4).

Conclusion: The alteration in post-interventional cortical EEG activities seems to have alpha preponderance which might be sensitive to relative hypoxemia/ hypercapnia or hypocapnia, having differential response to the respiratory interventions.

HG2

Effect of Sudarshan Kriya Yoga and Pranayama (SKY & P) on Mental Health of Medical Students

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Background: Medicine is considered as more demanding and stressful than any other courses. Medical studentsare under significant psychological stresswhichmay adversely influence academic performance.SKY & P (a specific sequence of varying breathing rates separated by brief periods of normal breathing) has demonstrated significant reduction in anxiety scores and resilience to stress. **Objectives** of present study was to assess the effect of SKY& P on the mental health of medical students, first by finding the number of students having depression, anxiety and stress and then using SKY as intervention for improving psychological well-being, cognition and mental status.

Materials and Methods: Consenting, apparently normal medical students (n=30) [20 males and 10 females], aged between 18-22 years, in the study with single group pre-post design. Depression, anxiety and stress were assessed by DASS-42, cognition by Digit Vigilance Test (DVT) and Color Trails Test (CTT) and Psychological Well Being (PWB) assessed by Questionnaire on PWB (PWB-20).Scores were collected before and after the SKY training of 4 weeks and subjected to statistical analysis.

Results:DASS score of some medicalstudents were exhibiting depression, anxiety and stress in pre-SKY group,total score being higher in females, which lowered significantly by69.36%, 58.94%, and 57.30% respectively in post-SKY group. Significant improvement observed by decrement in the total time of CTT 1 and CTT 2 by 29.33% and 22.78% respectively.Also in DVT, decrement in total time taken by 11.06% and errors by 53.15% showed improved sustained attention. Impact of SKY training on psychological well-being was increment in the mean scores by 17%.

Conclusions: Participants improved significantly on all positive psychometric measures of psychological health and well-being, including positive effect, satisfaction with life, and mindfulness. SKY& P, as a tool to handle stressful situations, could result in improvement of sustained attention, perceptual tracking and simple sequencing, and also mental flexibility, thus paving way for their academic excellence.

HG3

Co-localization of IR and LDLR in type-II diabetes: A cause of atherogenesis.

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Background: Each of the two receptors viz. Insulin receptor (IR) and LDL receptor (LDLR) exists in a free functionally active state in biological system. Earlier reports had shown that Insulin maintains the free existence of these receptors. In type-I diabetes these two receptors remain co-localized and in adherence.

Methods: Anthropometric measure of the volunteers participated in the study. Spectrophotometric analysis of plasma parameters, insulin estimation by specific Kit assay and Western blot analysis for the receptor protein expression were the part of the methodology used for this study.

Results: In type-II diabetes these receptors also remain adhered. Since in type-II diabetes insulin receptor is defective, insulin cannot send its signal through its receptor. So in type-II diabetesabsence of insulin signaling makes these two receptors co-localized and co-adhered. Although in type-II diabetes hyperinsulinemia exists, insulin cannot dissociate the receptors as the receptor function is impaired. This association of IR and LDLR makes the receptors non-functional and does not allow LDL receptor to bind and remove plasma LDL through endocytosis. Hence LDL accumulation starts in blood vessels and initiates atherogenisity.This report presents the plasma parameters of type-II diabetic subjects and the blots of the two receptors' association in their leukocytes.

Conclusion: Like type-I diabetes insulin and LDL receptors also remain adhered in a non-functional mode in type-II diabetes.

HG4

Substance Abuse among Undergraduate Medical Students of District Patna, Bihar

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BACKGROUND: Objective is to find out the prevalence of substance abuse among the undergraduate medical students of District Patna, Bihar and the depending socio-cultural determinants and demographic variables. Medical students and physicians in training and in practice are at risk for excessive alcohol use and abuse, potentially impacting the affected individuals as well as their family members, trainees, and patients.

METHODS: A Descriptive cross sectional study was undertaken in

- Patna Medical College and Hospital,
- Indira Gandhi Institute of Medical Sciences,
- Nalanda Medical College and Hospital and
- All India Institute of Medical Sciences, Patna.

Subjects were given a pretested and self-administered questionnaire in printed format with complete confidentiality. The Internship students of the medical colleges were excluded out of the study population. Attempts were made to track the absentees on two occasions, after which they were excluded.

RESULTS: A total of 655 medical students were involved in the study. The overall life time prevalence of substance abuse was 26.72% whereas the current user prevalence was 17.6%, more among males as compared to females (39.5% vs 7%). Alcohol was the most commonly used substance of abuse followed by tobacco (83.48%). Friends (about 77.14%) were the most common source of introduction and the most common cause attributed by abusers for their consumption was Curiosity (84.57%). About 33.91% of the still abusers

were consuming such substances on a daily basis. Parents of majority of the students had no clue about their ward's abusive habit. A big chunk of students were such who's either of the parents were in habit of substance abuse.

CONCLUSIONS: It is important to address this topic as early as possible until it is too late. It is time that such policies, guidelines and programmes are developed for affected medical students in India. It is high time one re-examine the arrangements in medical schools for the availability of assessment and student counselling services.Research in this domain during the past 40 years is the outcome of random survey studies. It has been well established that the problem exists. We need to go beyond surveys to research on risk factors and undertake long term process based systematic strategy to effectively address the health of our own colleagues

HP5

Heart Rate Variability as a measure of cardiac efficiency at higher range of normal basal heart rate

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Background- Basal heart rate (HR) of an individual is an established parameter to measure an individual's aerobic power or cardio-respiratory fitness. However, whether higher range of HR as compared to lower range (within physiological limits) have different autonomic modulation of heart (in terms of heart rate variability; HRV) and indicate poor physical fitness in young healthy males is not clearly known.

Objective-Therefore our objective was to study the status of cardiac efficiency at higher range of basal HR as reflected through HRV changes.

Materials & Methods- 27 males (18-25 years) were selected and subdivided into two groups, low basal HR (LHR); 61-70 bpm (n=15) and high basal HR (HHR) ; 81-90 bpm (n=12). Lead II ECG was recorded for the calculation of time domain measures of HRV assessment.Thereafter, subjects performed Harvard Step Test (HST) and subsequently Physical fitness index (PFI) was calculated.

Observations –Time domain parameter i.e., RMSSD and pNN50 was significantly high in LHR group (58.3 ±23.5 &37.5±17.3 respectively) compared to HHR group (50.1±13.9 & 25.6±18.9 respectively). PFI was also significantly low in HHR group (54±18.3) compared to LHR groups (75.3±14.1).

Conclusion-Thus it may be concluded that low physical fitness with reduced parasympathetic tone in HHR group of apparently healthy males as compared to stronger parasympathetic activity in LHR subjects is suggestive of poorer cardiac efficiency and necessitates lifestyle modification in the individuals with higher range of basal HR.

Free Oral Papers:

FP/01

Study of Peripheral nerve conduction parameters in patients of Type 2 Diabetes Mellitus

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Background: Diabetes is a heterogenous group of disorders characterised by hyperglycemia resulting from defects in insulin secretion, insulin action or both. Type 2 diabetes mellitus is caused by decreased sensitivity of target tissues to the effect of insulin. This reduced sensitivity to insulin is often called insulin resistance. Nerve conduction study is an electrodiagnostic test widely used for the assessment of neuropathies.

Objectives: To study nerve conduction parameters in type 2 diabetes mellitus patients and control group and compared with themselves.

Material and methods: Our study included 50 diagnosed cases of type 2 diabetes mellitus depending upon the criteria of fasting blood sugar (FBS) >126mg/dl between 30-60 years of age and 50 age and sex matched healthy subjects as control. Nerve conduction studies were performed in all the study participants.

Motor distal latency, amplitude, conduction velocity and F wave of median, ulnar, peroneal and tibial nerves, sensory conduction velocity and amplitude of median, ulnar and sural nerves and H reflex of posterior tibial nerves were measured.

Results: Compound Muscle Action Potential showed prolonged distal latency, reduced amplitude and conduction velocity of median and peroneal nerves. Whereas prolonged distal latency and reduced conduction velocity was observed in tibial nerve. Sensory Nerve Action Potential showed reduced amplitude and conduction velocity in sural nerve. Further F waves were prolonged in median, ulnar, peroneal and tibial nerves.

Conclusion: In conclusion, there is neuronal involvement in patients of type 2 diabetes mellitus.

FP/02

Study of Brainstem Auditory Evoked Potential in patients of Type 2 Diabetes mellitus.

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Background: Diabetes mellitus is a metabolic disorder of carbohydrate in which blood glucose levels are abnormally increased due to relative or absolute insulin deficiency. Cranial neuropathy is one of the common late complications of Diabetes mellitus. Long standing disease may be associated with hearing loss. Brainstem Auditory Evoked Potential (BAEP) is a noninvasive electrophysiological procedure to detect early impairment of Acoustic nerve & CNS pathway even in absence of specific symptoms.

Objective: To study BAEP parameters in Type 2 Diabetes mellitus patients & control group & compared with themselves. Material & methods : Our study included 50 diagnosed cases of Type 2 Diabetes mellitus depending upon criteria of HbA1C > 6.5 & 50 healthy subjects as control between 30 - 60 years of age. The waves routinely analysed in BAEP were number I – V. Absolute latencies of each peak (I,II,III,IV & V) & Inter peak latencies (IPL) I-III , I- V & III-V were measured in all study participants. Results: Absolute latencies of all the waves in both ears were significantly prolonged in Type 2 Diabetes mellitus patients than control group. Inter peak latencies I-III, I-V & III-V in both ears showed statistically significant prolongation in Type 2 Diabetes mellitus patients.

Conclusion: Increase in Absolute & Inter peak latencies in BAEP waves concluded that there is an abnormality in neural conduction in auditory pathway in Type 2 Diabetes mellitus patients.

FP/03

Role of preoptic area thermo transient receptor potential vanilloid type II (TRPV2) and type III (TRPV3) channels in thermoregulation in rats

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Background: Preoptic area (POA) is one of the most important neural sites involved in body temperature regulation**.** TRPV2 and TRPV3

channels are non-selective cation channels and its role in thermosensation has been observed in vitro study.

Objective: The effect of TRPV2 and TRPV3 agonists & antagonists on body and brain temperature were studied in vivo.

Methods: The study was conducted in 18 male Wistar rats. Under thiopentone sodium anesthesia (40 mg/kg BW) the surgery was performed for the implantation of a bilateral guide cannula, radio transmitter TA10TAF–40 (DSI, USA) and K- type thermocouple as per De Groots atlas. Injections were given at POA, body temperature (Tb) & brain temperature (Tbr) was recorded. The sites of injections were confirmed histologically. Immunohistochemistry was performed for the localization of TRPV2 &TRPV3. The statistical comparison was made between pre and post injection record using repeated measure ANOVA and time matched control with injection was compared with paired t-test.

Results: Body temperature recorded in 18 rats range between 37.46 ± 0.27°C – 37.92 ± 0.4°C and brain temperature 36.22± 0.18°C–37.45 ± 0.39°C· The injection of TRPV2 agonist (probenecid, 0.4µg/0.2µl) in preoptic area produced significant increase in body and brain temperature. The increase in Tb lasted for 45 minutes whereas the Tbr lasted for 2h. The injection of TRPV3 agonist (Camphor) and antagonist (Ruthenium red) doses (0.4µg/0.2µl) in preoptic area produced no effect on Tb & Tbr. The florescent signal against TRPV2 channel was detected in preoptic area.

Conclusion: The TRPV2 channel found in POA and plays a role in thermoregulation.

FP/04

Effect of Working Memory Load on Visuospatial Search: A qEEG Study

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Background: Humans can process just up to 4 integrated items of information in the working memory. However, the neural mechanisms limiting the working memory capacity still remain unclear. High temporal resolution of Electroencephalography (EEG) makes it the ideal tool to study the temporal dynamics of brain networks. In the current study, we investigated the effect of working memory load on visuospatial search in a task using EEG.

Method: Twenty healthy participants performed a visuospatial working memory task that involved matching of encoded pairs of identical abstract pictures in a hidden array. The task consisted of three memory loads (Memory load I, II & III with 3, 6 & 8 pairs of pictures, respectively). Brain activity during the task was recorded using 128 channel EEG. Independent component analysis was performed on the EEG data of correct trials and the dipole locations of the components were solved. Brain components that accounted >85% scalp map variance were clustered using *k*-means clustering algorithm. For each component clusters, event related spectral perturbations (ERSP) of the memory loads during visuospatial search were compared.

Results: Memory load had significant effect on the error rate ($F(2, 57) = 13.94$; $P<0.0001$). Out of 9 component clusters identified, three clusters with their centroids located at left insula, left middle frontal gyrus and right cingulate gyrus showed significant difference in ERSP ($P<0.05$) during visuospatial search.

Conclusion: Spectral perturbations during visuospatial search in these brain regions could represent the coping strategy that brain deploys when challenged with high memory load.

FP/05

SPATIAL MEMORY AND Akt- AND Tau-PROTEIN PHOSPHORYLATION IN HIPPOCAMPUS IN SUCROSE INDUCED RATMODEL OF TYPE 2 DIABETES MELLITUS

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Introduction: Spatial memory has been reported to be impaired in rat and mouse models of diabetes mellitus, along with molecular links between diabetes and Alzheimer's disease.

Objective: 1. To examine spatial memory throughout lifetime in rat-model of high-sucrose diet induced obese type2 diabetes as compared to prior performance-matched control rats of same age tested together. 2. To observe hippocampal Akt and Tau-protein phosphorylation, along with liver Akt, between diabetic and control rats.

Method: Performance matching of rats before recruiting 'case' and 'control' rat-pairs factored out behavioral variation. Radial 8-arm maze and Morris water maze tests for spatial navigation memory were performed over varying durations of diabetes, along with the 'pattern-suppression test' for context-discriminating recognition memory (non-spatial). Akt phosphorylation in liver and Akt- and Tau-protein phosphorylation in hippocampal brain tissue was determined by western-blot.

Result: Paired statistical comparison between diabetic and control rat showed no significant difference in spatial and non-spatial cognitive task performance. While liver tissue of diabetic rats had decreased Akt phosphorylation (Serine-473) indicating hepatic insulin resistance, there was no difference in Akt phosphorylation (Serine-473) in brain hippocampal tissue between diabetic and control rats.

Conclusion: High-sucrose diet induced diabetes with moderate hyperglycemia over longduration and documented hepatic insulin resistance had no effect on spatial and non-spatial cognitive task performance. No relation was found between brain Akt→Tau protein signaling and impairment of hepatic insulin signaling.

FP/06

A Comparative Study of the Effects of Yoga on the various cognitive functions of "Special" persons.

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Background: Practise of Yoga, especially the Pranayamas and meditation are known to affect the cognitive functions of population. This study aims at exploring the comparative effects on different aspects of cognitive function Tests (CFTs) in "special" population.

Material and methods: Forty "Special" persons attending a special school were instructed *Naadishodhan*, *Kapalbhati pranayama* and *Aum Chanting* and performed them regularly under strict supervision for thirty minutes daily for three weeks, barring Sundays. The parameters were measured twice, first before the intervention (baseline score) and later after three weeks of Yoga practice (follow-up scores). CFTs were done for eight parameters, namely, verbal analogies, general information, picture vocabulary, numbers reversed, memory for words, visual spatial relation, picture recognition and planning. ANOVA-Fisher's test for descriptive analysis and Tukey HSD tests for multiple comparison of dependent variable were performed to know the order of significance.

Results: Highly significant improvements were observed in the follow-up scores of all eight

parameters as compared to the baseline scores. Improvements were comparatively equal in all six of the eight parameters. The number reversed improved significantly more compared to all other parameters. Visual spatial relation also showed significantly better improvement than other four of the seven parameters.

Conclusion: Number reversing ability tests the short-term (working) memory, mainly a function of pre-frontal cortex. During visual spatial relation, based on the preanalysed information coming from different sensory areas the prefrontal cortex sends commands into the basal gangliothalamic feedback circuit for motor planning. Hence, this study suggests that the pranayama and meditation may have better effect in the functioning of pre-frontal cortex.

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FP/07

Visual and brainstem-auditory evoked potentials in obese and overweight individuals

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Background: Obesity, a state of excess accumulation of body fat, is known to be a major health risk owing to its widespread complications. Involvement of central nervous system (CNS) in obesity has been growingly appreciated too. However, there exists a paucity of data for cranial nerve involvement in obese and overweight individuals.

Objectives: The study, hence, aimed to record visual and brainstem-auditory evoked potentials in overweight and obese individuals to assess the affection of CNS conduction.

Material and methods: Pattern reversal visual evoked potentials (PRVEP) and brainstem auditory evoked potentials (BAEP) were recorded in 85 subjects (30 obese, 30 overweight and 25 controls) in the age group of 18-70 years. Indian-specific BMI (body mass index) cutoff points were used. Subjects with metabolic, endocrine, demyelinating pathologies, abnormal otological and ophthalmological examinations were excluded from the study. PRVEP P100 latency and BAEP absolute latencies I, III and V and interpeak latencies I-III, III-V and I-V were compared and analyzed among the three groups using one way ANOVA and Tukey multiple comparison tests.

Results: The study demonstrates statistically significant prolongation ($p<0.05$) of PRVEP P100 latency, BAEP absolute latency of wave III and V and interpeak latencies I-III and I-V in obese and overweight subjects as compared to controls with no statistically significant differences between obese and overweight groups.

Conclusion: Visual and brainstem auditory responses are deranged in obese and overweight individuals indicating CNS conduction delays. The influence of raised BMI should be borne in mind during clinical interpretation of the tests.

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FP/08

Effect of Intracellular Hydration on Isometric Strength & Aerobic Capacity in

Different Age Groups of Elite Young Male Athletes Playing Different Sports

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Background: Changes in body components occur among different sports, but their impact on functional performances is still unclear. The study was aimed to investigate the effect of sports specific physical activity on total body water (TBW) & its compartments (i.e., ECW & ICW), isometric strength and aerobic capacity (VO2 max) and their relationship among young male athletes (mean age, 16.5 ±1.91 yrs) from different sports and age categories.

Methods: Three hundred nineteen (N=319) athletes from different sport disciplines (football, n=93; hockey, n=106; table tennis, n=68 and badminton, n=52) were evaluated according to their different age categories (viz., U-15, U-17, U-19 and U-21) at the end of preparatory phase. Ninety three (n=93) age-matched (mean age, 16.3 ±1.60 yrs) sedentary boys also served as control group. Whole body bio-electrical impedance analysis (BIA) was performed using a multi-frequency analyzer (Maltron Bioscan 920-2, Maltron International, Rayleigh, Essex, UK). FFM and TBW were calculated using Asian based prediction equations from manufacturer's software. Thereafter, maximal isometric grip & back strength and 20 meter shuttle test (bleep test; for VO2 max) were conducted followed by standard procedure.

Results: One-way ANOVA showed significant differences ($p<0.01$) in maximal grip & back strength, VO2 max, TBW, ECW and ICW among the sports and control group of particular age categories. Most of the cases, superior hydration status along with superior functional characteristics was found in hockey and also to some extent in badminton players. Table tennis players whereas possess most inferior values close proximity with the sedentary boys. TBW and its compartments showed positive & significant ($p<0.01$) correlation with both isometric strength and VO2 max. However, age, BMI & FFM adjusted multiple regression analysis revealed that only ICW and relative ICW has significant positive relation ($p<0.01$) with functional performance.

Conclusion/Implications: TBW alters due to different sports activities and increases with functional capacities. Loss of ICW but not TBW could be the risk of decreasing upper body strength and aerobic capacity. Therefore, attention should be given in postexercise rehydration strategy. Additionally, measures of intracellular compartment should be performed throughout the season in athletes.
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FP/09

Heart Rate Variability during various phases of Menstrual Cycle

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Key words: Low frequency, High frequency, LF/HF ratio, Heart rate variability, oestrogen, progesterone, menstrual cycle

Background: The menstrual cycle is a physiological process which affects the bodily functions of the

women because of the fluctuations in the sex hormone level during the different phases. Menstrual cycle is divided into three phases namely menstrual, proliferative and secretory phases. Physiological effects of menstrual cycle on the autonomic function has been extensively examined. Heart rate variability has become a popular tool for assessing the activities of autonomic nervous system. Significantly greater heart rate variability and parasympathetic influence on myocardium in the follicular phase and greater sympathetic activity in the luteal phase in comparison to other phases of the menstrual cycle have been reported in the literature.

Aims and Objectives: 1.To study Heart Rate Variability across the three phases of menstrual cycle in healthy young women. 2. To compare the mean values of LF (Low frequency), HF (High frequency) and LF/HF ratio in heart rate variability across the three phases of menstrual cycle. 3. To evaluate the relationship between the autonomic nervous control on the heart and endogenous sex hormone fluctuations during three phases of menstrual cycle with respect to menses.

Materials: Stethoscope, Medicaid Physiopac, Kubois software version 2.1 for HRV analysis

Methods: A cross sectional type of study. 30 female subjects were considered for the study after applying inclusion and exclusion criteria and after taking informed written consent.

Results: Mean HR, LF (nu) and LF/HF ratio was found to be higher and statistically significant during secretory phase as compared to menstrual and proliferative phase of menstrual cycle. HF (nu) on the other hand was found to be higher and statistically significant during proliferative phase as compared to menstrual and secretory phase of menstrual cycle.

Conclusion: Our findings indicate a higher sympathetic activity and a higher basal heart rate in secretory phase as compared to other phases. Parasympathetic activity on the other hand was higher during proliferative phase. The higher sympathetic activity may be correlated with higher progesterone levels during the secretory phases of menstrual cycle whereas higher parasympathetic activity may be because of oestrogen predominance during proliferative phase. This suggests that the hormonal fluctuations that occur during menstrual cycle may alter autonomic system outflow.

FP/10

Does resting cardiovascular autonomic function affect post-exercise heart rate recovery time? An observational study.

Dr Binit Kumar, Dr Anuj Chawla

Background: Our understanding of post-exercise heart rate (HR) recovery is limited. It is thought to be the result of a complex interaction between the sympathetic and parasympathetic systems, with the early part of HR recovery being a result of parasympathetic reactivation followed subsequently by sympathetic withdrawal. It is likely that this complex interplay of the autonomic nervous system might be influenced by the resting autonomic status of the individual. The present study attempted to explore this phenomenon.

Procedure: Resting cardiovascular Autonomic Nervous System (ANS) function of 75 healthy adult males between ages 18-40 yrs. was evaluated using PC Windows based Cardiac Autonomic Neuropathy analysis system (CANWin®). Subjects then underwent an incremental exercise protocol on a bicycle ergometer, till 85% of Target Heart Rate was achieved. Minute to minute HR recovery was recorded post-exercise, with the subjects seated, till HR reached back to pre-exercise levels. Post-exercise HR recovery time was correlated with resting ANS function.

Results: HR recovery time showed a wide variation amongst subjects with the mean HR recovery time being 55.67±20.16 min. HR recovery time showed weak correlation with Resting HR(r=-0.31, p=0.0068), HR response to standing(r=0.2581, p=0.0254), HR response to Valsalva(r=0.2376,

p=0.0401), HR response to deep breathing(r=-0.08456, p=0.4707), BP response to handgrip(r=0.2368, p=0.0408).

Conclusion: Resting ANS function has a weak correlation with post-exercise HR recovery time. Tests of parasympathetic function appear to have a more significant correlation compared to sympathetic function, suggesting a greater role of the parasympathetic system in this phenomenon.

FP/11

Effect of single bout of deep breathing on Heart rate variability in young healthy individuals

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Introduction: Various measures of Heart rate variability (HRV) during regular deep breathing (DB) practices (e.g. Pranayam) have been shown to respond markedly with increased parasympathetic tone. However, HRV changes during and after short term DB in untrained subjects (as a type of standard parasympathetic challenge during Autonomic function tests) have not yet been very clear.

Objectives: Our objective was to assess the effect of one time deep breathing exercise in healthy males in supine posture.

Material & methods: Resting ECG of healthy males (n=24) was recorded by Power Lab, (AD Instruments Pvt Ltd, USA) in supine posture. Thereafter, they performed DB test (5 sec cycle of inspiration and expiration at a rate 6 breaths/min) for 3-minutes. ECG recording was done during and post DB phase for 5 minutes followed by HRV analysis.

Results: Mean HRV showed significant increase (from 21.4±6.9 to 32.6±10.4; p<0.0001) during DB which stabilized to resting levels during post DB phase. RMSSD and pNN50 significantly increased during DB (from 49.3±18.4 to 56.38±22.5) but decreased significantly (36.5±24.8) in post DB phase. HF was significantly decreased (p<0.05) during DB as well as post DB phase. Whereas, LF (from 39.96±16.64 to 47.14±19.24) and LF/HF ratio (from 0.73±0.49 to 1.28±0.72) significantly increased during post DB phase.

Conclusion: An increased sympathetic tone and sympathovagal balance at post DB phase shows an altered autonomic balance. This is in contrast to the reported parasympathetic dominance in regular DB practioners and might indicate physiological oscillation of autonomic function in response to single bout of a challenge.

FP/12

A COMPARATIVE STUDY OF HEART RATE VARIABILITY BETWEEN NORMOTENSIVE, PREHYPERTENSIVE AND HYPERTENSIVE INDIVIDUALS

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BACKGROUND: Hypertension is one of the leading causes of global burden of disease. Autonomic nervous system plays an important role in blood pressure regulation. Autonomic dysregulation may be the key to etiology, progression & subsequent end organ damage seen in hypertension. Heart Rate Variability (HRV) has superseded classical tests for autonomic function as it quantifies sympathetic and parasympathetic activity.

OBJECTIVES: The present study aimed to compare measures of Heart rate Variability in prehypertensive and newly diagnosed or untreated hypertensive subjects with respect to normotensive individuals.

METHODS AND MATERIALS: The study included 60 newly diagnosed or untreated hypertensive individuals and 60 prehypertensive subjects, of

either sex in age group 18-60 years classified per JNC-VII classification, along with 60 age and sex matched normotensive subjects. A short-term 5-minute ECG recording was taken using Biomed polygraph in accordance with international task force guidelines & HRV analysis done on time domain & frequency domain measures. The observed data was assessed using unpaired student's t- test.

RESULT: The LF/HF ratio was found to be significantly increased in hypertensive as well as prehypertensive subjects ($p<0.05$) suggesting increased sympathetic activity, along with significantly lower HF indicating reduced vagal tone ($p<0.05$). Time domain measures RMSSD and pNN50 were also significantly reduced ($p<0.5$), suggestive of decreased parasympathetic activity.

CONCLUSION: HRV can be used as screening test to predict future risk of hypertension. Since decline in HRV has been associated with adverse cardiac events in healthy as well as diseased individuals both cardiovascular morbidity and mortality can be decreased if modifications and interventions are brought on earlier.

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FP/13

Yoga: a noble way to handle stress and anxiety

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Background: Yoga which is a combination of asana,pranayama and meditation,is gaining interest since last decades as it has been known to improve the quality of life.Upto an extent anxiety is good but excessive anxiety impairs the daily routine activities of life as it is associated with various physical,behavioural and emotional symptoms.Yogic practices aim to promote healthy lifestyle which reduces anxiety.

Aim and objectives-.The present study is aimed to find out the effect of only yogic asanas on anxiety and stress among nursing students.

Material and methods-Thirty female nursing students between 20-30yrs of age were selected randomly. The students practiced yogic asanas for six weeks. The subjects were made to fill Beck anxiety inventory, Zung anxiety scale before and after six weeks of yogic asanas practice.

Results and conclusions-The student paired t test was applied and results showed statistically significant improvement in anxiety scores ($p<0.01$). Thus the study shows that even short term practice of yogic asanas causes improvement in anxiety.

FP/14

Effects of Yoga and Endurance Exercise on some Neurologic functions, A Comparative Study

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Key Words: Swimming, yoga, cold pressor test, hand grip test, auditory reaction time, visual reaction time

The conventional endurance exercises like walking, jogging, running, swimming, etc. are practiced everywhere. Ancient yoga like pranayama, is said to benefit human body on multiple fronts are also getting popular. It is claimed that the regular practice of pranayama increases parasympathetic tone, decreases sympathetic activity. This study was designed to assess the effects of yoga and

swimming on various neurological functions in healthy volunteers.

Aim: To compare the effects of yoga and endurance exercise on major neurological functions in healthy individuals

Material and methods: This Prospective Randomized Controlled study was conducted in Department of Physiology in PG Research Laboratory, J.N.M.C, Sawangi, Wardha on randomly selected 100 healthy males and females between age group of 18-50 years.

The subjects were randomly assigned to undergo either yogic training or swimming for a duration of 12 weeks. Total 80 individuals continued till the end; 40 subjects from each group remained. All study parameters in both the groups (Hand grip test, Cold Pressor Test, ART, VRT) were measured before and after the training for any difference.

Result: Yoga in comparison to swimming reduced systolic blood pressure response to cold pressor test significantly but not diastolic blood pressure. The heart rate response to hand grip test increased significantly in both yoga and swimming group. The average auditory reaction time and visual reaction time reduced significantly in both the groups after training.

Conclusions: Either yoga or swimming can be advocated as an exercise prescription as both the modalities of exercises cause significant improvement of health. However, other factors like cost effectiveness and ability of any exercise regime to keep continued motivation and interest of the trainees must be taken into account for exercise prescription.

FP/15

A study of pulmonary functions in swimmers

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Key words: Pulmonary function test, Swimmers.

Background: Exercise is performing physical activity. Swimming is an aerobic exercise, which improves various functions of our body. Swimming may affect respiratory system that can be measured by various pulmonary function tests.

Aim and objectives: To study and compare some pulmonary functions in male swimmers and male sedentary controls.

Material and methods: This is a cross-sectional study which include 50 male swimmers & 50male healthy sedentary controls in the age group of 18-25 years. Various parameters of pulmonary function test (PFT) were studied in them using computerised spirometer. Unpaired t- test was used to analyse the results.

Results: It showed no significant difference in anthropometric parameters in swimmers and control groups. Various parameters of PFT such as Forced Vital Capacity (FVC) , Forced Expiratory volume in first second (FEV1), Peak expiratory flow rate (PEFR), forced expiratory flow at 25–75% of forced vital capacity (FEF 25-75 %) , Maximum Voluntary Ventilation (MVV) were increased in swimmer as compared to control and differences were statistically highly significant. Whereas ratio of Forced expiratory volume in first second and forced vital capacity (FEV1 /FVC) showed that difference was statistically not significant in swimmers & controls.

Conclusions: We concluded that most of the pulmonary functions were improved in swimmers as compared to sedentary controls. So regular swimming is a good exercise to improve pulmonary functions.

FP/16

Comparison of Improvement in Pulmonary Function Test (Pft) between Montelukast and Formoterol as Add On Therapy in Moderate Persistent Asthma

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Background: Since long asthma control is achieved by minimizing airway inflammation using inhaled corticosteroids and long acting β_2 agonists (LABAs). But efficacy of leukotriene antagonists (LTRAs) as add on is still little explored in moderate persistent asthma patients.

Objective: Study aim was to compare the efficacy between formoterol and montelukast as add-on therapy to inhaled budesonide in moderate persistent asthma using pulmonary function test (Spirometry).

Materials & method: This study was carried out at Department of Pharmacology and TB & Respiratory Medicine, Pt. BDS PGIMS, Rohtak, Haryana. The protocol was approved by institutional review board. Out of 60 OPD patients, group A (30) received inhaled budesonide 400µg and formoterol fumarate 6µg twice daily and group B (30) received oral montelukast 10 mg once daily along with inhaled budesonide 400 µg twice daily. PFT recording FEV_1, FEV_1/FVC and PEFR were considered as efficacy parameters. All PFT values were expressed as mean±SD & comparison between both groups was done using unpaired t-test.

Results: In Group A, FEV_1 at 0 week was (1.91±0.30) & at 8 weeks (2.18± 0.36), FEV_1/FVC improved from (0.70±0.05) to (0.75±0.07) and PEFR from (4.9±0.84) to (5.81±1.23) whereas in Group B, FEV_1 improved from (1.95±0.32) to (2.37±0.91), FEV_1/FVC at 0 week was (0.70±0.06) & (0.76±0.08) at 8 weeks and PEFR from (4.99±0.99) to (5.55±1.11). Baseline PFT Values at 0 week & Improvement at 8 weeks were comparable between both groups with P-value > 0.05.

Conclusion: Montelukast was observed to be as effective as formoterol fumarate. Hence, montelukast as alternate therapeutic option is expected to help physicians in making rational decision when treating patients.

FP/17

Immediate effect of Slow Deep Breathing on different parameters of Pulmonary Function Test in Healthy medical students

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Background: The beneficial effects of Yoga besides its spiritual achievements are now well known in medical fraternity. “Pranayama” is the fourth stage of the ‘Patanjali’s Ashthanga Yoga’ which means the conscious voluntary regulation of breathing. Breathing is the autonomic function that can be controlled voluntarily by which we can achieve a balance between Sympathetic and Parasympathetic activity.

Objective: To find out whether the Slow Deep Breathing has some immediate significant beneficial effect on Pulmonary function test or not.

Materials and Method: After taking necessary permission from the Institutional Ethics Committee thirty one (23 Male and 8 Female) healthy volunteer of age group 18 Years to 24 years were included in the study on the basis of inclusion and exclusion criteria. Recording of Pulmonary Function (PFT) were taken by computerized spirometer before and after performing 10 minutes of Slow Deep Breathing after taking informed consent. The following parameters were taken into consideration

FVC (Forced Vital Capacity), Forced expiratory volume in the first second (FEV1), Peak expiratory flow rate (PEFR), Forced expiratory flow 25-75% (FEF25-75%) and FEV1/FVC ratio.

Results: The recorded data were statistically interpreted by SPSS which showed a Significant increase ($p= \leq 0.05$) in FVC, PEFR, FEF25-75% and FEV1/FVC ratio after breathing exercise.

Conclusion: There is statistically significant increase in almost all of the Lung function parameter. This breathing exercise can be performed on regular basis to improve the lung functions which may have some medical significance in treating different lung diseases as a sole or adjunct therapy.

FP/18

CORRELATION OF FORCED EXPIRATORY TIME WITH ANTHROPOMETRIC AND SPIROMETRIC INDICES, A RETROSPECTIVE STUDY

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BACKGROUND: Forced expiratory time (FET) signifies duration of forced expiration during spirometry. Joint recommendation of the American Thoracic Society (ATS) and the European Respiratory Society (ERS) have expressed new interest about FET in their latest guidelines (2005).Interpretation of FET in respect to spirometric and anthropometric determinants in our population is yet to be established. The aim of this study was to evaluate the correlation of FET with anthropometric and spirometric indices in subjects with normal spirometry.

METHODS: A retrospective study was conducted based on spirometry results obtained between February and July 2016 from the saved database at pulmonary function laboratory of department of Physiology, R G Kar Medical College, Kolkata. Age, sex and body mass index (BMI) matched 220 subjects were selected for analysis who underwent spirometry for the first time by HELIOS 702 spirometer as per ATS/ERS protocol and using 80% ethnic correction. Percent predicted values of FEV_1/FVC and PEFR along with FET (seconds) were collected. Statistical analysis was done using two sample Z-test and Pearson's correlation coefficient.

RESULTS: FET in the study population was 2.872±0.903s [male (3.189±0.922s), female (2.555±0.766s), p value <0.0001].FEV_1/FVC showed strong negative correlation (r:−0.639) and PEFR showed weakly negative correlation (r:−0.285) with FET while both age and BMI were correlated positively [(r:+0.445) and (r:+0.239) respectively].

CONCLUSION: Mean FET is around 3 seconds in the study population with gender variance. The negative correlation of FET with FEV_1/FVC along with PEFR may suggests airflow limitation. FET increases with age suggesting age related alteration in pulmonary mechanics and positive correlation with BMI denotes FET as an indicator of pulmonary efficiency in obese.

FP/19

Emmetropization: insight from studies on animals.

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Background: Emmetropization is the process that produces emmetropic eyes more frequently than would be expected otherwise. Such a process would coordinate the development of the various components like axial length, refracting power and depth of the anterior chamber among others. The process is not referred to in the textbooks as it is not fully understood.

Objectives: To link the deductions from the reported animal experimentation on emmetropization and to find the gaps in the knowledge.

Material and methods: Deductions of various emmetropization related animal experiments gathered by reviewing the literature were analyzed and used to construct the possible sequence of steps involved.

Results: Marmoset monkey, tree shrew and chick emerged in seventies as primary models for research in the process of emmetropization. Role of visual environment has been investigated by manipulating the refractive state of growing eye by two techniques: visual form deprivation & imposition of defocussing lenses. Roles of retina, accommodation & intraocular pressure have also been investigated. There is evidence that the process continues, at least to some extent, even in adults.

Conclusion: Emmetropization involves visual environment induced signals from retina modulating the thickness of the choroid, further resulting in changes in sclera that alter the ocular length. Though there is evidence of participation of various molecules, the signal cascade has not yet been fully elucidated. It seems it is a well guided process in young animals and continues in adults as a homeostatic process guided by the requirements. Better understanding may be useful in dealing with ametropia.

FP/20

Relationship of parasympathetic nervous system functions of cardiac activity on Body mass index of healthy young adults

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Keywords: BMI, PNS, Valsalva ratio.

Background: Body Mass Index (BMI) is the marker for body fat content. It has been used to identify and classify individuals who are most likely to be overweight or obese. Increase in BMI ($\geq$25kg/m^2) is not only risk factor for Cardiac disorders but also altered autonomic functions.

Objectives: 1. to study Parasympathetic nervous system (PNS) functions in study subjects between two groups. 2. To assess relationship between BMI and Parasympathetic functions.

Material and Methods: After obtaining institutional ethical clearance, 100 healthy subjects aged between 18-40 years were selected and categorized in two groups. First group with BMI <25kg/m^2 and second group with BMI $\geq$25kg/m^2 consisting of fifty subjects in each group. Valsalva ratio, Heart rate (HR) response to deep breathing and standing were recorded using Lead II ECG.

Results: In comparison with Group I, Group II subjects showed statistically significant increase in the Weight, BMI and Body Surface Area (BSA), whereas resting heart rate in Group II subjects was statistically not significant. Parasympathetic functions where significantly reduced in Group II subjects as compared to group I. We observed there was a negative correlation between BMI & PNS functions in group II.

Conclusion: Increase in BMI is associated with altered cardiac parasympathetic functions which can cause far-reaching adverse effects in near future, including metabolic syndrome and cardiovascular malfunction. So having a constant check on BMI helps in preventing PNS abnormalities.

FP/21

RET gene mutation is not associated with morphological and motility changes of majority of Hirschsprung's colon.

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Key words: Hirschsprung's disease, Acetyl cholinesterase, Carbachol, Endothelin-1.

Background: The role of RET gene mutation in morphological and motility changes in Hirschsprung's colon is not clear. Therefore, the present study was undertaken to evaluate the contribution of RET gene in morphological and contractile status in colon with Hirschsprung's disease.

Methods: In 23 cases of Hirschsprung's disease RET gene mutation was assessed by DNA sequencing, with the help of ABI Big Dye Terminator cycle sequencing kit. Sequence of exons of RET were analyzed by Clustal X and Mega 6 software and mutated sequences were analyzed through Polyphen2 and Mutation tester. Morphological changes was assessed by staining of tissue with Haematoxylin & Eosin (H&E) and Acetyl cholinesterase (AChE) and contractile function of colonic smooth muscle was evaluated by *in vitro* recording of contraction in an organ bath with the help of isometric transducer (MLT 0210) and data acquisition system.

Results: The present study demonstrated RET gene mutation in only 02 out of 23 (9%) cases of HD. In all cases histopathologcal examination revealed absence of ganglion cells, hypertrophied nerve bundle in submucosa and other neural abnormalities in H&E and AChE staining. A positive AChE staining confirmed HD. Contractile function of these cases also lacked the spontaneous contraction *in vitro,* but muscle strips responded to agonists like carbachol and endothelin.

Conclusion: RET gene mutation may not be associated with histopathological and contractile impairment in majority of Hirschsprung's cases.

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FP/22

Effect of Maternal Factors on Umbilical Cord Blood Haematological Parameters

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Background: Haematological values of newborns depend on several factors, including ethnic group, maternal health, nutritional status and maternal anaemia.

Objectives: To observe effect of maternal factors on haematological parameters of umbilical cord blood.

Material and methods: Cross-sectional study was conducted on 220 term pregnant women aged 18-45years with their newborns(M=117,F=103)N weighing 2.5-4kg, in Department of Physiology in collaboration with Department of Obstetrics and Gynaecology at Regional Institute of Medical Sciences (RIMS), from August 2014 to July 2016. Maternal blood samples were collected from the pregnant mothers during the first stage of labour. Cord blood was collected immediately after expulsion of placenta.

Results: There was no significant (p= 0.117) relation between maternal age and birth weight of newborn. Cord blood haemoglobin, RBC count and HCT were significantly lower in newborns of mothers aged >30 years as compared to mothers aged ≤ 30 years. Cord blood Hb was significantly (P= 0.029) lower in newborns of anaemic mothers as compared to non-anaemic mothers. Birth weight of newborn was significantly (P = 0.023) higher in newborns of multigravida mothers as compared to primigravida mothers. Cord blood Hb, RBC count, HCT, MCV and RDWc were significantly lower in

newborns of multigravida mothers as compared to primigravida mothers.

Conclusions: Cord blood parameters were affected by maternal age and multigravity.

FP/23

"Assessment of Anaemia among and its Predictors among Pregnant Women attending Antenatal Outpatient Department of Obstetrics and Gynaecology at Central Referral Hospital, Gangtok"

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Keywords: Prevalence, Anaemia, Pregnant women

Objective: To study the prevalence of Anaemia and its Predictors among Pregnant women attending Antenatal outpatient Department of obstetrics and Gynaecology at Central Referral Hospital, Gangtok, Sikkim. **Design:** A hospital based cross sectional studies conducted in the year Jan 2015-Jan 2016.

Materials and Methods: A face-to-face interview using structured pretested questionnaire was employed to obtain details of the present pregnancy including medical conditions if any present on 250 patients. Assessment of anaemia was done by checking the haemoglobin levels. Using WHO criteria Anaemia was define as mild (Hb ≤ 11gm/dl), moderate (Hb between 7-9gm/dl) and severe anaemia (Hb ≤ 7gm/dl).

Results: Among the 250 pregnant women, 25 of them was suffering from mild anaemia (10%) and 9 of them was suffering from moderate anaemia (3.6%).Prevalence was more among Hindus and lowest in Buddhist.

Conclusion: The overall prevalence of anaemia is significantly low accounting to only 13.6% as compared to others studies conducted elsewhere in India which may be due to dietary habit of the population as well as Central Referral Hospital, Gangtok being a private hospital, middle class and upper middle class frequent more except for the few referred case from the periphery. However population based cross sectional study with larger sample size may be required.

FP/24

Electrophysiological studies on phosphorylation of purified Voltage Dependent Anion Channel by c-Jun N-terminal Kinase-3 on artificial bilayer lipid membranes

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Background: In biological systems phosphorylation controls the opening-closing process of an ion channel. Effect of phosphorylation by different kinases on these process is different due to different kinase sites. This effect is usually studied by two ways: One way is to phosphorylate the ion channel in vitro and then incorporate it into the artificial planar lipid membranes and note the open-time and current passing it at different applied voltages. The other way is to first incorporate the ion channel into the membrane and then carry out the phosphorylation reaction. In this work we have studied the phosphorylation of rat brain outer mitochondrial membrane voltage dependent anion channel (VDAC) by c-Jun N-terminal Kinase-3 (JNK3) by the two ways.

Methods: 1. VDAC phosphorylation was checked in gel [1]. 2. Then effect on VDAC opening-closing and current passing through it was checked [1].

Results and Conclusions:

1. VDAC is phosphorylated by JNK3.

2. Phosphorylation after incorporation on membrane leads to significant decrease in channel current suggesting its closure [1]. It has been already proposed that VDAC closure might lead to apoptosis as VDAC controls ion and metabolite transport from the mitochondria to the cytosol.
3. Phosphorylation before incorporation lead to increase in opening at negative voltages but at positive voltages it remained unchanged. This suggests different closure mechanisms operate at positive and negative voltages. Thus, this study helped in understanding the VDAC structure-function relationship.

FP/25

A Study on the Effect of Selenium Supplementation to Pregnant Mothers on Baby Birth Weight

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BACKGROUND: The trace element selenium is considered to be an essential element for neonatal health[1]. However, the poor malnourished Indian mothers often deliver low birth weight babies. Selenium is a potent antioxidant. It also activates the enzyme deiodinase which converts T4 to T3. Therefore is our study.

OBJECTIVES: To study the effect of selenium supplementation to pregnant mothers on baby birth weight.

MATERIALS & METHODS: 30 pregnant mothers were selected from the obstetrics OPD as test subjects and were given 100 µg every day throughout pregnancy. Another 30 were given placebo and were treated as controls. After delivery, the babies-birth weights in each category were taken and statistical analysis was done to control the two groups.

RESULTS & DISCUSSION: The result showed that the mean baby birth weight in the test group (those who received selenium tablets during pregnancy) was 2.27 ± 0.55 kg, compared to the control group (those who received placebo during pregnancy) which was 2.85 ± 0.39 kg. This difference was statistically significant ($P<0.05$) proving that selenium supplementation in pregnant mothers increases baby birth weight at least in our conditions.

CONCLUSION: This study shows that selenium supplementation in pregnant mother's increases baby birth weight at least in our conditions. However more rigorous studies with broader background preferably multicentric are required to incorporate this practice in general population.

FP/26

Comparison between serum Calcium levels in elderly males and females in Jharkhand

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BACKGROUND: Calcium ions play a vital role in the normal physiological processes in the human body.Serum calcium levels in an average elderly person is in negative balance. A growing evidence suggests that inadequate calcium intake in the elderly may contribute to this. Decreased calcium levels in ageing populations is a concern especially in females.

AIMS AND OBJECTIVES: The present study is a comparison between serum calcium levels in elderly males and females of Jharkhand.

MATERIALS AND METHODS: 50 elderly females and males (>50 years) of age from OPD, RIMS, Ranchi. Estimation was done using Arsenazo III method based on colorimetery.

RESULT: Above 50 years serum calcium levels were lower than normal range more so in females as

compared to males. However this difference was less marked in cases over 70 years of age.

CONCLUSION: Serum calcium level estimation can significantly help in early detection of its deficiency and prompt treatment will prevent complications especially in elderly females and males.

FP/27

Level of Vitamin D3 in pre and post Menopausal Tribal females of Jharkhand

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BACKGROUND: Vitamin D is an essential vitamin required by the body for the absorption of calcium, bone development, immune functioning, and alleviation of inflammation. Vitamin D deficiency can lead to rickets, a weakened immune system, increased cancer risk, poor hair growth, and osteoporosis. Vitamin d plays a vital role for menopausal women in particular, those over 50.Vitamin D inadequacy has been studied extensively due to concerns about ageing populations, associated with osteoporosis and other disorders.

AIMS AND OBJECTIVES: To compare the level of Vitamin D3 in pre and post menopausal tribal women of Jharkhand.

MATERIAL AND METHODS: CASE: 50 elderly menopausal women were selected from OPD of RIMS RANCHI. CONTROL: 50 females who are of premenopausal age group from OPD of RIMS RANCHI. Estimation of Vitamin D3 was done by ELISA method.

RESULTS: Menopausal women contain less serum Vitamin D3 compared to premenopausal women.

CONCLUSION: Vitamin D3 estimation in post menopausal may significantly help in early detection of its deficiency and prompt treatment will reduce occurrence of disease.

FP/28

Effect of low protein diet on diabetic nephropathy in patients of type 2 Diabetes Mellitus: An assessment by 24 hour urinary protein

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Keywords: Diabetes Mellitus, Nephropathy, Proteinuria, 24 hour urinary protein.

Background: The prevalence of Diabetes is on the rise, more alarming in the developing countries, like India. Gradually and eventually it culminates into multisystem involvement. Diabetic nephropathy occurs in as many as 30% of insulin dependent Diabetes Mellitus patients and 25% of non-insulin dependent Diabetes Mellitus patients.

Aims and objectives: The present study aims to assess the effect of low protein diet on diabetic nephropathy in patients of type 2 Diabetes Mellitus and to quantify and compare the results on the basis of 24 hour urinary protein measurement.

Materials and methods: This study was conducted in the Department of Physiology, RIMS, Ranchi on randomly selected 50 patients of type 2 Diabetes Mellitus patients having macroproteinuria (24 hour urinary protein > 300 mg). They were further grouped into two, one group members (n = 24) were advised to take low protein diet and another group members (n = 26) were not given any instruction to follow any specific dietary plan and they were taken as controls. After two months their 24 hour urinary protein was measured to assess the magnitude of diabetic nephropathy.

Results: The mean values of 24 hour urinary protein in group 1 subjects before and after the intervention were 444.83 mg and 312.00 mg respectively and the mean values of that in group 2 subjects before and after the study period were 448.50 mg and 437.50 mg.

Conclusion: The subjects who were advised to take low protein diet shown more decrease in mean value of 24 hour urinary protein than the control group showing some protective effect on progression of diabetic nephropathy.

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FP/29

Prescription trends in Acne Vulgaris patients visiting Dermatology OPD in Tertiary care Rural Hospital – A Cross Sectional study

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Key words: Acne Vulgaris, Prescription trend, Dermatology, Topical, Polytherapy

Background: Acne Vulgaris is a very common skin disease of teenagers (prevalence 85-90%). It may cause permanent disfigurement of face and results in Depression. Effective treatment in acne is important, but prescription pattern varies in different regions, urban and rural setup. So, this study is done to know the current prescription trend in acne treatment in rural hospital focusing on use of Topical, Oral drugs and polytherapy versus monotherapy.

Methods: This Cross Sectional study was conducted for a period of 3 months from February 2016 – April 2016, on patients more than 10 years of age visited the Dermatology OPD of the Rural Hospital, after getting approval from the Institutional Ethical Committee. Drug induced acne were excluded.

Results: Total 50 prescriptions were analysed. Male and Female ratio was 2:1. Total 100 numbers of drugs were prescribed. Out of this 100 drugs topical drugs was 63(63%) and Oral drugs was 37(37%). Topical drugs used were Benzoyl peroxide in 25(39.68%), Clindamycin in 15(23.8%), Adapalene in 17(26.98%), Tretinoin in 6(9.52%) patients. Oral drugs used were Doxycycline in 29(78.38%), Azithromycin in 5(13.51%), and Isotretinoin in 3(8.11%) patients. Patients received polytherapy were 46(92%) and monotherapy 4(8%).

Conclusion: Male preponderance was found among the Acne Vulgaris patients in this Rural Hospital. Topical drugs were mostly used in treatment of acne as compared to oral. Most preferred Topical drug was Benzyl peroxide and oral drug was Doxycycline. Polytherapy was widely preferred over monotherapy in this Rural Hospital.

FP/30

Transdermal patch: A comprehensive evaluation of newer drug delivery system in modern medical science

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Keywords: Drugs, Transdermal patch, Bioavailability

Background: Oral route of drug administration has been the most common route of drug administration since the beginning of the therapeutic area in medical science. However this route of drug administration fails at bypassing the first pass metabolism of the drug in liver with poor bio availability. Oral route of drug administration also fails in uncooperative /unconscious semiconscious / pediatric subjects.

Transdermal patch, a new drug delivery system through skin to the parenteral circulation has been the most recently discussed topic in pharmacology and medicine as it is a noninvasive route of drug administration, delivered in a sustained / pre fixed dosage with no / extremely less first pass metabolism and better **bio availability**. Most importantly it can be used in semiconscious / unconscious & pediatric subjects without affecting their hemodynamics.

Conclusion: The transdermal patches have many beneficial factors however they also come with some major drawbacks like varieties of formulation, design and quality of adhesiveness. This articles provides an insight of transdermal patch in terms of its mechanism of action, advantages, disadvantages and future scope of it in the medical science.

FP/31

Acute and chronic exposure to Bisphenol A attenuates Phenylbiguanide reflex response in anaesthetized rats

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Background: Bisphenol A (BPA) is used in the manufacturing of plastics. BPA is an estrogenic compound and is associated with reproductive and endocrinal abnormalities in various studies.

Objectives: BPA has been earlier reported to produce decrease in rate and force of atrial contractions *in vitro* in rats. Therefore the present study was taken up to examine its effects on cardiovascular system *in vivo* in rats.

Methods: Acute experiments were performed on adult female rats of Charles Foster strain. The experiments were divided into 2 groups. In group 1 (n =8), the animals were anaesthetized with urethane (1.5 gm/kg body weight; intraperitoneal) and prepared for recording blood pressure, ECG and respiratory excursions. After stabilization, PBG (10 µg/kg body weight) was injected through jugular vein to evoke reflexes in these animals. Thereafter, the PBG reflexes were obtained after 30 min of injecting BPA (35mg/kg body weight; i.v.). Similarly, in group 2 (control group, n =7), PBG reflexes were obtained after injecting equi-volumes of ethanol as used to prepare BPA solution. To study the effect of chronic exposure of BPA, the animals were ingested pellets with BPA (2 µg/kg body weight/day) and normal food (time-matched control) for 30 days. Thereafter, the animals were anaesthetized with urethane and PBG reflex response was obtained in a method similar to acute experiments.

Results: Both acute and chronic exposure of animals to BPA attenuated the PBG-induced responses significantly whereas there was no change in response in control group.

Conclusion: Hence, BPA attenuates the cardio-protective reflexes and produces cardiovascular toxicity.

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FP/32

Analysis of heart rate variability in preeclampsia

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Background: Autonomic nervous system plays a central role in mediating the adaptive changes in

the maternal hemodynamics during pregnancy. Many of the previous reports have suggested impairment of autonomic functions as one of the main causes of preeclampsia. However, it is still a debate whether preeclamptic pregnancy is associated with disturbance in the sympathetic and/or parasympathetic functions.

Methods: A total of 80 young women were enrolled in this study: 40 women with preeclampsia and 40 normotensive pregnant women matched with the preeclampsia group for age, week of gestation, and body weight. All subjects were recruited from outpatient department of Obstetrics and Gynecology of VMMC & Safdarjung Hospital, Delhi. Assessment of heart rate variability (HRV) was done by recording electrocardiogram (ECG) for 5 min in the daytime, with each subject lying quietly and breathing normally. Both time and frequency domain parameters of heart rate variability were determined. Statistical analysis was done using Mann- Whitney U test.

Results: Preeclamptic patients showed significantly higher heart rate compared to normotensive pregnant females. There was a significant decrease in SDNN, RMSSD, Total power, LF and HF values and increase in LF to HF ratio in females with preeclampsia compared to normotensive pregnant females.

Conclusion: Our results demonstrate significant autonomic dysregulation in preeclampsia, as shown by reduction of both sympathetic and parasympathetic tone. Higher LF to HF ratio in preeclamptic group reflects impaired sympathovagal balance with a reduced vagal modulation.

FP/33

STUDY OF HEART RATE VARIABILITY IN PATIENTS OF MYOCARDIAL INFARCTION WITH AND WITHOUT TYPE 2 DIABETES MELLITUS

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Background: Diabetes mellitus (DM) is a strong risk factor for cardiovascular disorders. Diabetic subjects are more likely to experience a myocardial infarction (MI) and have worse outcomes compared to non-diabetics. Despite a close association of diabetes with MI, only few studies have attempted to see the impact of diabetes on autonomic functions of MI patients and the results are contradictory.

Objective: To study the impact of Type 2 DM on cardiac autonomic functions in patients of MI .

Methods: The study included 18 patients of first MI of either sex and in the age range of 45-65 years with or without previous history of type 2 DM selected from cardiology outpatient department of Safdarjung Hospital. Patients on the basis of their previous history were divided into two groups:

Group I (n=8) - Patients with MI with previous history of Type 2 DM

Group II (n=10) - Patients with MI without previous history of Type 2 DM

The cardiac autonomic functions were assessed by measuring short term heart rate variability. Both time and frequency domain measures of HRV were calculated from 5 minute electrocardiogram recordings.

Result: Patients of MI with type 2 DM showed a significant decrease in SDNN , pNN50 , Total Power, VLF and LF compared to non diabetic group.

Conclusions: Heart Rate Variability is attenuated in patients of MI with type 2 DM. This reflects that presence of diabetes in MI patients results in greater worsening of cardiac autonomic functions.

FP/34

EFFECT OF SUBCLINICAL HYPOTHYROIDISM ON ELECTROPHYSIOLOGICAL PARAMETERS OF PERIPHERAL NERVE

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Background: Subclinical hypothyroidism represents mild thyroid failure is an oligosymptomatic or asymptomatic condition with elevated serum TSH (>5µIU/mL) with concomitant normal serum free thyroxin (T4) and triiodothyronine (T3) concentrations. It is the most prevalent thyroid disorder affecting 3-15% of the adult population with higher incidence in female. Oftenly reported having dry skin, muscle weakness, fatigue, muscle cramps, weight gain, menorrhagia (female patients). Most of the neuropathy remains latent in the early phase of disorder. This latent subclinical neuropathy can be investigated using Electroneuromyogram.

Objectives: The present study was planned to observe any changes in electrophysiological parameters of sensory and motor component of median and ulnar nerves of both limbs in subclinical hypothyroidism patients.

Methods: The study was conducted on 120 subjects aged 18-45 years old, out of which 60 cases of biochemically diagnosed subclinical hypothyroidism and 60 healthy age and sex matched controls were taken. Electrophysiological parameters of MNCV (Motor nerve conduction velocity) and SNCV (Sensory nerve conduction velocity) of Median and Ulnar nerve was performed in both limbs in cases and controls by using Medicaid Neurostim Equipment according to international guidelines. Data was statistically analyzed by unpaired t-test using graph pad prism software.

Results: There is significant increase in the latency of sensory(p value 0.02) and motor (p value 0.014) component of right and left median nerve and significant decrease in amplitude(p value 0.03) of sensory component of right median nerve as well as Significant decrease in SNCV (p value 0.03) (both arm) and MNCV (p value 0.0001) (left arm) . Increase in latency (p value 0.02) of both sensory and motor part and decrease in amplitude(p value 0.01) of motor part, SNCV(p value 0.0009) of right and left ulnar nerve. Conclusion: Even before emergence of neurological symptoms in patients with subclinical Hypothyroidism abnormalities can be detected in Nerve Conduction Studies; which may contribute to early diagnosis and treatment.

FP/35

Nitric oxide inhibits meiotic resumption from diplotene arrest in rat cumulus oocytes complexes cultured *in vitro*

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Keywords: Diplotene arrest; Nitric oxide; cAMP; MPF; Meiotic resumption

Nitric oxide (NO) acts as one of the major signal molecules and modulates cellular physiology including meiotic cell cycle regulation in wide variety of cells. However, role of NO during meiotic cell cycle regulation in follicular oocytes remains poorly understood. Hence, we aimed to investigate the role of NO during spontaneous resumption of arrested cumulus oocytes -meiosis in diplotene (COCs)complexes cultured *in vitro*. For this purpose, diplotene-arrested COCs were collected from ovary of immature female rats after 20 IU pregnant mare's serum gonadotropins (PMSG) for 48 h and *in vitro* effects of *S*-nitroso-*N*-acetyl penicillamine (SNAP; an NO donor), intracellular

NO, cyclic adenosine monophosphate (cAMP), Cdc25B, specific changes in phosphorylation status of cyclin-dependent kinase 1 (Cdk1) and cyclin B1 levels were analyzed. The SNAP inhibited spontaneous meiotic resumption from diplotene arrest in a concentration-dependent manner. The intracellular NO and cAMP level were significantly decreased during meiotic resumption from diplotene arrest. The reduction of Cdc25B expression level was associated with the accumulation of Thr14/Tyr15 phosphorylated Cdk1 level. However, Thr161 phosphorylated Cdk1 as well as cyclin B1 levels were reduced significantly leading to maturation promoting factor (MPF) destabilization. The destabilized MPF finally induced meiotic resumption from diplotene arrest in rat COCs cultured *in vitro*. Taken together, these results suggest that NO plays an important role in meiotic cell cycle regulation of follicular oocytes and that the SNAP could be used to inhibit spontaneous meiotic resumption under *in vitro* culture conditions.

FP/36

Increased Telomerase Reverse Transcriptase Expression Associates with Spontaneous Exit from M-II Arrest in Rat Eggs

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Key words: Apoptosis; Bcl2; Postovulatory egg aging; SEA; TERT; DNA fragmentation

In mammals, postovulatory egg aging deteriorates egg quality possibly by mediating spontaneous exit from metaphase-II (M-II) arrest and/or inducing apoptosis. To test this possibility, present study was designed to investigate telomerase reverse transcriptase (TERT) expression, Bcl2 expression and deoxyribonucleic acid (DNA) fragmentation during postovulatory egg aging *in vivo* as well as *in vitro.* Results suggest that postovulatory egg aging-induced a time-dependent increase in the number of eggs undergoing spontaneous exit from M-II arrest *in vivo* as well as *in vitro*. However, rate of spontaneous exit from M-II arrest was high in eggs cultured *in vitro* as compare to *in vivo* aging. A time-dependent increase of TERT expression was associated with postovulatory aging-mediated spontaneous exit from M-II arrest *in vivo* as well as *in vitro.* The Bcl2 level did not reduce and DNA fragmentation was not detected until 7 h of *in vivo* as well as *in vitro* postovulatory egg aging. Taken together these data suggest that the eggs undergo postovulatory aging as evidenced by increased TERT expression without having any decrease of Bcl2 level or increase of DNA fragmentation until 7 h of *in vivo* as well as *in vitro* egg aging. Thus, ovulated eggs must be used for various ART programs including in vitro fertilization within 7 h of postovulatory aging.

Fp/37

Extent of Antibacterial Compounds Disposition into Aquifers: An Emerging Concern

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Background: Percolating bioactive compounds from the drains and flowing rivers into aquifers are of increasing concern in the emergence of residual drugs effects causing drug resistance, changing soil microbiota, an increase in bioactive organic impurities in potable drinking water.

Objective: This study was conducted to evaluate the disposition of antibacterial agents in surface and aquifers in Delhi and NCR region.

Method: This study quantified antimicrobial agents such as amoxicillin, azithromycin, erythromycin, ciprofloxacin, moxifloxacin, norfloxacin, ofloxacin, sparfloxacin and aminoglycosides (amikacin, kanamycin, gentamicin, neomycin, netilmicin, streptomycin) in the surface water (river) and aquifer water collected from borewells in and

around Delhi. Water sample of 500ml were collected in glass bottles from 13 surface 36 subsurface water from bore-wells of various depth from 70-120 feets. Water samples of 10ml were lyophilized to increase the analytical sensitivity. All samples were subjected for quantification using liquid chromatography coupled ESI tandem mass spectroscopy after validating their methods.

Results: The results of this study revealed that aquifers are significantly affected at several areas indicating the percolation of contents of surface water into the deaths. At selected locations the concentrations of some of these antimicrobial agents were multiple times higher as compared to other areas indicating the requirement to probe the reason behind it. This data further revealed that thickly populated and industrial pockets of Delhi & NCR were found to have higher levels of antimicrobial agents.

Conclusion: For the first time this study shows the infiltration of antibacterial agents into aquifers which is a matter of serious concern for safe drinking water.

Poster Presentations

1PP

Comparison of Ulnar, median and radial nerve F wave in chronic traumatic brachial plexus injury

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Introduction: Brachial plexus injury results in lifelong incapacitation of patients. Most common causes are birth trauma and motor vehicle accidents. Radiological investigations have limitations in telling the functionality of injured nerves especially in closed injuries. Electrophysiological investigations are now gradually replacing the radiological and other invasive diagnostic procedures for this purpose. F wave has emerged as an invaluable investigation for evaluation of brachial plexus injuries.

Method: 30 patients with traumatic injury of brachial plexus of >3 months duration were selected irrespective of gender. They were diagnosed clinically and radiologically. F wave for ulnar, median and radial nerve was recorded on both the upper limbs on RMS EMG EP Mark II machine manufactured by Recorders and Medicare Systems, Chandigarh, India in an isolated room with controlled environmental conditions. For ulnar nerve, Abductor digiti minimi, for median nerve, Abductor pollicis brevis and for radial nerve Extensor indicis proprius muscle was selected. Conventional supramaximal stimulation (25% above maximal) at a rate of not more than 0.5 Hz was used. Recording electrode was placed in a belly tendon montage similar to motor nerve conduction study. For analysis 10 F waves were recorded. The same procedure was done on the non affected limb as control.

Result: The F wave showed consistent and significant change in radial nerve in affected limb as compared to non affected limb. The F mean, min and max and F- M latency showed significant change in radial nerve whereas F_{min} and F-M latency was significant in median nerve. No parameter showed significant change in ulnar nerve.

Conclusion: The result of this study indicates that trauma to brachial plexus might have involved radial nerve more than other two nerves which is consistent with the findings. F wave study of radial nerve can be used for better evaluation of the brachial plexus injury.

2 PP

THE INFLUENCE OF GAMING ON COGNITIVE PERFORMANCE

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Background: Event Related Potential (ERP) refers to patterns of voltage change that occur in ongoing neural activity in response to a stimulus. The use of Reaction times (RTs) & P300 component of ERP provides a neuro-electrical correlate of assessing alterations in higher cerebral function. Gaming has been found to influence aspects of neuro-cognitive performance & alertness. However, very limited studies have been done on the effects of gaming on neuroelectrical correlates of cognition.

Objectives: The present study was conducted with the aim to assess the cognitive performance in action & strategy gamers using P300 & RTs and compare the results so obtained.

Materials and Methods: 92 healthy young adults who played digital games for > 3 hrs/week for at least 3 months duration were recruited in the study and were equally divided into two groups. Group 1 -(action gamers). Group 2 -(strategy gamers). Auditory reaction time (ART), visual reaction time (VRT) and P300 were recorded and compared between action gamers & strategy gamers.

Results: The mean ART and VRT (in msecs) were more in the strategy gamers (317.00±94.79, 299.20±104.64) as compared to the action gamers (293.00±114.93, 237.80±76.38) respectively. However, there was a statistically significant difference (p =0.001) only in the mean VRT of the subjects between two study groups. There was no significant difference in the mean P300 latencies & amplitudes of the subjects in the two study groups.

Conclusion: Cognitive performance of action gamers seemed to be better as compared to strategy gamers as reflected by our Reaction Times & P300 data.

3 PP

BRAINSTEM AUDITORY EVOKED POTENTIALS IN PATIENTS WITH CSOM

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KEYWORDS: Brainstem auditory evoked potentials, Pure Tone Audiometry, Chronic suppurative otitis media, Conductive deafness.

BACKGROUND: Chronic suppurative otitis media is an inflammatory condition and occurs due to an initial episode of acute otitis media and is characterized by a persistent discharge from the middle ear through the perforated ear drum. Diseases affecting the outer or middle ear can cause conductive deafness. We can prevent the hearing loss. Most approaches to treatment have been unsatisfactory, because the developmental stages have not been observed. Prevalence surveys, estimate the global burden of illness from CSOM may involve 65 to 330million individuals with draining ears. According to WHO, the prevalence of CSOM was highest in India.

AIM: To assess the auditory brain stem responses in the diagnosis of conductive deafness .To compare the hearing assessment with pure tone audiometry. MATERIALS AND METHODS: 30 subjects both gender between 18 - 40 years of having conductive deafness with CSOM were included. After the IEC approval, Informed and written consent of the subjects were obtained. Under strict aseptic precautions BAEP recorded. RESULTS: BAEP reveals the wave morphology was good and the appearance of waves are slightly elevated depending upon the frequencies. The interpeak latencies are very high indicating conductive deafness. PTA results showed mild to moderate conductive deafness. Results were statistically analysed using suitable SPSS package.

CONCLUSIONS: BAEP can be used as the diagnostic tool for conductive deafness, and also for earlier identification of the patients and to prevent the progression to sensory neutral deafness due to cochlear pathology, a complication of CSOM.

4 PP

Effect of Electromagnetic waves emitted from mobile phone on psychomotor performance in human adult

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BACKGROUND: Rapid rise of use of mobile phone (MP) has raised the concern of possible health effects of electromagnetic waves (EMW) emitted from it on various body functions .The effect of EMW on psychomotor performance is not clear yet.

OBJECTIVE: Study was planned to investigate the acute effects of EMW from mobile phone on psychomotor performance.

MATERIAL AND METHODS: Study was conducted on 40 subjects in the age group 18-40 years in both sexes (20 male and 20 females) with MP exposure of 30 mins-1hour/day for last 5 years or more. Subjects with history of pulmonary, cardiovascular, hepatic, neurological or ear diseases, medication and fracture of upper arm were excluded. Single letter cancellation test (SLCT), playing card test (PCT), six letter cancellation test (SixLCT), Digit letter substitution test (DLST) were performed before and after mobile phone exposure (GSM 900) for 10 mins. Statistical analysis was done by paired't' test using SPSS 20.

RESULTS: The mean age of subjects was 26 ± 6.02 years, mean per day exposure was 58.23± 17.37 mins. SLCT time (p value= .001), SLCT score (p value=.039), PCT score (p value=.006) were reduced and DLST score was increased (p value = .001) with insignificant effect on SixLCT score after exposure to mobile phone.

CONCLUSION: EMW emitted from mobile phone affects the psychomotor performance even in young human adults.

05PP

A NOVEL COMPUTER BASED TEST TO MEASURE UNIMODAL AND BIMODAL AUDITORY-VISUAL REACTION TIMES – A PILOT STUDY.

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OBJECTIVES: Design a computerized test to determine uni-modal and bimodal auditory-visual reaction times and to do a pilot study.

MATERIALS AND METHODS: 31 subjects, 16 males and 15 females, in the age group of 18 to 20 years took part in the pilot study. A novel computerized test designed using EXCEL sheet and visual basic code was used to measure reaction times. Both audio and visual stimuli were 66 milliseconds long. Simple auditory and visual reaction times were first recorded. 75 bimodal stimuli were then presented and reaction times recorded. Three variations of bimodal stimuli were presented randomly. The variations were- Synchronous Auditory-Visual, Asynchronous Auditory preceding Visual and Asynchronous Visual preceding Auditory. Stimulus onset asynchrony (SOA) in bimodal stimuli ranged between 0 and 500 milliseconds and Interstimulus interval (ISI) between bimodal stimuli ranged between 4.5 and 6 seconds, randomly.

RESULTS: In both male and female subjects, there is approximately 50 millisecond reduction in reaction times to asynchronous bimodal auditory preceding visual stimuli with SOA of 100 milliseconds.

CONCLUSIONS: This novel test offers a means to measure audio visual reaction times. The pilot study suggests that asynchronous bimodal auditory preceding visual stimuli with SOA of 100 milliseconds elicit quicker motor responses.

06PP

Study of relationship between body mass index and audiovisual reaction time in adolescent females of 17-19 years

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Background: Various neurophysiological studies suggest a relationship of BMI with the cognition, attention and the memory. The reaction time is the time interval between the stimulus application and the proper response. The measurement of auditory (ART) and visual reaction time (VRT) has been used to evaluate the processing speed of central nervous system and co-ordination between the sensory and motor system.

Objectives: The present study was aimed to look for any association between the BMI and the audiovisual reaction time in adolescent females.

Material and methods: Adolescent girls between 17-19 years of age with similar socioeconomic status were selected from 1st and 2nd year MBBS students for the study.

The height and weight were recorded and the BMI was calculated. The subjects were divided into 2 groups based on their BMI: those having normal weight i.e. Group I (n=30) and underweight i.e. Group II (n=30) according to the WHO criteria. The Auditory and Visual reaction time were measured by reaction time software indigenously prepared in computer programming language Visual Basic 6.0.

Results: The mean BMI levels in Group I was 21.23±1.1512 and Group II was 16.56±1.2407 (P<0.001).The VRT was prolonged in Group II and the result was statistically significant. ART was also prolonged in Group II but the result was not statistically significant.

Conclusion: The study showed that the BMI of an individual affect the audiovisual reaction time, which is an indirect measure of the sensory motor association.

07PP

Study of Cognitive Evoked Potential (P300) in Relation to Classical and Rock Music: A cross sectional study in Gauhati Medical College.

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Background: Studies have shown that the right kind of music can help us to relax our mind which enables us to concentrate better and perfect for studying. There are studies on the effect of music on our body, as exposure to music activates brain areas related with attention, semantics, music analysis, memory, and motor functions

Objectives: To verify the influence of exposure to different types of music (Classical and Rock Music) on P300 wave measurements & different tempos on P300 wave measurements.

Materials and methods: The Study was performed on 140 subjects, in the Neurophysiology Laboratory in the Department of Physiology. Name of the instrument is Neuroperfect .The P 300 waves were measured for three times during the test. First at starting of the experiment without music to the subject. Again after listening to both music the second and third times P300 were measured. Results: The ANOVA one-way test comparing the type of music (Slow Music and Fast Music) showed statistically extremely significant differences in P300 Latency (p=0.0001) and N2 Amplitude (p=0.0001). Thus, a comparison of different music speeds and types showed significant electrophysiological differences in groups of slow music and fast music.

Conclusion: Exposure to music at varying pre-established speeds altered P300 in the subjects significantly. It was shown that the tempo of music plays a crucial role and could be more important than the type of music played. Data from this

study has demonstrated that Slow music has shown to enhance cognitive performance.

08PP

A STUDY OF P2 LATENCY IN VEP IN HIGH RISK INFANTS

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BACKGROUND: High risk infants are at an increased risk of developing neuro-developmental delay. Visual evoked potential (VEP) provides a non-invasive and objective method to assess the functional integrity of visual pathway. Of all the waves P2 is most reproducible and consistent. The aim of the study is to show whether there is any P2 latency change in high risk infants compared to age matched controls and whether there is any difference between the two eyes of cases.

METHOD: An observational, cross-sectional study was undertaken where 28 high risk infants(56 eyes) and 28 controls(56 eyes) were subjected to mono-ocular Flash VEP testing with LED goggles following routine protocol according to ISCEV standards(2009) after proper consent and ethical clearance. Both cases and controls were in the age group 1-12 months and were obtained from Pediatrics OPD. Unpaired Student t-test was used and p-value<0.05 was taken as significant.

RESULT: Out of 56 eyes in high risk infants, 17(30.35%) showed absent waves and 33(58.92%) showed P2 latency delay (p<0.0001). For right eye (n=28), 8(28.6%) infants showed absent wave and 16(57.14%) showed P2 latency delay. For Left eye (n=28), 9(32.14%) infants showed absent waves and 17(60.17%) showed delayed P2 latency.

CONCLUSION: There was statistically significant prolongation of P2 latency in both eyes compared to age matched controls indicating visual pathway immaturity. There was no significant difference between Right and Left eye. Thus we can see that VEP can be used for early assessment of functional integrity and maturity of visual pathway.

09PP

Evaluation of Cognitive Evoked Potential in Type 2 Diabetes Mellitus Patients – A Cross Sectional Study in Gauhati Medical College.

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Background: Diabetes Mellitus is a clinical syndrome characterized by yperglycaemia due to absolute or relative deficiency of insulin. Cognition is a multidimensional entity and is concerned with full range of psychological processes ranging from sensation to execution. Diabetes mellitus is the most common metabolic disorder in man and is associated with structural and functional alterations in various organs, including the central nervous system. There is increasing interest in the impact of diabetes mellitus on cognitive functions.

Objectives: This study was conducted to evaluate the effect of type 2 diabetes mellitus on cognitive functions by evaluating the cognitive evoked potential P300.

Material and methods: 30 patients of type 2 diabetes mellitus aged 40-60 years on hypoglycemic drug treatment with disease duration more than 5 years constituted the test group and were compared with a control group comprising an equal number of same age, sex and educationally equivalent individuals without type 2 diabetes mellitus but possessing other criterias of inclusion and exclusion. The evaluation of P300 latency and amplitude were done.

Results: Diabetics had significantly longer P300 latency (mean=319.327±13.897) than the control group (mean=302.928±9.371) and it was statistically significant (t=5.359, p<0.05). P300 amplitude was significantly reduced in diabetics (mean=3.118±0.9208) than the control group (mean=5.206±0.6889) and it was also statistically significant (t=9.946, p<0.05).

Conclusion: This study shows that decline in cognitive functions occur and accelerate in type 2 diabetes mellitus which can be detected by evaluating cognitive evoked potential which can be useful in detecting the cognitive decline early in the course of diabetes.

10PP

PRESBYOPIA IN FEMALE: AN OVERVIEW

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Background: Presbyopia is a progressive irreversible reduction of accommodative amplitude of eye. Accommodative amplitude remains relatively stable in first two decades and significantly reduces thereafter requiring refractive near-correction from around 40 years of age. Though females are proved to have higher accommodative amplitude, in clinical practice requirements of presbyopic correction are often earlier and higher in them which is again enhanced by certain modifying factors.

Objective: To compare the age of attaining equivalent degree of presbyopia in two sexes and to evaluate the role of factors like occupation, ametropia, glaucoma, diabetes, smoking and hysterectomy on induction of early presbyopia.

Materials and methods: The study was conducted upon 250 females divided in 5 equal groups requiring 0.75-1.00D, 1.25-1.50D, 1.75-2.00D, 2.25-2.50D and 2.75-3.00D presbyopic corrections. Their ages were statistically compared with those of 250 equivalent males and among subgroups to analyze effects of occupation, ametropia, glaucoma, diabetes, smoking and hysterectomy on age of onset and degree of presbyopia.

Results: In females mean age of onset of presbyopia is earlier by 1.75 years and age of attaining equivalent presbyopia is less by 1.89+0.61 years. Among females, incidence of presbyopia is preceded by 3.3+1.41 years in hypermetropics, 3.74+1.89 years in smokers, 3.30+1.89 years in diabetics, 2.79+1.42 years in glaucoma patients and 1.75 +1.28 years in hysterectomyzedes than in their counter-groups.

Conclusion: Age of onset and attainment of equivalent presbyopia are much earlier in female. Equivalent presbyopia is earlier in outdoor-working, hypermetropic, smoking, diabetic, glaucoma-patient and hysterectomyzed females.

11PP

To study the effects of gender on visual evoked potential parameters

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Keywords: latencies, neurodiagnostic, pattern reversal visual evoked potentials, visual evoked potential.

Background: Visual evoked potential (VEP) is a useful noninvasive neurodiagnostic tool which permits assessment of functional integrity of visual pathways. It is affected by certain physical and physiological parameters. To date, only few baseline studies have been carried out in India assessing the effects of gender on VEP.

Objectives: The present study was conducted to evaluate the effects of gender on VEP parameters.

Material and Methods: 30 healthy subjects of either sex within the age group 18-40yrs were

recruited and divided into male and female group with 15 subjects in each group. Monocular pattern reversal visual evoked potentials (PRVEP) were recorded using standard protocol. Latencies and amplitude of various waveforms were calculated and studied.

Results: Our study revealed longer latencies of all the waves in male group than the female group in line with other such studies; however the difference was not statistically significant (p value > 0.05). Statistically insignificant difference in amplitude of P100-N75 and inter-ocular difference in P100 latency was also observed.

Conclusion: The present study disproved the influence of gender on VEP. However, more studies with bigger sample size and consideration of head size are advocated.

Abbreviations: VEP - Visual evoked potential, PRVEP - Pattern reversal visual evoked potential

12PP

Correlation between state anxiety and fine motor skills in computer users

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Background: Anxiety causes a significant reduction in perceptual-motor performance but no direct correlation has been reported so far between state anxiety and fine motor skills in computer users. Hence, the present study was aimed to assess the correlation between state anxiety and fine motor skills in computer users.

Methods: Forty five healthy computer users with ages ranged between 17 and 50 years (group mean age ± SD, 27.9 ± 6.4 years) were recruited for the study. Correlation study design was used for this study. Those who were using computer for minimum 6 hours a day, for six days in a week were included in this study. Those having any health problem, taking alcohol and any medication were excluded from this study. Signed informed consent of all participants was taken prior to the study and was approved by the Institutional Ethics Committee. Hand dominance of the participants was assessed using the Edinburg Handedness Inventory (Short form). State anxiety was identified using Spielberger's state trait and anxiety inventory (STAI-S), and fine motor skills were assessed using Lafayette Finger Dexterity Tester; USA. Data were analyzed using Pearson's correlation with SPSS version 18.0.

Result: Time taken for the fine motor skills task was found to be positively correlated with state anxiety ($p<0.05$).

13PP

Paediatric Multiple Sclerosis – Evaluating the role of visual evoked potentials in an alarming demyelinating condition

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Paediatric-onset multiple sclerosis is a rare childhood form of Multiple-Sclerosis (MS), an inflammatory demyelinating disorder of the central nervous system (CNS). There is no specific test for the diagnosis of MS. The diagnostic criteria include a combination of clinical and paraclinical studies. MS affects the CNS in dispersed areas and neuro-imaging techniques are most commonly relied upon to define the condition. The study aims to evaluate the role of visual evoked potentials in complementing the diagnosis of a case with paediatric-onset MS. A 15-year-old boy presented with weakness in both the lower limbs since three years with a history of episodes of muscle cramps in a relapsing manner with no family history. Clinical

examination was performed and investigations were done including magnetic resonance imaging (MRI) and visual evoked potentials. The diagnosis was suggested as multiple sclerosis. Silent optic nerve involvement was diagnosed by visual evoked potentials, while MRI scans demonstrated bilateral normal optic nerves. Hence, visual evoked potentials prove to be more sensitive, cheaper and easy tools in silent optic nerve involvement in MS, elaborating and confirming the diagnosis of the condition.

14PP

Role of cyclic nucleotide phosphodiesterases during meiotic resumption from diplotene arrest in mammalian oocytes

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Key words: PDEs; Cyclic nucleotides; MPF; Meiotic cell cycle; Mammalian oocytes

Cyclic nucleotide phosphodiesterases (PDEs) are group of enzymes that hydrolyze cyclic nucleotides in wide variety of cell types including encircling granulosa cells as well as associated oocytes. One group of PDEs are located in encircling granulosa cells and another group get expressed in the oocyte, while few other PDEs are expressed in both compartments. The PDE1A, PDE4D, PDE5A, PDE8A and PDE8B are granulosa cell specific PDEs that hydrolyze adenosine 3',5'-cyclic monophosphate (cAMP) as well as guanosine 3',5'-cyclic monophosphate (cGMP) with different affinities. PDE3A, PDE8A as well as PDE9A are expressed in oocyte and specifically responsible for the cyclic nucleotide hydrolysis in the oocyte itself. Few other PDEs such as PDE7B, PDE10A and PDE11A are either detected in granulosa cells or oocytes. Activation of these PDEs either in encircling granulosa cells or in oocyte directly or indirectly reduces intraoocyte cAMP level. Reduction of intraoocyte cAMP level modulates phosphorylation status of cyclin-dependent kinase 1 (Cdk1) and triggers cyclin B1 degradation that destabilizes maturation promoting factor (MPF) and/or increases Cdk1 activity. The destabilized MPF and/or increased Cdk1 activity leads to resumption of meiosis, which initiates the achievement of meiotic competency in preovulatory follicles of several mammalian species. Use of specific PDEs inhibitors block cyclic nucleotides hydrolysis that results in increase of intraoocyte cyclic nucleotides level, which leads to maintenance of meiotic arrest at diplotene stage in vivo as well as *in vitro*. Thus, cyclic nucleotide PDEs play important role in the achievement of meiotic competency by reducing intraoocyte cyclic nucleotides level in mammalian oocytes.

15PP

TRANSCRANIAL MAGNETIC STIMULATION IN REDUCING CHRONIC PAIN AND THE RELATED SYMPTOMS IN PATIENTS WITH FIBROMYALGIA

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Keywords: Fibromyalgia, TMS, chronic widespread pain, tender points.

BACKGROUND: Fibromyalgia (FM) is a pain syndrome characterized by widespread musculoskeletal pain and tenderness at multiple points in the body. Sleep disturbance, anxiety and depression are significant coexisting factors. Poorly understood aetiopathogenesis makes its treatment a challenging task. Non-invasive repetitive transcranial magnetic stimulation (rTMS) of the cortex has been implicated in pain relief in such chronic conditions.

OBJECTIVES: The purpose of the present study was to examine the effects of rTMS, of right dorsolateral

prefrontal cortex (DLPFC) in pain status, quality of life, depression and anxiety FM patients.

METHODS: Fifty-six patients with fibromyalgia were randomly divided into real (n=27) and sham rTMS (n=21). The real rTMS (l Hz) was administered using a figure of 8 coil for 5 days a week for four weeks and compared with sham group. Pain and stress was assessed by specific questionnaires before and after completion of therapy. Nociceptive flexion reflex was recorded to objectively assess pain.

RESULTS: In real rTMS group, the average rating scores for pain and other associated symptoms significantly decreased from baseline after completion of four weeks of therapy. Sham TMS group revealed no significant changes in rating of MPQ, VAS, HDRS, HARS and WHOQOL-BREF questionnaires. The results indicate no improvement in chronic pain, depression, anxiety and quality of life in sham group.

CONCLUSION: rTMS applied over the right dorsolateral prefrontal cortex significantly reduced widespread pain and the related symptoms suggesting its role as an effective alternative analgesic treatment modality for fibromyalgia.

16PP

Effect of repetitive transcranial magnetic stimulation on pain status in chronic tension type headache

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Background: Tension-type headache (TTH) is the most common type of primary headache. Its chronic form is often the most ignored and challenging to treat. Aim of this study is to investigate the effect of repetitive Transcranial Magnetic Stimulation of right Dorsolateral PreFrontal Cortex in CTTH patients.

Objectives: To study the effect of rTMS on pain status of CTTH patients by subjective and objective methods of pain assessment.

Methods: A randomized control trial was conducted after approval from institute ethics committee . 30 patients of CTTH (according to ICHD3-beta) were recruited from neurology outpatient department of All India Institute of Medical Sciences, New Delhi. After obtaining informed consent the patients were randomized to active or sham TMS groups. Subjective assessments of pain rating by Visual analogue scale and questionnaires were given to assess the experience of pain and for objective assessment, nociceptive flexion reflex was recorded by stimulating the sural nerve . Transcranial Magnetic stimulation of 1Hz frequency on the right dorsolateral prefrontal cortex was given for 20 days and pre and post intervention data was analyzed.

Results: Significant improvement in visual analogue score, HIT-6 ,WHO physical quality of life and nociceptive flexion reflex was seen in the active rTMS group.

Conclusions: Repetitive transcranial magnetic therapy of right dorsolateral prefrontal cortex (DLPFC) is effective in management of CTTH and may be considered as an adjuvant or independent therapy for the same.

17PP

Spinal H-Reflex Asymmetry in Lower Limb of Meningomyelocele Infants

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Background: In infants with meningomyelocele (MMC), the impact of neurodevelopment malformation affects the segment of spinal cord.

Motor neuronal excitability in affected caudal segment of spinal cord of MMC is assessed with the help of non-invasive electrophysiological studies (H-reflex).

Objective: To evaluate the variation of spinal H-reflex in lower limbs of infants suffering with meningomyelocele of lumbosacral region.

Subject and Method: 26 FT AGA babies between the age group from birth to 37 days were subjected to electrophysiological assessment. Out of them 12 babies were diagnosed as MMC of lumbosacral region and remaining 14 were normal infants. Electrophysiological studies were done with surface electrodes using BSL Advanced System and GRASS Stimulator. H-reflex latency (HRL), maximum amplitude of H-reflex (Hmax), maximum motor response (Mmax), H/M ratio and HRCV (H reflex conduction velocity) were recorded in both the lower limbs (posterior tibial nerve - soleus muscle) in all the infants.

Result: H- reflex were elicited in both the lower limbs of all the normal infants, and the other parameters (HRL, Hmax, MRL, Mmax, H/M%, HRCV) were similar in their two limbs. In MMC cases, H-reflex were elicited in both the limbs in 5 infants only and the Hmax values in their left limbs were significantly more than their right limbs.

Conclusion: Side asymmetry was noticed in lower limbs of MMC infants as Hmax values were more in left limbs than their right limbs. H-reflex parameter asymmetry indicates nerve root involvement of that segment of spinal cord.

18PP

Study of Neurophysiological impact of caffeine using Stroop task

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Background: Caffeine is one of the most widely used psychostimulant worldwide. Its effects on central nervous system have been variously studied using EEG, evoked potentials, fMRI, and neuropsychological tests. The Stroop task is a widely used tool in psycho-physiology to understand the attention processes and is based on the principle that processing of two different kinds of information is parallel and at different speeds with a common response channel.

Aim: To study the effect of caffeine intake on classical color word Stroop task.

Materials and Methods: This study was conducted on 42 undergraduate students by performing a test before and 40 minutes after consuming 3 mg/Kg caffeine and evaluating the effect of caffeine on mean reaction time to neutral, congruent and incongruent stimuli .

Results: Paired t-test was used to analyse the change in mean reaction times pre n post caffeine for each stimuli and one way Anova test was used to predict the effect of caffeine on cumulative mean reaction times. The level of significance was kept as 0.05. The p Value for change in mean reaction times for congruent, incongruent and neutral stimuli was less than 0.0001 which is extremely statistically significant.

Conclusion: We hypothesize that caffeine by altering the levels of neurotransmitters leads to processing of relevant information in the classical color word Stoop task which manifests as faster reaction times across all three conditions.

19PP

Intra-operative neurophysiological monitoring during spinal cord surgeries to preserve function of external anal sphincter

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Background: Preservation of function of the anal sphincter during surgeries of spinal cord is a major concern. The fibres supplying the external anal sphincter (EAS) emerge at the level of S2, S3 and S4. Any surgical damage to these can cause sphincter dysfunction which drastically affects patient's quality of life. Hence their identification is crucial.

Method: The identification and monitoring of the neural fibres supplying the EAS was done in 25 patients diagnosed with tethered cord, spinal cord tumours, split cord malformation and spinal cord deformities. The standard total intravenous anaesthesia protocol was used and no muscle relaxant was administered after initial intubation. The electromyogram (EMG) of the EAS was recorded using dual twisted needle electrode inserted at 3 and 9 `o' clock positions. The protocol was set for free running and triggered EMG. The stimulation was done with concentric bipolar probe for better spatial resolution with stimulation frequency of 2 Hz in pulse mode with normal polarity. The current strength was titrated for each case.

Result: The neural fibres supplying the EAS were accurately identified in all the cases. The current strength required to trigger contraction of EAS intra-operatively was 2 to 3 mA for pulse duration of 0.5 mSec. The identified fibres were spared during the surgical procedures. All patients woke-up with preserved function of the EAS.

Conclusion: Intra-operative identification and monitoring of the neural supply of EAS is an indispensable technique to ensure EAS's functional integrity and thereby minimize neurological morbidity during surgeries of spinal cord.

20PP

Mapping of Wernicke's area in patients during awake craniotomy

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Background: Surgical excision of temporal lobe tumor entails a high risk of excision of language areas of cerebral cortex that can affect the quality of life of patients. Intraoperative mapping of language area can assist neurosurgeons salvage the language area.

Method/Procedure: Wernicke's area mapping was done in 3 patients. The patients were familiarized with the language mapping protocol prior to the surgery. The language assessment tasks included identification and naming of picture of objects, reading sentences in Hindi and English, counting numbers and simple calculations. The standard anesthetic protocol for awake craniotomy was followed. After exposure the patient was presented with the language assessment tasks similar to the protocol followed earlier. Cortex was stimulated with a bipolar probe to map Wernicke's area. Stimulation current was delivered at 60 Hz square wave biphasic pulses of 1ms duration. Current strength was titrated for each case and ranged between 10-14 mA for stimulation. Interruption of the performance of the language task was used for identification of language area. The boundaries for tumor resection were decided based on the identification of language area through mapping.

Result: Language mapping was successfully done in all the cases at multiple time points during tumor resection taking about 30-40 minutes in each case. Language function was preserved in all the cases.

Conclusion: Identification of Wernicke's area through language mapping was found to be extremely useful in increasing the extent of tumor resection as well as safe tumor removal, thus preventing any postoperative language deficit.

21PP

Temporal trend of changes in baroreflex sensitivity during the course of healthy pregnancy

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Introduction: During pregnancy, cardiovascular system undergoes several adaptations to optimize the fetal growth. The aim of the present study was to study the sequential changes in baroreflex sensitivity (BRS) during the course of healthy pregnancy.

Methods: Healthy pregnant women (n=66) with singleton pregnancy were recruited in their first trimester and followed up till delivery. Beat to beat blood pressure (by using Finometer®) and ECG was recorded simultaneously to determine the BRS at three time points ie. 1st trimester (11-13+5weeks), 2nd trimester (20-22+5weeks), and 3rd trimester (30-32+5weeks). Friedman test with Dunn's post hoc test was used for statistical analysis.

Results: There was a significant reduction in BRS during the course of pregnancy in healthy pregnant women (mean age 25.87±3.1 years), as assessed by both sequence method {All BRS SBP- 1st trimester vs 2nd trimester vs 3rd trimester: median (interquartile range); 16.31(11.04 –23.13) vs 11.42(8.54-19.52) vs 8.84(7.15-12.45) ms/mmHg, p<0.0001)} and spectral method {Alpha LF SBP; 4.11(2.99-5.45) vs 3.02(1.76-4.90) vs 2.09(1.12-3.26) ms/mmHg, p<0.0001 and Alpha HF SBP; 6.02(3.39-8.02) vs 4.06(2.34-6.12) vs 2.63(1.57-4.10) ms/mmHg, p<0.0001)}.

Conclusion: Although, various cardiovascular adaptations associated with pregnancy are.

22PP

A Study of Reaction Time in Type II Diabetic Patients: An Observational Study

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Keywords : Reaction time, Neurological derangement,Type II diabetes & Statistical significance

Background: Diabetes mellitus is a group of metabolic diseases in which a person has high blood glucose either because the body does not produce enough insulin or because cell do not respond to the insulin that is produced. Reaction time is a reliable indicator of sensory stimulus by central nervous system and its execution in the form of a motor response. Reaction time is the interval of time between the application of a stimulus and appearance of appropriate voluntary response in a subject. It is underestimated element in medical fitness test for professionals highly dependent on the motor skills such as drivers, pilots and doctors. Thus , this study was undertaken to determine the effect of type 2 diabetes mellitus on reaction time.

Objective: The objective of the study is to see the effect of diabetic mellitus on reaction time Material and methods: 100 diabetic cases and 100 diabetic free cases of age group 35-60 years were undertaken for the study .Inclusion criterion was all the known diabetic cases who visited the Medicine OPD of the IIMS& R & were willing to participate in the study. Exclusion criterion was all the cases free of the disease. Simple reaction time was measured for both groups.

Result: Data was analyzed by using SPSS of version 20.0. The mean auditory reaction time & visual

reaction time in diabetic cases were 220.20 ms (±62.02) & 290.80 ms (±82.02) respectively. While in healthy group the auditory and visual reaction time were 180.20 ms (±52.02) & 230.80 ms (±72.02) respectively .The effect of diabetes in reaction time was statistically significant (p<0.01).

Conclusion: Reaction time may prove a simple and valuable method for assessing severity of neurological derangement and effectiveness of treatment in Type II diabetes.

23PP

Relationship between Intelligence Quotient and Reaction time in Slow Learners School Going Children

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Key Word: Reaction Time, intelligence quotient, Correlation, Slow learners

Background: The time interval between the application of the stimulus and appropriate motor (voluntary) response is termed as response latency or reaction time. The study of Reaction time provides an indirect index of the processing capability of central nervous system. Although, the relationship between reaction time and Intelligence Quotient(IQ) scores involves an important part of theoretical information processing approaches towards individual differences, data obtained in this area are sparse or even non-congruent.

Objective: The purpose of this study was to assess the reaction time in slow learners school going children and to find out the association between intelligence quotient (IQ) and Reaction time (RT)

Materials and Methods: The study subjects were taken randomly from Techno Academic School .The inclusion criterion was all disease free students aged between 10 to 17 years of age with below average annual performance in school.The machine "IMCORP Ambala Reaction Time Instrument" was used to acquire the simple reaction time data in children. After the collection of data,it was analyzed by using the SPSS of version 20.0 and MS Excel of version 7.

Result: Karl Pearson correlation coefficient between intelligence quotient (IQ) and Reaction time (RT) was found to be 0.426 (p<0.05) with statistical significance.

Conclusion: The association of reaction time and IQ is significant so these two measurements can be the simultaneous markers of neurological functions in school going children

24PP

Role of physiologist in neuromonitoring during neurosurgery

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Introduction: Intraoperative neuromonitoring (IONM) provides real-time information to neurosurgeons about the functional status of nervous system during surgery. This case report demonstrates the role of trained physiologists as part of operative team to identify the impending neural deficit during the surgery.

Material and method: A 15 year old girl suffering from diastematomyelia with bone spur and spinal lipomeningocele at the level of L1-L2 was operated for detethering, excision & repair of

lipomeningocele along with IONM with Motor evoked potential (MEP) and triggered EMG. 'Corkscrew' and concentric bipolar probe was used for stimulation and recording were done with needles electrode from upper & lower limb muscles. A concentric bipolar stimulation probe was given to surgeon for identification of neural tissue during the surgery.

Result: The baseline recording of EMG and MEP were taken after induction of anesthesia and a regular interval during the surgery. An IONM was sounded during the surgery when the MEP recording from left lower limb significantly decreased that coincided with excision of bone spur. The physiologist performing IONM predicted the complete loss of left lower limb power after eliminating possible anaesthetic and technical causes of drop in MEP. On extubation the patient had 0/5 power that improved to 1/5 on 10th day post-surgery when the patient was discharged.

Conclusion: A well trained Physiologist plays an important role during the neurosurgery in accurately predicting the neural function with the help of techniques of IONM and should be part of surgical team in the operation theatre.

25PP

EFFECT OF ENDURANCE AND RESISTANCE TRAINING ON PULMONARY FUNCTION IN YOUNG INDIVIDUALS OF NORTH INDIAN POPULATION

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Background: Exercise has a positive impact on cardiorespiratory functions. Two types of exercise trainings – resistant training and endurance training might have a variable physiological effect on cardiorespiratory functions.

Aim: To evaluate and compare the effect of resistant and endurance exercise training on pulmonary functions.

Methodology: A total of 50 young healthy non-smoker males aged 18-24 years were randomly allocated to two groups – Group A (n=25) subjects underwent resistance whereas Group B (n=25) subjects underwent endurance exercise training for 12 weeks (thrice a week). Both the groups were matched hemodynamically and anthropometrically. Baseline evaluation of pulmonary functions (FVC, FEV1, FEV1/FVC, FEF25-75% and PEF) was done. After 12 weeks pulmonary functions were evaluated once again. Change in pulmonary functions in both the groups was evaluated using Independent samples and paired't'-test.

Results: At Mean FVC, FEV1, FEV1/FVC, FEF25-75% and PEF were 4.13±0.57, 3.46±0.50, 0.83±0.02, 3.79±0.52 and 8.23±0.32 respectively in Group A and 3.98±0.48, 3.35±0.41, 0.84±0.02, 3.49±0.57 and 8.13±0.38 respectively in Group B. After 12 weeks of training these values were 4.28±0.51, 3.69±0.45, 0.85±0.02, 3.86±0.40 and 8.65±0.30 respectively in Group A and 4.14±0.46, 3.61±0.35, 0.87±0.02, 3.77±0.37 and 8.54±0.36 respectively in Group B. Overall improvement in pulmonary functions ranged from 3.02% (FEV1/FVC) to 7.14% (FEV1). Difference between two groups was significant statistically only for post-treatment FEV1/FVC values which were significantly higher in Group B as compared to Group A.

Conclusion: Exercise training (resistance as well as endurance) provided a significant improvement in pulmonary functions. Nominal differences between two types require further exploration.

26PP

A correlational study between spinal flexibility and waist circumference in persons with central obesity

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Background: Previous research has shown a relationship between central obesity and low back pain. However, no direct correlation has been explored between central obesity and flexibility of the spine. Hence the present study was designed to see the relationship between central obesity and spinal flexibility.

Methods: Twenty male volunteers with ages ranged between 30 to 50 years (group mean age±SD, 40.1±6.3 years) were recruited for the study. Those participants were included who had waist circumference (W.C.) more than 90 cm. This was a cross sectional study design with onetime assessment. Signed informed consent of all participants was taken prior to the study and was approved by the Institutional Ethics Committee. Waist circumference of the participants was measured using standard measuring tape and spinal flexibility was measured using sit-and-reach apparatus (Lafayette Instruments, Model No. 01285A, USA). Signed consent form was obtained from all the participants prior to the assessment. Relationship between central obesity and spinal flexibility was determined by using Pearson's correlation with SPSS version 18.0.

Result: Central obesity was not found to be significantly correlated with lower spinal flexibility ($p>0.05$).

Conclusion: The result of the study indicated that adiposity does not influence the flexibility of spine.

27PP

Respiratory exchange ratio during isometric and isotonic exercise

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Introduction/Background: Isotonic and isometric contractions are changes that take place in the muscles when they move or come under some form of physical stress. The present study is designed to assess the fat oxidation after isotonic and isometric exercises by finding Respiratory exchange ratio (RER).

Aim and objectives: To compare RER of isometric exercise to isotonic exercise by calculating CO2 production and O2 uptake.

Material and methods: The study was conducted in exercise lab, KGMU, Lucknow. 20 apparently healthy subject aged 18 to 35 years were enrolled after proper consent. They were randomized to two groups (A and B).They were made aware of Borg's scale of perceived exertion. Group A performed isometric exercise using handgrip dynamometer at 30% maximum voluntary contraction (MVC) for 2 mins. Group B performed isotonic exercise at 30% MVC at a rate of 30/min for 2 mins. RER was calculated just before and after exercises using formula (CO2 production/O2 uptake) in exercise lab using AD Instruments gas analyser. They crossed over after 2 days and again performed exercise (group A performed isotonic exercise and group B performed isometric exercise). RER was calculated again just before and after exercise.

Result/Conclusion: RER was found to be statistically significantly lower for isotonic exercise compared to isometric exercise with a P value <0.005. A low RER suggests lipid oxidation. Therefore RER can be used as an indicator for metabolic fitness during physical intervention programs.

28PP

Plastic toxin Bisphenol-A delays gastric transit time in adult male rats.

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Background: Bisphenol-A (BPA) is a toxic chemical used to make polycarbonate plastics and epoxy resins, which are incorporated in variety of plastic containers for food and beverage packaging. However, there are inadequate studies to assess the movement of BPA containing food along the gastrointestinal tract. The present study, using rat model, attempted to understand, if the transit time of food is affected by orally administered BPA.

Materials & Method: The study was carried out in 75 adult male albino rats. BPA treated rats were divided into 6 groups for assessment of gastric, ileocecal and colonic transit time (n=5, each group), after acute exposure to BPA (2 µg/kg and 50 µg/kg) with food and also chronic exposure (n=5, each group) of BPA (50 µg/kg/day) for 28 days. Control group was prepared by Sam feeding the same food without BPA. The transit time was assessed by standard charcoal marker method, at various time intervals (30 min and 120 min) for assessment of gastric and ileocecal transit time. Colonic transit time was assessed by recording the time for first marker coated feces pellet discharge.

R**esults:** In acute experiments, gastric transit time in rats fed with either 2 µg/kg body wt. or 50 µg/kg body wt. was significantly increased ($P<0.05$, n=5), without affecting the ileocaecal and colonic transit time. However, in the group of rats which were chronically fed with BPA did not show any significant alteration ($P>0.05$, n=5), for any of the transit time.

Conclusion: BPA containing food pellet delays gastric transit time by mechanisms yet to be delineated.

29 PP

PRETREATMENT WITH PROSTAGLANDIN E1 AGONIST PREVENTS OLEIC ACID-INDUCED LUNG INJURY IN RATS IN THE INITIAL PHASE

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BACKGROUND: Acute lung injury (ALI) is a frequent cause of hypoxemic respiratory failure associated with inflammation and pulmonary edema. Prostaglandins play a role in inflammation. Therefore, this study was conducted to examine the effect of pre vs post treatment of acute lung injury by misoprostol, a prostaglandin E1 agonist.

METHODS: Tracheal cannulation (for the patency of respiratory tract) and jugular vein cannulation (to deliver saline/oleic acid/drug) was done in anesthetized rats. Animals were divided into four groups. In group I, oleic acid (OA) was injected to induce ALI. In group II (time-matched control), saline was injected. In group II and IV, misoprostol was injected before and after OA respectively. In all groups respiratory frequency, PaO2/FiO2 ratio, pulmonary water content and survival time was determined.

RESULTS: OA produced ALI as manifested by features of hypoxemia like tachypnea followed by decrease in respiratory frequency and PaO2/FiO2 ratio leading to death of the animals by 90 min. Pulmonary water content was increased significantly as compared to control group. Misoprotol pre or post treatment prevented the initial tachypnea but the overall survival was similar to OA only group. PaO2/FiO2 ratio was improved in both pre or post treated group but was significantly less than control group. Pulmonary water content was decreased as compared to OA only group but was significantly greater than control group.

CONCLUSION: Prostaglandin E1 agonist (misoprostol) is involved in the pathophysiology of ALI. Pre or post treatment with misoprostol is helpful only in the initial phase of ALI but does not alter the course of disease.

30PP

Understanding aspartate metabolism in *Leishmania donovani* asparaginase knockout mutant

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Background: Visceral leishmaniasis caused by *Leishmania donovani* continues to be life threatening disease claiming many lives especially in the Indian subcontinent. Emergence of resistant strains against current treatment regimens is also aggravating the problem. Understanding of key metabolic pathways will improve our understanding of the parasite and will aid in developing effective treatment regimens. In the current study aspartate metabolism pathway in *L. donovani* is currently being explored.

Objectives: Understanding of aspartate metabolism in the unicellular parasite *L. donovani* by generation of *L. donovani* knockout mutants of asparaginase and employing transcriptome and metabolite analysis to understand the pathway contribution in growth and infectivity of the parasite.

Materials and methods: *L. donovani* mutants lacking asparaginase gene were generated using homologous recombination based approach. Aspartate metabolic pathway and related pathways in the mutant were analyzed by qRT-PCR based approaches.

Results: *L. donovani* asparaginase knockout mutants were generated by electroporating linearized knockout cassettes which comprised of 5' UTR and 3'UTR (untranslated regions) of the asparaginase gene flanking the antibiotic resistant site. For generation of double knockouts two antibiotic selections were employed. Relative mRNA expression will be analyzed using real time PCR based system.

Conclusion: *L. donovani* asparaginase knockout cassettes were generated by cloning UTR regions on either side of the antibiotic resistance gene. The role of aspartate metabolism needs to be assessed in the mutant parasite**.**

31PP

EFFECT OF OCULAR PERFUSION PRESSURE ON ISOMETRIC HANDGRIP TEST IN PATIENTS WITH PRIMARY OPEN ANGLE GLAUCOMA (POAG) : A TEST FOR AUTONOMIC ACTIVITY.

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Background: Glaucoma is diagnosed by presence of "classical triad"- characteristic feature of visual field defects, morphological changes in optic disc (cupping) and raised intraocular pressure (IOP). Several studies related to blood pressure and ocular perfusion pressure (OPP) implicated vascular risk factors in the pathogenesis of glaucoma yet abnormal autoregulation in glaucoma is not fully clear. The most common method of evaluating autoregulatory function is through provocation like isometric hand grip, head up tilt testing, which put the vascular system under stress and evoke an autoregulatory response maintaining normal ocular perfusion, a failure to this is indicative of disturbed autoregulation.

Materials and methods: The study subjects of age between 45-65 years of either sex comprised of 20 patients with Primary open angle glaucoma (IOP >21mmhg) (group II) and 20 age and sex matched healthy controls (group I). Blood Pressure and Mean OPP was recorded at rest and immediately after relaese, then after 5minutes. MOPP was calculated as MOPP=2/3MAP – IOP.

Results: Mean basal MAP in group II was significantly higher (104.73 ±1.45) (p=0.001) as compared to group I. The findings showed highly significant low values of basal MOPP (p<0.000) in group II (POAG) compared to control group. During handgrip test the value of MAP was significantly higher and MOPP was significantly low (P<0.000) in group II. The significant high value of MAP (p<0.000) and low MOPP in group II during recovery period indicated delayed recovery due to sympatho-vagal imbalance.

Conclusion: Basal values of MAP and MOPP and changes observed during isometric exercise (stress test) and during recovery period indicated ocular vascular alterations and abnormal autoregulatory mechanism in POAG patients as compared to healthy controls.

32PP

A Study of Autonomic Sympathetic Activity in Pregnancy by handgrip dynamometry

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Background: Pregnancy is associated with profound changes in the cardiovascular system. Autonomic sympathetic nervous system plays an important role for the circulatory adaptations in pregnancy. Some studies have reported conflicting cardiovascular sympathetic nervous activity during pregnancy. Therefore this study was conducted to evaluate the autonomic sympathetic activity at various stages of pregnancy by handgrip dynamometry.

Methods: 60 apparently healthy pregnant women, 20 in each trimester, in the age group of 20-30 years with singleton pregnancy were included for the study. Blood pressure (BP) response to isometric handgrip was measured as per standard procedure described by Piha SJ. BP was recorded with the help of mercury sphygmomanometer and stethoscope in sitting position. The difference in diastolic blood pressure (DBP) was noted. The data collected were entered using SPSS version 21 (IBM). Analysis was done using ANOVA.

Results: Mean age of the participants was 24.85 years (±3.33). It was observed that fall in sympathetic activity was present in all three trimesters, but more in second trimester (6.70±2.99) as compared to first (13.30±2.84) and third trimesters (10.40±3.92) and is found to be statistically significant (p<0.05).

Conclusion: Sympathetic activity decreased up to mid-term of pregnancy and return towards pre-pregnant level as pregnancy advances.

33PP

Effect of aerobic exercise on Autonomic function

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INTRODUCTION: physical exercise is any bodily activity that enhances or maintains physical fitness and improves overall health and wellness. However, cardiac autonomic regulation in long term exercise has not been well quantified .In this study autonomic changes following exercise have been studied.

AIM AND OBJECTIVE: To quantify autonomic functions in healthy adults before and after three months of aerobic training .Blood pressure response and heart rate response to lying-to – standing test (30:15 Ratio)

MATERIAL AND METHOD: After ethical clearance,60 apparently healthy male subjects aged 18—35 yrs and Body mass index between 18.5-24.5, were taken after due consent. They were divided into control (30 subjects) and exercise group (30 subjects).Blood pressure response and Heart rate response to lying-to-standing test(30:15 Ratio) was

performed by both the groups before and followed by aerobic exercise(Running in Treadmill) for three months. Same response were measured in all again after aerobic training of three months.

RESULT/CONCLUSION: In exercise group 30:15 ratio is increased. Blood Pressure is not significantly change.

34PP

Autonomic tone in lean polycystic ovarian syndrome patients: a study at a tertiary care hospital in India

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Background: Polycystic Ovarian Syndrome (PCOS) is usually associated with cardiac autonomic dysfunction. We assessed Heart Rate Variability (HRV) in response to exercise challenge test in PCOS patients and healthy controls.

Materials and Methods: The study population consisted of 29 controls and 32 PCOS patients. Waist-hip ratio (WHR) was calculated as the ratio of waist circumference to hip circumference. Subjects performed bicycle ergometer exercise at 50-85% of target heart rate for 6 minutes followed by cool down period of 20 minutes. Lead II ECG was recorded throughout. Short term HRV was compared in time domain (SDNN, RMSSD and pNN50%) and frequency domain (LF, HF and LF/HF ratio) during baseline, 5 minutes and 15 minutes post exercise respectively. Fasting blood glucose and Insulin samples were collected the next morning for HOMA-IR estimation.

Results: Waist hip ratio was found to be significantly higher in cases compared to controls (p=0.03). Baseline time and frequency domain parameters were comparable but post-exercise readings were lower in cases. SDNN values were significantly reduced at 15 minutes (p=0.042), LF was significantly lower in cases at 5 minutes and 15 minutes (p= 0.015). HOMA-IR values were higher in cases, though not statistically significant.

Conclusion: "Lean" PCOS patients, with higher WHR and HOMA-IR, exhibited an impaired sympathetic tone in response to exercise. Our results suggest central obesity and Insulin resistance are prime contributors to cardiac autonomic dysfunction in PCOS patients. Heart Rate Variability should be utilised as an early diagnostic indicator of initial cardiovascular autonomic changes in the PCOD patients.

35PP

A comparative study between classical autonomic function test (Ewing's protocol) and short term heart rate variability analysis in detection of autonomic dysfunction among apparently healthy adults

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Introduction: Autonomic nervous system (ANS) dysfunctions are seen in many diseases. Assessment of ANS dysfunction is usually done by Ewing's test protocol and also by heart rate variability (HRV) analysis.

Aim: To compare results of Classical Ewing's test protocol with Short term Heart rate variability analysis in healthy Indian adults.

Methods: Thirty healthy adults, 18 to 40 years of age had been selected. Heart rate response to change of posture, deep breathing difference, valsalva maneuver along with blood pressure response to change in posture and isometric hand grip test were performed. Short term HRV analysis was done by time and frequency domain analysis of R-R intervals.

Results: In our study we found early autonomic neuropathy in 13.33 % in Ewing's protocol and abnormal HRV values in 43.33% of subjects. 't' test showed significant difference between mean of HRV values of our study population having normal ANS function (detected by Ewing's protocol) and the normative values of Task Force of the European Society of cardiology, in low (LF) and high (HF) frequency (both normalized unit and ms^2) and LF/HF ratio ($p < 0.05$).

Conclusion: HRV analysis seems to have higher capacity to detect autonomic dysfunction. However due to wide differences in HRV values every laboratory should create its own normative value for HRV with sufficiently large sample with strict observance of pretest criteria and then only true utility of both methods can be compared.

36PP

Effect of Tobacco on the Alteration of Lipid Profile in Oral Carcinoma

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Aim: To study the role of tobacco in the alteration of lipid profile in malignant lesions of oro-pharynx.

Introduction: Lipids are major cell membrane components. They are important for various biological functions like cell growth and division of normal and malignant cells. The alterations in circulatory cholesterol level have found to be associated with the etiology of breast cancer and colorectal carcinoma. The decrease in the plasma lipid profile in head and neck cancer is associated with tobacco consumption, which is also a important factor in the etiology of cancer. Thus the aim of our study is to study the affect of tobacco on the lipid profile in the cases diagnosed with malignancy of oro-pharynx.

Material and Method: The study was undertaken in Department of Physiology and Pathology Maulana Azad Medical College. Normal Control : n=300, Squamous cell carcinoma: n=500. The blood sample of the patients were collected and were sent for lipid profile analysis to biochemistry lab. The detailed history was taken with regard to tobacco smoking and chewing.

Result: The serum total cholesterol, LDL, VLDL & triglyceride levels were significantly decreases in malignant lesions. However there was an increase in HDL levels which may be due to the altered functioning of lipoprotein lipase.

37PP

The measurement of blood pressure in winter season and its co –relation With blood pressure after cold exposure in summer season : a cross-sectional Study in gauhati medical college and hospital , guwahati

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BACKGROUND: It has been shown in several studies that immersion of whole body or peripheries e.g. feet immersion during summer also causes rise in blood pressure due to peripheral vasoconstriction. Exposure to cold elicits a generalized cutaneous asoconstriction that is especially pronounced in hands and feet. The present study aimed at simulating the minimum winter temperature at Guwahati by immersing both feet in cold water at around 12 degree centigrade for 10 minutes, and observing the change in blood pressure.

OBJECTIVES: To study whether there is any similarity in blood pressure measured in winter season in relation with blood pressure after cold exposure in summer season.

MATERIALS AND METHODS: After getting approval from institutional ethical committee, 50 healthy

normotensive male individuals were selected randomly from Guwahati city. First blood pressure of each individual was measured in winter season by conventional method using mercury sphygmomanometer and stethoscope. During summer blood pressure was measured in same individual after cold exposure i.e. after immersion of feet in cold water. Data analysis was done in Microsoft Excel 2007.

RESULTS: "p" value was obtained after doing data analysis by using Graph Pad software. After comparing both systolic and diastolic BP during summer and winter at baseline, after 5 min exposure and 10 min exposure to cold in summer season revealing statistically significant "p" value (p=<.05).

CONCLUSION: Our study has revealed a higher systolic and diastolic BP in winter and in summer after cold exposure than baseline summer BP; so we conclude that if we get a higher BP in winter season those subjects are susceptible to develop higher BP with cold exposure even during summer

38PP

Salt Sensitive Hypertension: Pathogenesis, effects and management plans.

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Hypertension is known to effect humans worldwide and is becoming commoner day by day. Nearly, 1 billion of population suffers from it worldwide. Salt sensitivity is a measure of how blood pressure responds to salt intake. The pathogenesis of salt sensitive hypertension is mainly attributable to an impaired renal capacity to excrete sodium. Obesity, metabolic syndrome, low to normal aldosterone levels and renal specific sympathetic activation have also been implicated in its pathophysiology. Recent researches have also highlighted the role of vascular endothelial dysfunction. If left untreated, effects are detrimental. The vessel walls become thick and stronger in order to counter the increase pressure, which in turn leads to narrowing resulting in elevated pressures. The raised blood pressure may damage the arteries leading to the brain. Reduction in cerebral blood supply may lead to vascular dementia. Salt sensitivity has been associated with increased cardiovascular disease and reduced survival. Thus, cardiovascular and end organ damage is more pronounced in salt sensitive hypertension. Need of the hour is dietary management and weight reduction programs which assume more significance in the current era of stress and junk foods. It being the tip of iceberg disease requires early prevention as well as diagnosis, for which medical camps should be organized on routine basis in every school, college and work place.

39PP

Receptors present in the peripheral blood vessels can modulate the cardiorespiratory responses in anesthetized rats

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Objective: It has been suggested that autonomic and cardiorespiratory changes are mediated by the activation of sensory receptors around the peripheral blood vessels. But, the function of sensory receptors and afferents from the peripheral blood vessels is not known in this regard. This study was conducted to examine the role of perivascular receptors and the afferents involved in it.

Method: Experiments were performed after obtaining the approval from the Institute Ethical Committee. Male albino rats were anaesthetised with an intra-peritoneal injection of urethane. Tracheostomy was done to maintain the patency of airway. Femoral artery was cannulated proximally

as well as distally to record the blood pressure and to inject the chemicals, respectively.

Results: After intra-arterial injection of Mesobuthus tumulus venom, there was immediate hyperventilatory response followed by hypoventilatory response and finally a sustained hyperventilatory response was observed up to 60 min. The hypertensive response began after 40 s, peaking at 5 min which remained above the initial level subsequently. The bradycardiac response began after 5 min, peaking at 25 min which remained at that level up to 60 min. The responses were markedly attenuated after pretreatment with capsazepine ($P < 0.05$, two-way ANOVA). The ipsilateral nerve sectioning attenuated the BP and respiratory responses but not the HR ($P < 0.05$, two-way ANOVA). The lignocaine pretreatment also produced the same response as with the nerve sectioning.

Conclusion: .Our data suggest that the vanilloid receptor1 (VR1) and the afferents running through the ipsilateral somatic nerve are involved in mediating the vasosensory responses.

40PP

EFFECT OF PRANAYAMA ON CARDIOVASCULAR & RESPIRATORY SYSTEM – A PRE – POST STUDY

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Aims and Objectives: Yoga and pranayama are the ancient Indian life style practices which has no limits for age or gender. The main aim of this study is to evaluate the effect of pranayama on cardiovascular and respiratory system.

Materials and methods: This is a pre-post study which includes 50 healthy medical students of 18-25 years age group with equal male to female ratio. They act as their own control. They practised daily pranayama for 10 minutes; two hours post lunch for 12 weeks in clinical laboratory, Department of physiology, Prathima Medical College. Before and after 12 weeks their RR, HR, SBP & DBP were measured, and the results were compared.

Results: After 12 weeks of regular practise of pranayama, there is a significant reduction in RR ($P<0.01$) and HR, SBP, DBP ($P<0.05$) in both males and females.

Conclusion: These beneficial effects of pranayama along with regular diet and other exercise techniques can be useful in treating various lifestyle related diseases.

41PP

Cardiovascular response and serum IL-6 level in concentric and eccentric exercise

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Background and aim: Resistance exercise (RE) is strongly recommended for implementation in primary and secondary cardiovascular disease (CVD) prevention programs. Dynamic RE comprises of concentric (muscle shortening contractions) and eccentric (muscle lengthening contractions) phase. Exercise-induced increase in circulating IL-6 depends on exercise intensity, and it aids in the clearance of glucose and lipoproteins from circulation, improves insulin sensitivity and may prevent the initiation and development of CVD. The present study aims at measuring the cardiovascular response and serum IL-6 level in concentric exercise (CE) and eccentric exercise (EE).

Methods and materials: In this crossover study, 24 healthy, male adults from King George's Medical University Lucknow, aged 18-25 years, having BMI 18-23 kg/m^2, performed an acute bout of moderate intensity CE and EE on an inclined/declined treadmill and with dumbbells involving four major groups of muscle, for half an hour. Systolic blood pressure in mmHg (SBP), diastolic blood pressure in mmHg (DBP), heart rate per minute (HR), mean arterial pressure in mmHg (MAP) and serum Interleukin-6 level in pg/ml were measured just before and immediately after exercise.

Results: The change in SBP (CE:18.54±3.06, EE:13.38±1.72, p<.001*); HR (CE:57.21±10.73, EE:43.25±8.34, p<.001*); MAP (CE:8.35±1.40, EE:6.50±1.0, p<.001*); IL-6 (CE:5.40±3.13; EE:4.36±2.54, p=.01**); and DBP (CE:3.25±2.79, EE:3.08±1.89, p=.45**) were higher in CE. n=24, *paired-t test, ** Wilcoxon signed-rank test.

Conclusion: Both, CE and EE caused a significant increment in IL-6 level. EE produced a much less cardiovascular response as compared to CE. Hence, EE may be recommended for elderly, frail individuals or those at risk of CVD.

42PP

A cross sectional study comparing the variation of blood pressure in summer and winter months among the paramedical staff of gauhati medical college

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Background: Blood pressure generally is higher in the winter and lower in the summer. That's because low temperatures cause our blood vessels to narrow which increases blood pressure because more pressure is needed to force blood through our narrowed veins and arteries. Suggested etiology is that cold increases sympathetic tone, evidenced by elevated blood pressure and plasma and urinary noradrenalin concentrations. The lower blood pressure in warm temperatures is attributed to cutaneous vasodilatation and loss of water and salt from sweating.

Objectives: To study whether seasonal variation of temperature has got any effect on blood pressure.

Materials and methods: After getting approval from institutional ethical committee, 60 healthy normotensive male individuals were selected randomly from paramedical staff of Gauhati medical college. First blood pressure of each individual was measured in summer season by conventional method using mercury sphygmomanometer and stethoscope, and in winter on same individual. "p" value was obtained after doing data analysis by using GraphPad QuickCals software.

Results: Mean systolic BP was found as 119 ±10 and 118±9mm whereas Mean diastolic BP were found as 74±9 and 73±8mm of Hg in winter and summer season respectively. Values obtained in these two respective seasons were compared by paired t-test, revealing statistically significant (p=<0.05) difference both in systolic and diastolic BP.

Conclusion: As our study has revealed significant higher systolic and diastolic BP in winter season than in summer season so we can conclude that even if we find a borderline hypertensive subject in summer season we should recheck the BP of the subject in winter season to note any change in BP as we get higher BP in winter as compared to summers in the same individual.

43PP

Blood Pressure Variation during Cesarean Section

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Background: Blood Pressure (BP) fluctuates during different stages of normal labour. Data on variation of BP during cesarean section are scarce.

Objectives: Present study was carried out to determine the variation of BP during different stages of cesarean section to help in establishing better perinatal care towards achieving the goal of healthy mother and baby.

Material and methods: 100 cases of Cesarean section done under spinal anaesthesia in tertiary care center were evaluated. BP were recorded during premedication, after skin incision, after delivery of head of baby, after oxytocics injection, after delivery of baby, after delivery of placenta, after repair of uterus and after skin repair.

Results: Baseline mean Systolic (SBP) and diastolic blood pressure (DBP) are 117± 7.13 and 77.88 ± 5.66 mmHg. There are significant rise in SBP and DBP during premedication (129.29±5.15 & 86.56± 4.12 mmHg). SBP and DBP falls after syntocinon injection (112.76±6.50 & 72.42±4.05), after delivery of baby (112.76±6.50 &71.08±3.46) and after delivery of placenta (110.96±5.47 & 71.56±3.19 mmHg).

Conclusion: There is wide variation in BP during cesarean section. Close monitoring of BP during caesarean section may result in better perinatal outcome.

44PP

Measurement of blood pressure in two different sitting postures among healthy normotensive individuals (between 20-55 years) of Guwahati city

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Background: Blood pressure (BP) measurement is affected by various factors. Many studies have been undertaken regarding effects of different body postures, various levels of mercury sphygmomanometer etc on BP. Little information have been found regarding effect of two different sitting postures on BP measurement.

Objectives: To study whether two different sitting postures have got any effect on blood pressure measurement.

Materials and methods: After getting approval from institutional ethical committee, 100 healthy normotensive male individuals (between 20-55 years) were selected randomly from Guwahati city. At first BP of each individual was measured in sitting on a chair posture (conventional method) using mercury sphygmomanometer and stethoscope. After 5 minutes BP was measured in same individual in sitting on floor posture. “p” value was obtained after doing data analysis by using GraphPad software.

Results: Mean systolic BP in sitting on floor and sitting on chair postures were found as 127±11 and 121±11mm of Hg respectively. Mean diastolic BP were found as 82±7 and 75±7mm of Hg while sitting on floor and sitting on chair respectively. Values obtained in these two different sitting postures were compared by paired t-test, revealing statistically significant (p=<0.001) difference both in systolic and diastolic BP.

Conclusion: Study has revealed higher systolic and diastolic BP in sitting on floor posture compared to sitting on chair, so we can conclude that even if we measure BP of a patient while sitting on floor in an emergency situation we have to recheck it by conventional method (sitting on chair) for accuracy.

45PP

Study of variations in R-R interval in different individuals – A cross sectional study in the department of Physiology, Gauhati Medical College

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Background: Cardiovascular disorders are among the leading causes of morbidity and mortality around the world attributable to the sedentary lifestyle and inactivity of an individual. Variations in heart rate throughout the day within normal physiological limit can reflect the normal functioning of the heart. Thus, a study of variation in R-R interval in different individuals can be of help in modifying his lifestyle habits if ever needed.

Objectives: in an ambient condition, we aim to study age related effects on R-R interval in normal healthy individuals and the probable risk of cardiovascular diseases thereof.

Materials and methods: following approval from the ethical committee, 50 healthy individuals of age group 20 to 50 years were selected randomly from the staff of Gauhati Medical College. Informed consent and proper history were taken following which individual assessment of R-R interval was done via recording of ECG for 1 meter strip of 40 seconds time using bipolar limb lead II using 108TBPL ECG machine after making them to rest for 10 minutes in an ambient condition. Data analysis were done using Microsoft excel 2007.

Results: It was observed that there were variation in the R-R interval of different individuals and with the increasing age, the variations were of significance as correlated with the decrease in heart rate and prolongation of the R-R interval in older individuals within physiological limits with $p<0.05$.

Conclusion: Thus the study shows that there are variations in R-R intervals in different individuals and also with age these variations becomes more varied within the physiological limits; thus reflecting the condition of the heart as a whole.

46PP

ECG findings in Hypothyroidism

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Introduction: Since thyroid hormones are well-known molecules to influence metabolic activities, it is expected that they will have profound effect on ECG. A study done on 53 neonates with congenital hypothyroidism showed that hypothyroidism does not affect ECG findings of congenitally hypothyroid neonates. We have ventured here to study the effect of severe hypothyroidism on ECG findings in adults.

Aims and objectives: To study the effect of severe hypothyroidism on ECG findings in adults.

Materials and methods: We recorded the ECG of 30 screen-detected adults irrespective of sex diagnosed as severely hypothyroid (TSH>100µIU and/or FT4 < 0.06 ng/dl.) before levothyroxine (LT4) replacement therapy, and 15 age-matched normal adults for controls. Persons having known heart problems, diabetes mellitus or any other major problems were excluded.

Results and discussion: The severely hypothyroid patients showed that the mean HR in it was significantly low compared with the normal control group. However, all other values were within normal ranges, except that QTc in the severely hypothyroid group (0.414 ± 0.015, $p = 0.033$) was significantly shorter than in the control group (0.440 ± 0.052). No qualitative differences of P wave, QRS complex, and ST were noted between the two groups, though Right Bundle Branch Block was a bit higher in the hypothyroid group. All other ECG parameters were within normal ranges. HR positively correlated with FT4 and log (FT4), and negatively with TSH and log (TSH).

Conclusion: Hypothyroidism has effects on ECG though minor. A more elaborate study is required.

47PP

Correlation between blood pressure with sustained attention and psychomotor speed

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Background: Previous studies suggest that systolic blood pressure is associated with reduced levels of cognitive performance and increased cognitive decline. However there are no reports of correlation between blood pressure and digit vigilance task performance. Hence the present study was aimed to correlate between blood pressure and a task which require sustained attention and psychomotor speed.

Methods: The present study consisted of 20 healthy volunteers with ages ranged between 18 and 40 years (group mean±SD; 23.3±4.1years). Both genders of similar age were included in this study. Participants (i) having any diseases, (ii) taking any medication, and (iii) impaired cognitive performance were excluded. Signed informed consent of all participants was taken prior to the study and was approved by the Institutional Ethics Committee. Blood pressure of the participants was assessed using Schiller Truscope II (Guandong Biolight Meditech, China), and sustained attention and psychomotor speed were assessed using the digit vigilance test. Data were analyzed using Pearson correlation with SPSS version 18.0.

Result: In this study, systolic and diastolic blood pressure were negatively correlated with time taken and error in Digit vigilance task. However the results were not significant ($p>0.05$).

Conclusion: There was an insignificant negative correlation between blood pressure and a cognitive task which involves sustain attention and psychomotor speed. Perhaps a larger sample size would demonstrate the effects more clearly.

48PP

Correlation study between heart rate variability with state anxiety and hyperventilation in outpatients

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Background: Anxiety disorders were found to be associated with reduced HRV. Hence the present study was aimed to assess the correlation between HRV and (i) state anxiety and (ii) subjectively rated hyperventilation in outpatients at a yoga and *ayurveda* hospital.

Material and Methods: Thirty four participants who came as outpatients in a yoga and ayurveda hospital, with ages ranging between 17 to 76 years (group mean age ±SD, 38.7±14.9 years) were recruited for the study. Signed informed consent of all participants was taken prior to the study and was approved by the Institutional Ethics Committee. HRV was assessed using a two channel ECG and respiration recording system (MP45 Biopac system lab, Biopac System Inc, U.S.A.), state anxiety was assessed using state and trait anxiety inventory (STAI), and hyperventilation using Nijmegen SPELLING self evaluation discomfort questionnaire. HRV data was extracted using standard methods. Pearson correlation was performed using PASW (SPSS version 18) to compare HRV with state anxiety and hyperventilation.

Result: NN50 was significantly positive correlated with hyperventilation ($p<0.05$) and State anxiety was not found correlated with HRV ($p>0.05$).

Conclusion: Different breathing patterns modify autonomic nervous system.

49PP

A Correlation between Heart Rate Variability (HRV) and somatization of stress

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Background: HRV has shown a significant relationship with trauma symptoms and psychological distress, but no direct relation has been found between HRV and somatization of stress. Hence the present study was aimed to assess the correlation between HRV and somatization of stress.

Material and Methods: Twenty healthy participants with ages ranging between 17 to 35 years (group mean age±SD, 26.4 5.5 years) were recruited for the study. They were staying in the north region of the India. Participants with good health condition were included and those who were taking any medication, or suffering with any chronic illness were excluded from the study. Signed informed consent of all participants was taken prior to the study and was approved by the Institutional Ethics Committee. HRV was assessed using a two channel ECG (MP 45 Biopac Student Lab, BIOPAC System Inc, U.S.A.), and somatization of stress was assessed using SCL 90-R. HRV data were extracted by using standard method. Pearson correlation was performed using PASW (SPSS version 18) to correlate HRV values with somatization of stress.

Result: The LF/HF values showed a negative correlation with somatization of stress ($p<0.05$).

Conclusion: The results are difficult to interpret. Generally higher sympathetic levels (usually, but not entirely, associated with LF values) should positively correlate with somatization of stress. The incongruent findings may suggest that subjective and objective measures do not always bear a direct relationship to each other. A larger sample is needed for conclusions.

50PP

Evaluation of Heart rate recovery in lean polycystic ovarian syndrome phenotype

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Background: Polycystic ovarian syndrome (PCOS), a common reproductive disorder, is associated with blunted heart rate response to exercise. We assessed Heart rate recovery (HRR) to exercise challenge in PCOS patients and healthy controls.

Materials and methods: We evaluated 29 PCOS patients and 32 controls. BMI was estimated using weight and height. Baseline heart rate was recorded after 10 minutes of rest. Ergometer exercise was performed in both groups for 6 minutes at 50-85% of target heart rate. A cool down period of 20 minutes was given after the exercise. Lead II ECG was recorded throughout. Peak heart rate was recorded during exercise. Heart rate recovery (HRR) was calculated at 1st minute, 5th minute and 20th minute and compared in both groups.

Results: BMI values were normal and comparable between the controls and cases (20.94 ± 2.9 and 22.33 ± 4.67 kg/m2, p=0.18). Baseline heart rate was comparable between the groups (83.9 ± 9.5 and 83.3 ± 13.9 per minute, p=0.87). There was no significant difference between HRR at 1st minute, 5th minute and 20th minute (20 (19.0 – 29.0) and 27 (19.5 – 35.75), p=0.12, 37 (33.5 - 45) and 42 (35.25 – 47.75), p=0.15 and 41 (36 – 47.5) and 45.5 (38.25 – 53.5), p=0.45 respectively).

Conclusion: Both the groups had normal BMI and the baseline heart rate and HRR were also comparable. Newly diagnosed lean phenotype PCOS patients did not display typical blunted recovery pattern. Our findings confirm the significant role of

obesity in the pathogenesis of cardiovascular dysfunction associated with PCOS.

51PP

Vascular and Endothelial dysfunction in MI Patients: The role of infarct location

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Background: Increased arterial stiffness is a surrogate indicator of left ventricular systolic loading. Endothelial dysfunction by altered vascular reactivity negatively influences the myocardial perfusion contributing to Myocardial Infarction (MI). We assessed the relationship of vascular and endothelial functions to infarct location in MI patients from the ongoing Yoga CaRe trial.

Methods: Patients with MI were grouped into those with anterior MI (n=29, age = 48.24 ± 9.94) and inferior MI (n=22, age = 52.55 ± 8.87). Arterial stiffness assessment was done by recording carotid-femoral Pulse Wave Velocity (cf-PWV) and Augmentation Index (AI_x®Endothelial function was assessed by brachial artery Flow Mediated Dilation (FMD) using B-mode ultrasound. All recordings were done in the Autonomic & Vascular function lab, Department of Physiology at AIIMS, New Delhi at 3rd week post MI. @75) using SphygmoCor.

Results: The FMD was significantly lower in inferior MI group as compared to anterior MI group (8.40 ± 4.61% vs. 11.15 ± 3.74%, p = 0.02). Both Carotid-femoral PWV (cf-PWV) and Augmentation Index (AI_xinferior MI group as compared to anterior MI group (9.96 ± 2.82m/sec vs. 7.97 ± 1.37m/sec, p = 0.009 and 23.90 ± 6.64% vs. 18.07 ± 10.82%, p = 0.03 respectively). On multiple regression analysis, after adjustment for age, BP and BMI there was significant difference between both the groups in FMD (p = 0.04), Carotid-femoral PWV (cf-PWV) (p = 0.03) and Augmentation Index (AI_x. @75) were significantly higher in @75) (p = 0.03)

Conclusion: We report that inferior wall MI patients have both increased arterial stiffness and endothelial dysfunction than anterior wall MI patients. Considering these as markers of vascular health, one may expect less adverse event in inferior wall MI. However that is not true in clinical observation. Further studies are required to clarify this discrepancy.

52 PP

Effect of Angiotensin Converting Enzyme Inhibitor on Arterial stiffness in Type 2 Diabetes with newly Diagnosed Hypertension

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Background: Diabetes is associated with impaired cardiovascular function and is often accompanied by hypertension. Angiotensin Converting Enzyme (ACE) inhibitors are commonly used in the treatment of hypertension. Increased arterial stiffness is known to be associated with diabetes and is an independent risk factor for cardiovascular diseases. The present study aims to investigate the acute effect of ACE inhibitor on arterial stiffness in type 2 diabetics with newly diagnosed hypertension.

Methods: Diabetics with newly diagnosed hypertension were recruited for the study (n=45) with mean age 47±6.5 years. Arterial stiffness was assessed using Augmentation index (AIx@75) and Pulse Wave Velocity (PWV) [carotid-radial (cr) and carotid-distal (cd)] by applanation tonometry using

Sphygmocor@. All recordings were done at baseline and after 1 week of ACE inhibitor treatment in Autonomic and vascular lab, Dept. of Physiology, AIIMS, New Delhi.

Results: Both systolic and diastolic blood pressure reduced significantly after ACE inhibition ($p<0.0001$). AIx@75 was significantly lower after 1 week as compared to baseline (24.7±9.3 Vs 19.9±9.9%, p= 0.0001). cd PWV also decreased significantly (10.2±1.4 Vs 9.3±1.5 m/s, p=0.018) after 1 week of ACE inhibitor treatment. However, the decrease in crPWV after ACE inhibition was not significant (9.2±1.6 Vs 8.4±1.5m/s, p= 0.06). Multiple regression analysis was done using the arterial stiffness parameters as dependent variables and SBP, DBP and pulse pressure as the independent variables. cd PWV remained significantly different (p =0.02, r2 =29.9) even after correcting for the blood pressure variables.

Conclusion: The change in Augmentation index and carotid-distal PWV might be probably because of vasorelaxation effect of ACE inhibitors in patients of diabetes with newly diagnosed hypertension.

53 PP

Heart rate variability as a measure of exercise recovery in normal adult subjects

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Background: Heart rate variability (HRV) has been used as important noninvasive tool in evaluation of autonomic function while performing exercise as well as post-exercise recovery period. In healthy individuals some studies reported parasympathetic reactivation during early recovery after exercise however others found persistence of sympathetic dominance.

Objective: Therefore aim of our study was to evaluate time & frequency domain parameters of HRV during post-exercise recovery in young healthy adult males.

Material and Method: 32 untrained young healthy adult males of age 18-25 years with normal BMI were included in the study. ECG was recorded in lead II and HRV was calculated during rest. Subjects were asked to perform standard Harvard Step Test and recovery period HRV was also calculated till 9 minutes. Recovery period was divided in 1-3mins, 4-6mins and 7-9mins for differentiating early recovery from mid and late recovery.

Results: Significantly decreased time domain parameters, i.e. RMSSD (from 44.44±17.7 to 25±33.33) and pNN50 (from 29.34±19.77 to 1.34±1.87) by the end of 9 minutes was observed indicating reduced parasympathetic influence. Whereas, LFnu and LF/HF ratio increased from 0.70±0.48 to 4.16±4.68, and 36.64±13.54 to 64.73±28.88 respectively which point towards sympathetic predominance till 9 minutes of recovery. Also HFnu was decreased significantly from 60.23±11.95 to 32.88±24.32 during recovery period.

Conclusion: Absence of parasympathetic reactivation and high sympathetic response during post exercise recovery till 9 minutes corroborate delayed recovery in these subjects who are untrained. Besides, it also necessitates the need to interpret post-exercise recovery of untrained subjects differently. Only heart rate recovery may not be sufficient and interpretation in terms of HRV changes should be an added consideration.

54 PP

Comparative Study Of Heart Rate Variability In Normotensive And Hypertensive Individuals.

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Background: Hypertension is the most prevalent cardiovascular disorder that affects many organs of

our body .Heart rate variability (HRV) is a simple, sensitive and non-invasive tool to monitor the cardiovascular function .The present study is for assessment of sympathovagal balance by analysing HRV in hypertensive individuals.

Objectives: To analyse Heart Rate Variability (HRV) in normotensive and hypertensive individuals.

Material and methods: 30 hypertensive and 30 normotensive subjects between the age group of 30-60 years were selected. Lead-II ECG was recorded using instrument PHYSIOPAC-PP4, MEDICAID system,Chandigarh and HRV analysis was done using KUBIOS HRV analyser. Spectral indices of HRV based on frequency domain such as normalized low frequency power (LFnu), normalized high frequency power (HFnu), ratio of low frequency power to high frequency power (LF-HF ratio) and time domain such as 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 LFnu (78.17±5.73) and LF-HF ratio(2.14±0.24) was significantly increased in hypertensives and significant decrease was seen in HFnu (37.13±3.70), SDNN (149.1±4.82), rMSSD (36.4±4.75)and pNN50 (9.97±1.90) in hypertensives by student's paired t- test .

Conclusion-Above result suggests increased sympathetic and decreased parasympathetic activity. The pathophysiology of hypertension is primarily due to an increase systemic vascular resistance. This is attributed to enhanced sympathetic activity leading to sympathovagal imbalance.

55PP

Assessment of cardiac autonomic tone during the course of healthy pregnancy

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Introduction: Pregnancy is associated with changes in the cardiovascular responses which may modulate the cardiac autonomic tone. To determine these changes, this study was done to assess the heart rate variability (HRV), which is an important index of the cardiac autonomic drive.

Methods: Healthy pregnant women (n=70) were recruited in their first trimester and followed up till delivery. Lead II ECG was recorded at three time points i.e. V1 (11-13+5weeks), V2 (20- 22+5weeks), and V3 (30-32+5weeks). Heart rate variability (HRV) analysis was done in time and frequency domain. Friedman test with Dunn's post hoc test was used for statistical analysis.

Results: Time domain indices; SDNN, SDSD and pNN50 were significantly reduced in the second and third trimesters when compared to the first trimester [V1 vs V2 and V3, 40.8(27.1- 52.7) vs 33.13(22.7-41.9) and 27.0(22.5-40.6) $p<0.001$, 39.0(23.6-51.0) vs 21.4(14.2-38.5) and 17.9(12.0-27.7) $p<0.0001$), 6.3(1.6-16.7) vs 1.6(0.2-9.4) and 0.4(0.0-2.5) $p<0.0001$) respectively]. Similar results were seen in frequency domain analysis where LF (sympathetic) and HF (parasympathetic) decreased from the first trimester to the third trimester of pregnancy, which manifests as a reduction in the total power. In addition LF/HF ratio showed a significant increase during the 2nd trimester.

Conclusion: These results suggest that in healthy women, sympatho-vagal balance shifts towards a sympathetic predominance during mid-pregnancy while the overall heart rate variability decreases during the course of pregnancy.

56PP

Blood Pressure fluctuations induced by using Oscillatory Lower Body Negative Pressure.

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Introduction: Heart rate and Blood pressure oscillations interact with each other through direct feed forward and baroreflex mediated feedback loops. Nature of these interactions has been largely studied through quantification of spontaneous oscillations in these variables. Techniques or maneuvers that can artificially induce oscillations in blood pressure at a desired frequency could be employed to study circulatory homeostasis in a more controlled manner. The objective of the study was to induce oscillations in arterial blood pressure at different frequencies by using Lower Body Negative Pressure (LBNP) device.

Material and Methods: The study was conducted on 12 healthy subjects aged 27.67 ± 4.43 years. LBNP device was used to induce oscillations in mean BP by the magnitude of 5-8 mmHg at six different frequencies {0.03Hz, 0.05Hz, 0.07Hz, 0.1Hz, 0.16Hz, and 0.25Hz). Beat-to-beat blood pressure was recorded by using non-invasive BP recorder (Portapres).

Results: The power spectral density (PSD) of mean BP at each desired frequency was increased significantly as compare to PSD of that frequency in baseline except 0.16Hz and percentage of change in mean BP power spectral density was high at 0.05Hz and 0.07Hz.

Conclusion: These observations suggest that oscillating LBNP can artificially induce oscillations in blood pressure at a broader range of frequencies and can potentially be utilized as a promising tool in cardiovascular research.

57PP

Cardiovascular dysfunction in tobacco chewers of Haryana

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Background: Smokeless tobacco affects the cardiovascular system and causes diseases like, myocardial infarction, stroke, and high blood pressure. Nicotine in tobacco is found to alter the cardiovascular autonomic functions. We studied the effect of tobacco chewing on cardiovascular autonomic function by using the short term heart rate variability (HRV) analysis.

Methodology: A total of 60 adult males were included in the study who were grouped as 30 tobacco chewers (test group) and tobacco nonusers (controls). The subjects were asked to refrain from tobacco use overnight. They were asked to lie down on the table and to relax. The ECG electrodes were attached to left arm, right arm and left leg and basal ECG (Lead II) was taken for 5 minutes using Digitalized ***Powerlab26T Polyrite D.*** The frequency domain parameters (VLF, LF, HF, and LF/HF) were derived and analyzed automatically. **Unpaired 't'** test was used for comparison and statistical significance was set at $p<0.05$.

Results: A highly significant ($p<0.001$) decrease in VLF, LF and HF parameters was seen in chewers. LF denotes both sympathetic and parasympathetic activity and HF reflects parasympathetic (vagal) influence on heart. We found significant ($p<0.05$) increase in LF/HF ratio. The LF/HF ratio is used to indicate balance between sympathetic and parasympathetic tone. An increase in this ratio indicates decreased parasympathetic activity.

Statistically insignificant increase in heart rate was also observed.

Conclusion: HRV analysis in tobacco chewers has revealed the disturbances in cardiac autonomic regulation, predisposing the subjects to various cardiovascular diseases. Thereby adequate measures should be taken to discourage its use.

58PP

Prevalence of Prehypertension in young adults in Navi Mumbai

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Background: The Prevalence of Prehypertension is increasing in the developing countries and developed countries. According to 7th Joint National Committee (JNC7), "Prehypertension," defined as a systolic blood pressure (SBP) of 120 to139 mm Hg and/or a diastolic blood pressure (DBP) of 80 to 89 mm Hg. These diseases are associated with an increased risk of cardiovascular disease (CVD) and represent the single greatest preventable cause of death in humans.

Objectives: The study was done to determine the prevalence of Prehypertension in young adults.

Material and Methods: The study include 100 Volunteers,(50 male and 50 female) with age range between 18-25 years. Three Group were made (Normal, overweight, and obese) depending on BMI. The SBP, DBP were recorded and mean arterial BP was calculated. The study has been approved by Institutional ethical committee.

Results: Out of 100 subjects, the overall prevalence of systolic Prehypertension 30% and diastolic 16%.The prevalence of Prehypertension in different groups was in Underweight group 12.5% Systolic and 0% diastolic BP, in Normal weight group 7.69% systolic and 5.12% diastolic BP, in Over weight group 41.67% systolic and 33.33% diastolic BP, in Obese group 39% systolic and 21.95% diastolic BP respectively.

Conclusion: Our results showed that Prehypertension is very common in young adults. We found that overweight and obesity had the strongest association with Prehypertension. this alert us about possible cardiovascular risks and precautions to be taken before it becomes too late.

59PP

Study of Functional Arterial Stiffness For Correlation Between Pulse Volume and Age in Normal Subject

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Background: arterial wall thickness occurs with age in human and is a strong predictor of cardiovascular disease risk.Age-related increase in arterial wall thickness is observed in the absence of atheriosclerosis and hypertension.Pulse volume refers to the movement of the vessel wall during the passage of the pulse wave and the stroke volume of the ventricles.Therefore in the present study we studied the changes in arterial pulse volume with age.

Objective: Interested relationship between arterial stiffness and cardiovascular disease.As changes can be detected before the appearance of clinically apparent vascular disease,arterial stiffness may act either as a marker for the development of future atherosclerotic disease .

Material And Methods: The study was conducted on 40 volunteers from general population having no apparent disease.The subjects were divided in to

two groups:Group-I and Group- II.The pulse volume was recorded by pulse transducer and student physiograph(inco ambala,india).Normal arterial pulse was recorded and the rate rhythym and average amplitude for one minute were calculated. Ratio of averaged Pulse amplitude and mean arterial pressure of each subject was also calculated.

Result: The mean age (years)of subjects in group-I was lower(19.30±1.25) as compared to group-II(61.60±5.91)(p<0.001).The important finding of our study was the pulse amplitude(mm)(which represent the pulse volume)was significantly lower (7.24±1.36) in group II as compared to group I(19.10±6.87).we also calculated the ratio of pulse amplitude and mean arterial pressure which was significantly lower in group II as compared to group I.

Conclusion: our data suggests that the pulse transducer and physiograph can easily record the pulse volume index and asses the cardiovascular risk.

60PP

Effectiveness of Early Clinical Exposure in Learning Respiratory Physiology among the newly entrant MBBS students.

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Introduction: Early Clinical Exposure has been conceptualized to orient medical students towards actual clinical scenario and help them correlate their theoretical knowledge with real life situations in early years of MBBS course. In present study we explored the outcome of early clinical exposure in the context of basic science topics (Physiology) in fresh MBBS entrants and compared their performance with conventionally taught control group.

Methods: Voluntarily participating 150 students of 1st year MBBS (2015-16) batch were included and divided into two groups by permuted block randomization.They were evaluated by MCQ (Multiple Choice Question) and OSCE (Objective Structured Clinical Examination) before and after being taught about a basic Physiology topic (respiratory system) theoretically. Study group was undergone clinical exposure in addition before post-test while control group was not. Performance of the students was compared in between two groups by unpaired Student's t- test whereas marks of pre and post-test within same group were compared by paired Students t – test. Everywhere p<0.05 was considered to be significant.

Results: Marks of individual group in pre and post-tests differed significantly (P< 0.05 in each case). Post-test marks were significantly greater in each group though the level of improvement was strikingly higher in study group (p=0.01). Though there was no significant difference in pre -test marks of both groups (P=0.73), post- test marks were significantly higher in study group (P=0.04). Among the exposed students, majority (92%) opined that ECE is a better technique being practically oriented and more interesting while some (8%) found it to be more time and energy consuming, suitable for selective portions of basic science topics.

Conclusion: Early Clinical Exposure may be an effective technique to supplement the traditional theoretical teaching to improve the performance of fresh medical entrants in Physiology. It has better acceptability by the students and may be considered for inclusion in the existing pre-clinical curriculum with proper allocation of time and man power.

61PP

Does awareness of learning styles and modifications in study modalities lead to changes in learning outcomes among first MBBS students?

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Background: Different students have different learning styles. If students are made aware of their learning styles, their performance may improve. Understanding students' learning style preference is therefore an important consideration for an effective teaching and learning process.

Objectives: To find out learning style of students and to study impact of preferred learning style on learning outcome.

Materials and Methods: VARK questionnaire (version 7.8 with 16 items) was administered to 88 first MBBS students to know their learning styles. Pre-test in the form of multiple choice questions was carried out in all students. Students were made aware of their learning style by the facilitators and ways to realign their study modalities to their preferred learning style were discussed. Reinforcement sessions were conducted every two weeks such three sessions were conducted. Post-test was carried out after eight weeks. Pre-test and post-test results were compared using Student's paired't' test.

Results: Number of students according to their preferred learning style are as follows: Multimodal (using more than one learning styles) - 38, Unimodal: visual-18, auditory-22, Read/Write-17, Kinesthetic-05. After students realigned their study strategies, post test scores improved in 51% students.

Conclusion: Multimodal learning style was preferred by more students than any of the unimodal styles. Improvement in post-test scores suggests that awareness of own learning style and relevant changes in study modalities leads to improvement in learning experience and performance of the students.

62PP

A Study of Relationship of Rheumatic Heart Disease to Blood Group (ABO) In Muzaffarpur City

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Background: Available evidence suggests that rheumatic fever and RHD results when a dexterous environment challenges susceptible **genotypes** different disease, cancer **(in our study ABO system)**. Also the major functional component of pathogenesis is mediated by the immune system**,** under genetic control. Here the study is taken(area specific) to define relationship of ABO blood group to RHD, whether it is associated to particular group in **Muzaffarpur city**, this can also answer the association being used as genetic marker for determining host susceptibility to RHD.

Materials and method: In order to establish possible relationship between ABO blood group and rheumatic heart disease, 120 cases of clinical determined rheumatic fever and rheumatic heart disease were analyzed and their blood group compared with ABO blood group of 2500 cases which served as control.

Result: The outstanding differences in the incidence of Rheumatic heart disease in blood group 'B' and 'A' was found to be statistically significant. The disease was found more common in poor patients and also the incidence more in group 'A' and relatively less in group 'O'. Other predisposing factor like age, incidence of first attack of rheumatic fever was also studied in relation of ABO blood group and found similar increase in blood group 'A' and decrease in blood group 'O'.

Conclusion: It is concluded therefore that, group 'A' individual are more susceptible to rheumatic heart disease while group 'O' individuals are relatively resistant to the disease. Implication: Association may be used as genetic marker for determining host susceptibility to RHD.

63PP

Evaluation of Anthropometric parameters, Systolic blood pressure and hs-CRP in lean Polycystic Ovarian Syndrome patients

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Background: Polycystic ovarian syndrome (PCOS) is the most common endocrine disorder amongst women of reproductive age. hsCRP is an important predictor of future risk of cardiovascular disease. We evaluated anthropometric parameters, blood pressure and hsCRP in newly diagnosed PCOS patients and healthy controls.

Materials and methods: We included 34 newly diagnosed PCOS patients and 32 controls. BMI was calculated using Height and weight and BSA was estimated using DuBois normogram. Waist-hip ratio(WHR) was calculated as the ratio of Waist Circumference to Hip Circumference. hsCRP was estimated using sandwich ELISA technique.

Results: Height of controls was significantly higher than patients (160.03±6.47 and 155.21 ± 6.95 cm, p=0.003), while weight was comparable (54 (48.2 – 62) and 52 (45 – 62.5) kg, p=0.43). There was no significant difference between BMI and BSA between the groups (21.72 (19.01 – 24.23) and 21.58(18.96-25.87) kg/m^2, p=0.58 and 1.54 (1.47 – 1.63) and 1.49 (1.4 – 1.59) m^2, p=0.11 respectively). Waist hip ratio was found to be significantly higher in cases compared to controls (p=0.03). hsCRP was significantly higher in cases when compared to controls (4.45 (1.98 – 10.03) and 1.95(0.75 – 4.675) mg/ml, p=0.03). Resting systolic blood pressure was higher in cases (p = 0.044)

Conclusions: Our results demonstrate elevated hsCRP levels, greater WHR and higher resting SBP in newly diagnosed PCOS patients with normal BMI. Higher SBP and hsCRP levels are pointers of increased cardiovascular risk. Hence, we advocate inclusion of hsCRP and WHR in diagnostic protocol of PCOS as accurate predictors of occurrence of future cardiovascular events.

64PP

Visceral and subcutaneous abdominal fat in relation to Thyroid Stimulating Hormone (TSH) level in Eu-thyroid female subjects

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Background & Objective: Central or abdominal obesity has been shown to be an important predictor of thyroid hormone parameters. However, it is still unclear whether the visceral (intra-abdominal) or the subcutaneous component of abdominal fat is more deleterious for the altered thyroid hormone parameters. The objective of the study is to depict the role of visceral and subcutaneous fat on TSH level of eu-thyroid female.

Design: Cross-sectional study

Method: 103 Eu-thyroid female (TSH level within 0.4µIU/ml-3µIU/ml) with an average age range of (31.72±11.8 yrs) with no significant clinical abnormalities were included in this study. Visceral

and Subcutaneous fat was measured by ultrasonography with the patient in supine position using a 3.75 MHz probe located 1 cm above the umbilicus on the xipho-umbilical line.

Result: Visceral fat showed significant association with TSH level (r=0.375. p=0.000, 95% CI). Linear regression analysis revealed that visceral fat has significant positive association (B=0.742. p=0.000, 95% CI 0.342-1.143) and Subcutaneous fat has negative association (B=-0.039, p=0.908, 95% CI -0.718-0.639) with serum TSH level.

Conclusion: Visceral Fat has strong positive association with TSH whereas subcutaneous fat is negatively associated with TSH in eu-thyroid female subjects.

65PP

Duration of Lactational amenorrhea in relation to their BMI status – A prospective study in women attending GMCH

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Background: Even today, breast-feeding still prevents more pregnancies than all modern forms of contraception in many developing countries. The benefits of breast feeding for Infant health are universally recognized, however, many people are skeptical about the use of breast-feeding as a family planning method. To execute this method for family planning method factors like BMI which presumably shows relation with duration of Lactational amenorrhea should be studied. Available data from developing and developed countries indicate the Lactational amenorrhea is shorter among well nourished and socio- economically better off segments of the population.

Objective: To determine median duration of resumption of menstruation post partum in lactating women in relation to their BMI category.

Methods: Prospective study design involving 50 women from each BMI groups categorized as underweight, normal weight, overweight, obese who had delivered normal full term infants for reference period of 12 months. Those suffering from major systemic diseases and or on other family planning methods were excluded. The median duration of lactation amenorrhea was determined. The relation between duration of Lactational amenorrhea and BMI was analyzed by Chi square test and multiple logistic regression analysis using Graph pad Instat.

Results: The median duration Lactational amenorrhea was observed to be 8.12 months. The amenorrhea status was significantly related to breast feeding & exclusive breast feeding (P<0.05) while it was not strongly related to the BMI status of the mother.

Conclusion: Contraceptive campaigns may be delayed up to 6months post partum irrespective of BMI status of women.

66PP

Thyroid hormone levels in Preeclamptic patients: a hospital based study

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Background: Several studies from different parts of India reported increased TSH in preeclampsia and variable Free T3 and Free T4 levels. This study aims to measure thyroid hormones level in preeclampsia in a hospital based study in Manipur

Methods: This cross sectional study included 30 diagnosed case of preeclampsia and 30 healthy normotensive pregnant women in the age group of 19- 40 years and > 20 weeks gestation. Blood sample were collected and thyroid hormone assay was done by ELISA. Descriptive statistics such as mean and SD were used. Comparison between pre-eclamptic group with normal group was done by unpaired t-test. A *p*-value less than 0.05 was considered as significant.

Results: The TSH level in preeclamptic patients were significantly higher (n=30; 5.86 ± 2.10 mIU/L) as compared to that of controls (n=30, 1.92 ± 0.82 mIU/L) (p=0.000). There was no statistically significant differences in the FT4 and FT3 level between the preeclamptic and normal pregnancy (n=30; 1.16 ± 0.33ng/dl, n=30; 1.00 ± 0.39 ng/dl) (p=0.38), (n=30; 1.98 ± .46 pg/ml, n=30; 2.15 ± .67 pg/ml) (p=0.11)

Conclusion: The mean TSH value in the study group were significantly higher statistically and a non significant alteration is seen in FT4 and FT3 level. This suggests the role of thyroid hormones in the development and pathogenesis of preeclampsia. Therefore, early detection of thyroid abnormalities may help in better management of the disease in established preeclamptic women.

67PP

Effect of Subclinical Hypothyroidism On Electrophysiological Parameters Of Peripheral Nerve

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Background: Subclinical hypothyroidism represents mild thyroid failure is an oligosymptomatic or asymptomatic condition with elevated serum TSH (>5µIU/mL) with concomitant normal serum free thyroxin (T4) and triiodothyronine (T3) concentrations. It is the most prevalent thyroid disorder affecting 3-15% of the adult population with higher incidence in female. Oftenly reported having dry skin, muscle weakness, fatigue, muscle cramps, weight gain, menorrhagia (female patients). Most of the neuropathy remains latent in the early phase of disorder. This latent subclinical neuropathy can be investigated using Electroneuromyogram.

Objectives: The present study was planned to observe any changes in electrophysiological parameters of sensory and motor component of median and ulnar nerves of both limbs in subclinical hypothyroidism patients.

Methods: The study was conducted on 120 subjects aged 18-45 years old, out of which 60 cases of biochemically diagnosed subclinical hypothyroidism and 60 healthy age and sex matched controls were taken. Electrophysiological parameters of MNCV (Motor nerve conduction velocity) and SNCV (Sensory nerve conduction velocity) of Median and Ulnar nerve was performed in both limbs in cases and controls by using Medicaid Neurostim Equipment according to international guidelines. Data was statistically analyzed by unpaired t-test using graph pad prism software.

Results: There is significant increase in the latency of sensory(p value 0.02) and motor (p value 0.014) component of right and left median nerve and significant decrease in amplitude(p value 0.03) of sensory component of right median nerve as well as Significant decrease in SNCV (p value 0.03) (both arm) and MNCV (p value 0.0001) (left arm) . Increase in latency (p value 0.02) of both sensory and motor part and decrease in amplitude(p value 0.01) of motor part, SNCV(p value 0.0009) of right and left ulnar nerve.

Conclusion: Even before emergence of neurological symptoms in patients with subclinical Hypothyroidism abnormalities can be detected in Nerve Conduction Studies; which may contribute to early diagnosis and treatment.

68PP

Hypoglycemia in low birth weight newborns and the need of screening of blood glucose in them.

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Background : Neonatal Hypoglycemia is one of the most common metabolic problems seen in newborns. Overall prevalence depends upon birth weight, gestational age and intrauterine growth retardation.

Objectives : With this experiment we aimed to investigate the incidence of hypoglycemia in LBW newborns and the relevance of screening tests in them.

Material and methods: This study was done on 50 LBW newborns. Screening of blood glucose level was done within 24 hours of their birth using glucometer strips of accucheck company According to WHO criteria, newborns having birth weight of ≤ 2.5 Kg are termed as LBW. Babies having blood glucose level of 40 mg/dl or less, irrespective of period of gestation, if associate with symptoms of hypoglycemia or if on repeat analysis in asymptomatic babies, were included under hypoglycemic babies.

Results: It was observed that out of 50 newborns, 15 had sugar level below 40 mg/dl, incidence being 30%.

Conclusion: Prolonged hypoglycemia can lead to permanent brain injury causing cognitive impairment, cerebral palsy and other sequelae. These can be avoided by using screening tests. However WHO recommends that neonatal blood glucose screening be reserved for at risk or symptomatic newborns. Screening all the newborns is unnecessary and potentially harmful. Incidence being high in LBW newborns, it is widely recommended to do screening test in them. But still there is a need for establishing a cut off value of glucose for diagnosing hypoglycemia using screening tests.

69PP

Glycaemic profile of geriatric and non-geriatric diabetic patients-a hospital based study

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Background: Diabetes in elderly is metabolically distinct from diabetes in younger patients. The clinical presentation and complications are usually not classical and co-morbid conditions are also different in geriatric age group. This calls for an approach which is well tailored for them.

Objective: To compare the profile of glycaemic control in geriatric (>60 years) and non- geriatric (>60 years) diabetic patients.

Material and method: A cross sectional, hospital based study was performed during February 2016 and July 2016 in a tertiary care hospital in Sikkim after obtaining the clearance from Institutional ethical committee (SMU). All patients diagnosed with Diabetes Mellitus according to ADA criteria, attending OPD and admitted as in- patient were included in the study. Patient's information were collected in a pro forma. Complete clinical examination was done. Lab Investigations like Fasting blood sugar, postprandial blood sugar and Glycosylated haemoglobin. Data regarding glycaemic profile was analysed using chi square test and data represented in tables.

Result: A total of 150 diabetic patients participated in the study out of which 106 were non geriatric and 44 were geriatric patients. In the geriatric age group 18 were males and 26 were females whereas in the non-geriatric group, 55 were males and 51 were females. In the present study, (taking $p < .05$ as

significant) no significant difference was found between the glycaemic profile of geriatric and non-geriatric patients - FBS (p value = 0.9018), PPBS (p= 0.8876), HbA1c (p= 0.2450).

Conclusion: The difference in the glycaemic profile of geriatric and non-geriatric diabetic patients could not be established. However, difference of other clinical profiles need to be studied. Bigger sample size and community based studies would be more beneficial in appreciating the difference between the two groups.

70PP

Evaluation of Renin Angiotensin System in Developing Lungs: A Therapeutic Implication

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Purpose: Developing lungs in the prematurely born infants can be affected by over expressing Renin angiotensin system (RAS). The present study was carried out to evaluate the effect of RAS system in hyperoxia treated neonatal rat pups.

Method: Hyperoxia insult to developing lungs was induced in neonatal Wistar rat pups. Pups were randomized into test group i.e. lisinopril and telmisartan, positive control- bevacizumab and disease control (DC). Test drugs were injected through intradermal route in two divided doses, 48 hours apart at PD12. Rat pups were sacrificed and lungs were extracted to study the gene expression of RAS components and angiogenic cytokines in all the test groups. The lungs were also subjected for histopathological examination. The drug concentrations were also analyzed in plasma and lungs using LC-MS/MS.

Results: The RAS components were significantly up regulated in the disease control lung as compared to the room air raised group. Expression of RAS components of various groups was also altered. Histopathological examination revealed thickening of alveoli in the DC group as compared to normoxia group whereas the normal morphology was observed in the treatment groups comparable to normoxia group. The concentration of drugs reached significantly to inhibit/block the renin angiotensin system in lungs.

Conclusion: For the first time this study showed that over expressing RAS can cause lung disorder in prematurely born infants. Modulation of this system can preserve the normal morphology and development of lungs.

Acknowledgment: We acknowledge grant from DST for carrying out this research work

71PP

Lipid Profile abnormalities in Type 2 Diabetes among the population of Manipur at RIMS, Imphal.

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Background: Dyslipideamia is one of the common disorders seen in Type 2 diabetic patients which cause cardiovascular diseases. Previous studies on lipid profile among Type 2 diabetes reported variables results. Therefore we would like to study the lipid profile abnormalities in type 2 Diabetes among the population of Manipur. **Objectives**: To evaluate the serum lipid abnormalities in patients with type 2 diabetes mellitus and variability in gender if any.

Material and Methods: A total of 140 participants were included in the study. Seventy known type 2 diabetic patients in the age group 35 -75 years were

selected randomly from the diabetic clinic RIMS, Imphal and another seventy non diabetic individuals of same age group were taken as control. Serum total cholesterol, triglycerides, high-density lipoprotein cholesterol (HDL-C) and low-density lipoprotein cholesterol (LDL-C) were estimated by enzymatic colorimetric method. Data were analyzed using SPSS 21 version. T test was used to compare means and P value < 0.05 was considered as significant.

Results: We found significantly high levels of serum total cholesterols, triglycerides, LDL-C in the diabetic (189.00±44.79, 186.58±55.53, 112.63±44.29) as compared to control (167.43±29.42, 140.07±34.81, 96.80±30.68) respectively. The means of the lipid parameters were lower in female diabetic as compared to male diabetic but not significantly.

Conclusion: The study concluded that hypercholesterolemia, hypertriglycerideamia and high LDL-C are the main lipid abnormalities found in diabetes which is risk factor for coronary artery disease.

72PP

Physiological Taste Threshold For Sweet Taste In Type 1 Diabetics.

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Background: The sense of taste is one of the special senses that play an important role in the nutritional status of humans. Taste threshold varies with number of factors. It is increased in systemic diseases like Diabetes. India is the host to largest diabetic population. Diabetic patients are more prone to taste disorders which tend to appear during the course of the disease. Some of them have craving for sweet food which might be due to decreased sensitivity to sweet taste.

Objectives: The present study aimed at comparing the taste threshold of type 1 diabetics & controls (non- diabetics) to assess whether sensitivity for sweet taste is altered in type 1 diabetics.

Materials & Methods: A comparative study conducted at endocrinology OPD, Osmania general hospital, Hyderabad, which includes 100 type1 diabetic subjects of 20 to 45 years & 100 nondiabetic controls. Glucose solutions were prepared at different molar concentrations. Subjects were given Two to three drops of the solution of lowest concentration first on the dorsum of the tongue & then successive higher concentrations of solutions until definite taste was identified. Distilled water was used in between two different concentrations for rinsing.

Results: Diabetic subjects appreciated sweet taste at higher molar concentration than nondiabetic subjects.

Conclusion: Sensitivity for sweet taste decreased in diabetics .Preference for sweet food in diabetics is due to early impairment of sensory perception suggesting that manifestation of the diabetes might even precede clinically recognized disease.

Key words: Taste threshold, type 1 diabetes mellitus.

73PP

Effect of BMI, Fat% and FFM on maximal oxygen consumption

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Background and Aim: Maximal oxygen consumption ($\dot{V}O_{2max}$) is an important measure of cardiorespiratory capacity of an individual at a given degree of fitness and oxygen availability. Risk of cardiovascular diseases increases with increasing degree of obesity and a low level of $\dot{V}O_{2max}$ has been

established as an independent risk factor for cardiovascular mortality. Hence, the study was designed to determine the $\dot{V}O_{2max}$ of young adults and to find correlation of BMI, Fat% and Fat Free Mass (FFM) with $\dot{V}O_{2max}$.

Methods: Fifty four (male=30, female=24) healthy young adults of age group18-25 years after screening by PAR-Q participated in the study. Height was measured by Stadiometer. Weight and Body composition were measured by 'Omron Body Composition Monitor HBF-701'. $\dot{V}O_{2max}$ ($mL.kg^{-1}.min^{-1}$) was obtained by Submaximal Exercise Test by Bruce Protocol with the basis of Linear relationship of Heart Rate (HR) and $\dot{V}O_2$. Work output measured by pre-defined Treadmill speed and Grade on 'RMS Vega 201 Stress Test System'. HR obtained by 'Claritymed Cardiac Monitor'. Data was analyzed statistically in 'GraphPad Prism' software version 6.01 for windows.

Result: $\dot{V}O_{2max}$ ($mL.kg^{-1}.min^{-1}$) of male(43.25±7.25) is significantly ($t=7.5718$, $p<0.0001$) higher than female (31.65±2.10). BMI has a weak negative correlation ($r= -0.3232$, $p=0.0171$) with $\dot{V}O_{2max}$ but Body Fat% has a strong negative correlation ($r= -0.7505$, $p<0.0001$). FFM is positively correlated ($r=0.3727$, $p=0.0055$) with $\dot{V}O_{2max}$.

Conclusion: Increased Body Fat is associated with decreased level of maximal oxygen consumption in young adults. Obesity in terms of Fat% is a better parameter than BMI for prediction of low $\dot{V}O_{2max}$.

Keywords: Body Composition, Bruce Protocol, Maximal oxygen consumption, Submaximal Exercise Test, $\dot{V}O_{2max}$.

74PP

A correlation between percentage change in body mass index and quality of life in obese persons after a week of yoga practice

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Background: An increase in body mass index i.e. BMI have been associated with a reduction in a quality of life, i.e. QOL and there have been studies assessing the effects of yoga on anthropometric variables. The present study was planned to assess the correlation between percentage changes in BMI and QOL before and after a one week yoga program in obese persons.

Methods: Twenty-four obese participants ages ranging between 20 to 60 years (group mean ± SD, 42.0 ±11.2 years) enrolled in the study. Signed informed consent of all participants was taken prior to the study and was approved by the Institutional Ethics Committee. Participants were assessed for BMI using Body Composition Analyzer and QOL was assed using Moorehead-Ardelt Quality of life Questionnaire-II before and after one week of yoga dietary intervention. Data was analyzed using Pearson method of correlation with SPSS version 18.0.

Result: No significant correlation was found between the percentage change in BMI and QOL before and after a week of a yoga program.

Conclusion: Changes in BMI and QOL showed no correlation after 1 week of yoga, possibly due to the short intervention.

75PP

Body Mass Index, Central Obesity & Oxidative Stress In Relation To Sperm Parameters

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Background: Today, the incidence of overweight and obesity in men of reproductive age is rising at an alarming rate, associated with oxidative stress, affecting fertility.

Objective: To assess the relationship between Body Mass Index (BMI), central obesity expressed by Waist Circumference (WC), oxidative stress measured by Protein Carbonyl (PC) and sperm parameters in infertile and fertile men.

Method: Semen samples of 286 males (group A- 155 infertile; group B- 131 fertile) were examined along with their age, height, weight, WC and PC. BMI was calculated as kg/m2. Semen analysed by Makler Counting chamber and PC estimated by Levin's method. The power of the study: 0.91.

Results: In group A, BMI was negatively correlated with Motility (r =-0.915,p<0.001) and Sperm Count (r=-0.947, p<0.001) but positively correlated with PC(r=0.921, p<0.001) and rapid progressive motility (r=0.941, p<0.001).

In group B, BMI was negatively correlated with rapid progressive motility (r=-0.892, p<0.001) and Sperm Count (r=-0.838, p<0.05) but positively correlated with PC (r=0.913, p<0.05). BMI has significant positive correlation with WC in both group A (r=0.934, p<0.001) and group B (r=0.822, p<0.001).

WC, a measure for central obesity, inversely associated with Sperm Count (r= -0.984, p<0.001). Interestingly PC was elevated in overweight infertile males (2.201+1.190nmol/mg vs. 1.357+1.346nmol/mg).

Conclusion: This study shows that overweight is a contributory factor for oxidative stress leading to male infertility. This helps the clinician to modify the lifestyle of Gen-XY.

76 PP

Correlation between body composition and muscle strength in a healthy student population

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Background: Body composition is shown to alter with increased fat mass, decreased lean body mass, and reduced muscle strength. However, no direct correlation has been reported so far between body composition and muscle strength in student population. The present study was aimed to assess the correlation between body composition and muscle strength in healthy student population.

Methods: Thirty healthy graduate students were recruited with ages ranged between 20 and 30 years (group mean age±SD, 22.8±2.4 years) were recruited for the study. Those having any health problem, taking alcohol and any medication were excluded from this study. Signed informed consent of all participants was taken prior to the study and was approved by the Institutional Ethics Committee. Body composition was determined by the bio-electrical impedance analysis method using a body composition analyzer (BF-907, Maltron, U.K.). Handgrip strength was measured using a hand grip dynamometer (Lafayette Instrument, Model 7498-05, U.S.A.). Leg and back strength was measured using BACK-D Strength Dynamometer (Takei Japan, T.K.K-5402). Data were analyzed using Pearson's correlation with SPSS version 18.0.

Result: Body composition was not found to be significantly correlated with muscle strength (p>0.05).

Conclusion: Body composition does not influence the performance in tasks requiring muscle strength.

77PP

Study Of Body Mass Index In Patients Of Hypothyroidism Compared to the Normal Subjects.

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Background: Hypothyroidism is one of the most common thyroid diseases in which thyroid gland cannot synthesize enough thyroid hormone to meet the metabolic requirement of the body. Thyroid hormone induces changes in physical activity & body mass. Obesity is increasingly being identified as major epidemic worldwide.

Objective: The Present Study was conducted to determine Body Mass Index in

Hypothyroid Patients compared to Normal subjects.

Materials and methods: A comparative study was conducted at Endocrinology Out Patient Department, Osmania General Hospital, Hyderabad which includes 100 newly diagnosed cases of hypothyroidism and 100 controls in the age group of 20-40 years, both Males and Females.

Study was done during the period of April 2015-July2016.Height was measured with Harpenden stadiometer & weight was measured with standard weighing machine while the subjects were barefoot and wearing light clothes. BMI was calculated as body weight (Kilograms) divided by height squared (Meters). Data of T3, T4 & TSH levels were collected & compared.

Results: The present study indicates that BMI was increased in Hypothyroid patients compared to Normal subjects

Conclusion: This Study suggests that Hypothyroidism influences body weight and BMI of the patients significantly. Hence regular monitoring of BMI in hypothyroid patients will help in early detection of future Obesity related complications.

Keywords: Hypothyroidism, Body mass index

78PP

Contractility in normal human vermiform appendix involves histaminergic mechanisms obtained from pediatric age group.

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Background: Though, vermiform appendix was considered as vestigial organ in the past, but in the recent observations, it was shown as an immunological organ and demonstrated contractility also. Further, cholinergic and serotonergic mechanisms have been reported to mediate contractions in normal appendix of adults. But, the role of inflammatory mediator like histamine has not been investigated in pediatric age group so far. Therefore, present contractility study was designed to investigate the involvement of histaminergic mechanisms in longitudinal muscles of normal human vermiform appendix of pediatric age group.

Methods: *In vitro* contractility study of the longitudinal muscle strips of normal human vermiform appendix of pediatric age group were obtained using Dale's organ bath (containing Kreb's ringer solution continuously bubbled with 100% O2 at temperature of 37 ± 0.5°C) and Statham's isometric force displacement transducer against initial tension of 0.5 g. The contractions thus obtained were considered as control. Contractions were also elicited with histamine (H1-agonist) before and after exposure of the muscle to chlorpheniramine maleate (H1-antagonist). Contractions recorded after exposure to antagonist were compared with before values and a $p < 0.05$ was considered significant.

Results: Histamine (1 µM) produced maximum contractions in longitudinal strips of normal

appendix and these were blocked significantly ($p < 0.05$) by pre treatment of the muscle strip to chlorpheniramine maleate (100 µM).

Conclusion: The findings of the present investigation suggested the involvement of histaminergic (H1) mechanisms in mediating the contractility in longitudinal muscles of normal human vermiform appendix of pediatric age group.

79PP

Stethoscope: History of its evolution and its future scope of advancement in physiology and Medicine

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Background: Stethoscope is a medical device with a multipurpose application. Primarily it is used in auscultating heart sounds however it can also be used in auscultating breath sounds, bowel sounds and fetal heart sounds. The process of auscultation of heart/ breath sounds was very inconvenient in olden days where in one had to place his ears directly on the surface of the chest wall / back and instruct the subject to breath through his mouth. The procedure was even more cumbersome/ awkward in case of female subjects. In 1816, a French physician by name Dr. Rene Lennec invented a new device for the auscultation of heart / breath sounds by using a simple wooden cylindrical structure with a little flared trumpet like ends and called it "Stethoscope". In the later years of 1960's it underwent many modifications to form a new, convenient and more advanced device of current design with two sided chest piece (a bell and a diaphragm). On September 2000, the first Digital stethoscope (Model 4000) was introduced by Littmann with advanced features in acoustics. It had features to record the heart/ breath sounds and transfer it to a computer system as an audio file. A new approach was made in 2009 in designing the Electronic stethoscope which would allow the physician to record, visualize and share the heart sounds in an audio visual file. Most recently in November 2010 medical world witnessed the first ever "Scope to scope tele auscultation system" by which clinicians can auscultate the remote subject over a digital screen and diagnose many clinical conditions.

Conclusion: With an advancement in the science and technology now the stethoscope is looked beyond auscultation and are developed further in making it an effective device in recording / visualizing the heart sounds, abnormal murmurs and ECG patterns.

Key words: Lennec, Stethoscope, Heart sounds, Auscultation.

80PP

Quality of Life In Patients With Glaucoma

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Introduction: WHO BREF score is one of the best available methods to assess quality of life (QoL). This study was planned to study the QoL in glaucoma patients.

Material & Methods: This was a cross sectional study conducted from March 2016 to September 2016 at Integral Health Clinic, Department of Physiology, AIIMS, New Delhi. A total of 78 subjects, 40 cases & 38 healthy controls with mean age 46.7+10.85 & 43.68+9.8 respectively) were included in this study. The patients with glaucoma were recruited from the R.P Centre of Ophthalmological Sciences, AIIMS,New Delhi. QoL was measured by WHO BREF Score, which contains questions related to Physical domain (Domain1), Psychological domain (Domain2), Social relationships domain (Domain3) & Environment Domain (Domain 4).

Comparison was done by unpaired t test & Mann Whitney test according to the distribution of data in all domains using Graphpad Prism version 5.01.

Results: Overall QoL was found significantly lower (p=0.0004) in glaucoma patients as compared to the control subjects (61.46+13.81 vs 71.5+9.5 respectively). Domain 1,domain 2, domain 3 & domain 4 scores were found to be significantly lower in glaucoma patients when compared to the control subjects (p= 0.0025, 0.0004, 0.049 & 0.018 respectively).

Conclusion: This study clearly showed poor QoL in glaucoma patients. Findings of this study may be further validated with larger sample size and interventional study.

81PP

Comparison of perceived exertion during concentric and eccentric exercise

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Background and objective: Resistance Exercise (RE) is beneficial in the prevention and management of chronic conditions like osteoporosis, osteoarthritis, obesity, sarcopenia, diabetes mellitus, impaired physical function, prevention of and rehabilitation from orthopaedic injuries. RE results in fewer cardiovascular disease (CVD) events, improvements in body lipid composition, and blood pressure in individuals with hypertension. Dynamic RE comprises of concentric (muscle shortening contractions) and eccentric (muscle lengthening contractions) phase. The present study aims at determining the physical exertion assessed by Borg's RPE 6-20 scale and percentage heart rate maximum (%HRmax) during concentric exercise (CE) and eccentric exercise (EE).

Methods and materials: In this crossover study, 24 healthy, male adults from KGMU Lucknow, aged 18-25 years, having BMI 18-23 kg/m2, performed an acute bout of CE and EE on an inclined/declined treadmill and with dumbbells involving four major groups of muscle, for half an hour. Systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), mean arterial pressure (MAP), and %HRmax(=HR/HRmax×100) were measured just before and immediately after exercise. Participants told RPE after the workout. HRmax=208–0.7×Age.

Results: SBP (CE:141.08±3.89, EE:135.54±3.22, p<.001*); DBP (CE:83.46±4.19, EE:83.25±3.93, p=.44*); HR (CE:135.33±13.89, EE:121.25±11.12, p<.001*); MAP (CE:102.67±3.09, EE:100.68±2.98, p<.001*); %HRmax (CE:69.67±7.16, EE:62.42±5.76, p<.001*); and RPE (CE:13.25±1.48, EE:11.75±1.19, p<.001**) were higher in CE. *paired-t test, ** Wilcoxon signed-rank test.

Conclusion: At same absolute workload, EE caused significantly less cardiovascular stress and physical exertion as compared to CE. Based on the findings of the current study, we recommend EE training for elderly, frail individuals or those at risk of CVD.

82PP

Diurnal Variation of Body Weight- A Comparative Study Between Normal and Psychotic Patients.

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Background: Psychologically speaking the term "diurnal variation" means fluctuation of any biological process or parameter in different parts of the day. Evidence suggests that diurnal rhythm occurs in a wide range of biological parameter e.g. sleep, hormonal secretion etc. In this study there is diurnal variation of body weight in both healthy and psychotics.

Objectives: 1. To study the diurnal weight changes in psychotics compare to a control population. 2. To study whether it is possible to point out the individuals (control) who may develop psychosis in future.

Material and methods:- Weighing each & every subject(both controls and patients- rated by b.p.r.s) before breakfast and before evening tea using the same weighing scale thrice weekly.

Results: Done by two tailed unpaired "t "statistics.

Conclusion: The present study demonstrates the existence of significant diurnal weight gain in psychotics in comparison to normal.

83PP

Prediction of Human Reaction Time by Using Regression Analysis

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Introduction: Reaction time (RT) is defined as the elapsed time between the presentation of a sensory stimulus and its behavioral response. Simple reaction time is usually defined as the minimum time required for an observer or subject to detect the presence of a stimulus. There are many research works on the visual reaction time and auditory reaction time to study the influence of various factors associated with them and found highly correlated to each other.

Material Method : The data was collected by using healthy 150 samples aged between 18 to 6o years**.**The simple reaction time was measured by using **t**he machine "IMCORP Ambala Reaction Time Instrument" was used to acquire the simple reaction time in study subjects. The auditory reaction time and visual reaction time both are measured in study subjects.

Result & Conclusion : Due to the lack of well developed statistical models, reaction time can not be be predicted for specified group of people . Therefore, in this paper we developed a relationship between reaction time,age & BMI for the study subjects by using regression technique.The predicted reaction time is obtained in the form of **RT= -10.6 ×Age – 0.48×BMI + 420.**The high value of coefficient of determination (R^2= 0.85) supports our model favorably.

Key Words: Auditory Reaction Time, Statistical Model, Correlation & Coefficient of determination

84PP

ELISA kits can be validated by testing for precision, accuracy, sensitivity and specificity (PASS)

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Background: The validity of ELISA test for biomarkers can be done by testing for precision, accuracy, sensitivity and specificity. Though, the preformed kits are standardized, but since biomarkers are present in minute amount in the body, even small variation in standard composition or any dilution error can lead to erroneous measurement. To check for the validity and accuracy of ELISA kits in estimation of plasma levels of Interleukin-6 (IL-6), Adiponectin and Endothelin-1 (ET-1)

Methods: ELISA Kits for IL-6, Adiponectin and ET-1 were procured from Gen-probe, Biovendor and Biomedica respectively. During the protocol for ELISA of these markers, standards were run in

triplicates. For precision of the test, we calculated inter-assay and intra-assay coefficient of variance for 6 standard concentrations. The accuracy (Standard recovery) was checked by comparing claimed concentration and concentration of the standard calculated by equation of linear or 4-PL curve of absorbance and concentration. Standard recovery was calculated as ratio of observed concentration and actual (claimed) concentration. Sensitivity was measured by serial dilution and measurement of absorbance till possible. Specificty was checked by cross reacting with bovine serum albumin.

Results: The mean Inter-assay and intra-assay coefficient of variance for IL-6 were 3.49 % and 0.87 % respectively. The mean intra-assay coefficient of variance for Adiponectin and ET-1 were 0.75 % and 0.80 % respectively. The mean standard recovery for IL-6, Adipnectin and ET-1 were found to be 98.16 %, 98.8 % and 97.8 % respectively. The sensitivity for IL-6, Adiponectin and ET-1 were detected as 0.18 pg/mL, 0.47 ng/mL and 0.02 fmol/mL.

Conclusion: The Preformed purchased ELISA kits can also be validated by PASS criteria. In our test we found the precision, accuracy, sensitivity and specificity of the kits were within normal limits. The dilution accuracy and methodological errors can also be picked up by checking the standard recovery.

85PP

Histaminergic mechanisms mediate the contractility of inflammed human vermiform appendix from pediatric patients.

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Background: Appendicitis is a well known entity causing morbidity and mortality especially in children worldwide that often requires surgical intervention. Histopathological studies of appendicitis revealed injury to its neurons and interstitial cell of Cajal networks. These observations suggest alteration in contractility of appendix in inflammed condition. Further, histamine is a well known mediator of the inflammation but its role in mediating the contractility of inflamed appendix has not been assessed especially in children. Therefore, present study was undertaken to determine the role histaminergic mechanisms in mediating the contractility of longitudinal muscles of inflammed vermiform appendix of pediatric age group.

Methods: Contractility of the longitudinal muscle strips of inflammed vermiform appendix obtained from children of either sex of age group between 7-12 years, were recorded in Dale's organ bath using Statham's isometric force displacement transducer against initial tension of 0.5 g with Kreb's ringer solution which was bubbled continuously with 100% O2 and temperature was maintained at 37±0.5°C. These contractions were considered as control. Further, contractions were obtained with histamine, before and after exposure of the muscle strip to chlorpheniramine maleate (CPM). Contractions obtained after exposure to antagonist were compared with before values and a $p < 0.05$ was considered significant.

Results: 10 µM of histamine produced maximum amplitude of contractions in inflammed human vermiform appendix and these contractions were blocked significantly ($p<0.05$) by histaminergic H1 antagonist, CPM (100 µM).

Conclusion: The present investigation suggested the involvement of histaminergic (H1) mechanism in mediating the contractilty in longitudinal muscles of inflammed appendix of pediatric age group.

86PP

A Study of Vascular Endothelial Growth Factor in the Cord Bloodof Pre-Eclamptics and Healthy Pregnant Women

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Background:Pre-eclampsia(PE) is the most frequently encountered medical complication during pregnancy. Indeveloping countriesPE is a principal cause of maternal mortality. A disturbance in the angiogenic/antiangiogenic factors and in the hypoxia/placental reoxygenation process, seems to activate a maternal endothelial dysfunction.

ObjectiveTo estimate Vascular Endothelial Growth Factor (VEGF) level in the cord blood of healthy and Preeclamptic (PEc) pregnant women and to associate this with Preeclamptic pregnancy.

Material method:A case-control study ofUmbilical cord serum VEGF levels from women with uncomplicated pregnancies (control group, *n*=60) and pregnancies complicated by Pre-eclampsia (*n*=40) .VEGF in the cord serumwas estimated by SANDWICH Enzyme Linked Immunosorbent Assay method by using ELISA Kit and then compared between the two groups.Data were presented as mean ± standard deviation. Statistical differences between the studied groups were calculated by using the Two sample t- test with equal variances, Mann –Whitney test, chi – squared with ties.

Results The mean VEGF concentrations in the women who had pre-eclampsia (578.62±468.3) were lower than in the control group(625.75±533.1) , but the difference was not statistically significant (p= 0.8548).

Conclusion VEGF plays a key role in theinstability between endothelial dysfunction and angiogenesis thatoccurs duringPreeclampsia. VEGF levels might be a useful tool for the early diagnosis of Pre-eclampsia.

Keywords: Vascular Endothelial Growth Factor , Pre-eclampsia , cord blood

87PP

Evaluation of Platelet Count in Dengue Fever among the patient visiting NMCH, Patna.

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Background: Dengue is one of the most prevalent mosquito-borne arboviral infection in India. Seventy percent of the 96 million apparent infections occur in Asia, in which India is making upto one third of the total. Despite considerable efforts to control the mosquito populations, dengue fever has emerged, spread and established itself rapidly. The most serious manifestations of the infection are Dengue Hemorrhagic Fever and Dengue Shock Syndrome.

Objective: Evaluation of platelet count in Dengue Fever.

Materials and methods: The present study was conducted retrospectively for a period of 6 months from July 2015 to December 2015. Blood samples were collected from 30 patients experiencing a febrile illness, clinically consistent with Dengue infection. Serological confirmation of Dengue infection was done and platelet count was done in all the serologically positive cases.

Results: Out of 30 suspected cases, 6 cases (20%) were confirmed as serologically positive. The difference between numbers of serologically positive cases during different months was significant. Larger proportions of serologically positive cases were observed among adults. Outbreak coincided mainly with the post monsoon

period of subnormal rainfall. The difference between serologically positive cases as compared to serologically negative ones in post monsoon period was significantly higher.

Conclusion: This retrospective study highlighted a drastic fall in the platelet count which is life threatening. More studies in this regard could further reveal the correlation between the platelet count and dengue outbreaks, which would help in making the strategies and plans to manage any outbreak in future well in advance.

88PP

Influence of Maternal Preeclampsia on Hematological Profile of Newborns of Lucknow

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Background: This study was done to observe the effects on cord blood CBC parameters of newborns from Preeclamptic and Normal Pregnancies. Also the changes in hematological profile of Preeclamptic and Normal mothers were assessed.

Material and Methods: This is a cross sectional study based on Umbilical Cord Blood samples of 68 newborns and their mothers of which 34 were Preeclamptic and 34 were normal healthy pregnancies. 3 ml venous blood was collected in EDTA coated tubes from the mother just before delivery and 3 ml umbilical cord blood was collected from the neonate in EDTA coated tubes at the time of delivery for CBC analysis. Reticulocyte count was done using brilliant cresyl blue. The data entry and analysis was done on computer package Microsoft Office Excel 2007.

Results: Hb, RBC indices, Reticulocyte Count were found to be higher in newborns from Preeclamptic mothers than those from normal pregnancies. Total Leukocyte Count and Neutrophil Count were lower in Preeclamptic females and their newborns than those with normal pregnancies. Platelet count was found to be lower while MPV higher in newborns from Preeclampsia than those from normal pregnancies. Reticulocyte production index was found to be higher in females with preeclampsia than those with a normal healthy pregnancy.

Conclusion: Preeclamptic mothers and their newborns should be carefully monitored in terms of haematologic abnormalities as we can expect a deranged haematological profile in these cases and their early detection in the course of disease can play a vital role in combating the morbidities and mortalities associated with Preeclampsia. We also recommend similar type of large scale studies in establishing the reference values for umbilical cord blood as most of the data we have are based on peripheral blood samples.

Key words: Haemoglobin, Total Leukocyte Count, Platelets, MPV, Reticulocyte count, RPI

89PP

Study of Haematological Parameters in Pre-Eclampsia.

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Background: Hypertension affects 7-15% of all pregnancies .It is associated with 16% of all maternal mortality and 20% of all perinatal mortality in India. Haematological abnormalities such as thrombocytopenia and decrease in some plasma clotting factors may develop in Preeclamptic women.

Aim & objectives of the study: To compare haematological parameters between normal and hypertensive patients.

Materials & methods: The present study was carried out at Osmania General Hospital ,OBG Dept and Dept of Pathology , Hyderabad. Study group included 30 females of preeclampsia attending antenatal clinics and inpatient ward aged 20-35 years, free from any other complication of pregnancy. Control group included 30 normal pregnant females of same age group. Parameters measured in the blood sample are: 1. Platelet count- "Automated Haematology Analyzer". 2. Bleeding time –Dukes Method. 3. Clotting time- Wrights capillary tube method.

Results: Statistical analysis- The unpaired t test was applied. $p<0.05$ was selected for significance. The platelet count showed significant decrease compared to study group. The bleeding time and clotting time showed an increase but it was not statistically significant.

Discussion & conclusion: Prolonged bleeding time associated with thrombocytopenia may be due to impaired synthesis of thromboxane. Clotting time increase could be due to accumulation of fibrinogen derivatives,depression of fibrinolytic activity,and alterations in clotting mechanisms. Thrombocytopenia is directly proportional to the severity of PIH. Counts below 1 lakh/ml increases risk of DIC and HELLP syndrome significantly, thus giving an early prediction suggesting prompt management. Platelet nadir is the best predictor of maternal mortality.

90PP

Association of Blood Groups in Diabeties Mellitus.

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Background: Diabetes Mellitus (DM) describes a metabolic disorder of multiple etiologies characterized by chronic hyperglycemia with disturbance of carbohydrate, protein & fat metabolism resulting in Insulin secretion/insulin action/both. Major human blood group system discovered by LANDSTEINER in 1900 is ABO. Different studies showed findings regarding the blood group as risk factor for DM. Since DM is a serious complication of various organs, the current study was done to find out the association between different blood groups & DM.

Objective: To determine the relationship between ABO blood groups & DM.

Materials & methods: The present institutional study analysis of ABO blood group among 100 subjects of every age taken was randomly from Endocrinology OPD of Osmania General Hospital. Out of 100 subjects; 50 were non-diabetic taken from the patients attendants. The remaining 50 were DM patients.ABO blood group of all subjects was determined by SLIDE AGGLUTINATION method.

Results: It was observed that there was no significant difference in frequency of ABO blood group in controls & diabetic patients in all studied subjects. This study of ABO blood group shows that 'B' blood group was more in frequency compared to the rest in DM.

Conclusion: We conclude that blood group 'B' needs to be closely monitored during medical checkups for early detection of DM type II, for better management & prevention of future complications.

91PP

Study of Distribution Of ABO Blood Groups In Beta-Thalassemia Patients

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Introduction: The thalassemias are a group of inherited hematological disorders caused by defects

in the synthesis of one or more of the hemoglobin chains. Beta thalassemia is caused by reduced or absent synthesis of beta globin chains which causes hemolysis and impair erythropoiesis. Affected children will require regular lifelong blood transfusions of ABO blood groups.

Blood group is one of the important and comparatively known parameter to the large number of present population which exhibits a strong correlation with some common diseases like cardiovascular diseases, gastric cancer, HIV infection and more to enumerate. This study is thereby an attempt to explore any relationship between blood group antigens and Beta-Thalassemia so that it will become very easy to predict the type of population which is more prone or resistant to Beta- Thalassemia. Also the study of this relation between blood groups and the disease is extremely important for understanding the regional demand of rare blood groups and to tide over the massive demands.

Aims and Objectives: 1) To study relation, affinity& family predisposition between beta thalassemia & specific blood groups. 2) To study the complications in terms of frequency, severity & onset in such patients in specific blood groups.

Materials & Methods: This is a cross sectional, single centric, open labeled, observational study in which 100 patients of beta thalassemia are screened for their ABO blood groups after taking permission from institutional ethics committee & informed consent form from the patient.

Result: Results will be discussed at the time of presentation.

Conclusion: The present study gives vital information regarding the management of blood bank and transfusion services in the community.

Key Words: Beta-Thalassemia, Blood Groups, Slide method.

92PP

Anxiety of public speaking: a barrier to clarifying doubts by first MBBS students.

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Background: A large set of the first MBBS students seems to be not able to clarify doubts during didactic lectures in physiology, leading to loss of valuable opportunity for filling the gaps in their knowledge of the topic. A pilot study pointed to anxiety of public speaking, among the students.

Objectives: This study was undertaken to gauge the extent of anxiety of public speaking among the first MBBS students as a cause of failure to solve their doubts during didactic lectures in physiology as well as to suggest practicable remedial measures.

Material and methods: A questionnaire was administered to 151 first MBBS students, who consented for the study, to gauge the extent of the issue of anxiety of public speaking and find reasons thereof. The answers were kept anonymous and open ended to ensure candid and non-leading responses. The open ended esponses were classified and analyzed for proportion of the subjects having anxiety of public speaking as well as various reasons for the same.

Results: Twenty seven percent (41/151) subjects preferred not to respond to the question. 30% (33/110) of the responder subjects admitted anxiety of public speaking having kept them from asking questions to solve their doubts during didactic lectures.

Conclusion: A sizeable strength of the first MBBS students is inhibited from solving their doubts during didactic lectures in physiology. Reasons thereof have been discussed. The problem does not seem to be insurmountable. Possible practicable

solutions, including the important role of the faculty, have been explored.

93PP

Serum Magnesium Levels in Premenopausal and Postmenopausal Assamese Women: A Comparative Study

Neelakkhi Kalita[1], Biju Choudhury[2]

Introduction: Magnesium deficiency may play a role in post menopausal osteoporosis, disturbances in cardiac rhythm, a high value of total cholesterol, atheromatous plaques and persistence of climacteric symptoms.

Subjects and methods: 100 women attending outpatient departments of GMCH, Assam including healthy premenopausal (Group A. n=50, age range= 20 to 40years) and postmenopausal women (Group B. n=50, age range=45 to 75 yrs).

All women were non smokers and those with major systemic illnesses (diabetes, thyroid disorder and oncological diseases) were excluded. Blood was collected after overnight fasting and centrifuged, and serum magnesium level was determined by colorimeter. Serum magnesium concentrations between 1.68 and 2.4mg/dl was accepted as reference normal range.

Results: Average serum magnesium levels in the premenopausal population were 2.13mg/dl±0.39 mg/dl while that of the whole postmenopausal group was 1.99mg/dl±0.24mg/dl. Mean serum magnesium level in the two subgroups of post menopausal women i.e. <65 years and ≥65 years were 2.05mg±0.20mg/dl and 1.89mg/dl±0.28mg/dl. The analysis revealed (Student's t-test) statistically significant differences between serum magnesium concentrations depending on the time interval since the final menstruation (P<0.05).The highest median serum magnesium was recorded in the premenopausal group (median serum magnesium concentrations - group A=2.05mg/dl, group B=1.9mg/dl, group B1=2mg/dl, group B2=1.8 mg/dl).

Conclusion: Serum magnesium concentrations in postmenopausal women were low and decreasing with the time since the final menstruation, though postmenopausal women below 65 years of age had serum magnesium levels not significantly lower than the premenopausal group (p>0.05).the analysis of available data does not provide any clear explanation for hypomagnesaemia in elderly postmenopausal women but studies have reported the increase in renal magnesium excretion in them, and also dietary deficiencies.

94PP

Status of serum Vitamin D level among school going children in Manipur

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Background: The study was taken to determine the status of vitamin D among school going population of Manipur where the race, culture, socio-demographic pattern and dietary habits are different from the rest of the country.

Objectives: To study serum vitamin D level among school going population of Manipur and to determine correlation between vitamin D level and selected variables of interest like sex, sunlight exposure, habitation with reference to diet and social habits.

Material and methods: A Cross sectional study was conducted in the department of Physiology, RIMS and from selected schools of urban and rural districts of Manipur. Serum Vit. D was analyzed by using Erba LisaScan EM Automated Microplate ELISA Reader. Data were analyzed using SPSS version 21(IBM). Descriptive statistics like mean, standard deviation and percentages were used. Chi

square test is used to see for association between different variables.

Results: Out of 205 students, n=127(62%) were females and n=78(38%) were males. Status of vitamin D revealed normal 53(67.9%) males & 43(33.9%) female, insufficiency 9(11.5%) males & 38(22.8%) females and deficiency 16(20.5%) males & 55(43.3%) females. Differences in the levels of vit.D between males and females and between urban and rural are found to be statistically significant.

Conclusion: In this study 46.8% student were having normal vit.D level. There is significant difference in vit.D level between gender, and between urban and rural areas in the study.

95PP

Study on iron deficiency anemia in urban and rural adolescent school children of Manipur

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Background: Iron deficiency anemia due to dietary deficiency and increasing demand for iron for growth spurt during adolescence has been a serious health concern in the developing countries with physical and mental health outcomes. Studies in India have shown high prevalence among the adolescent population. Paucity of similar studies in north east India to compare and study prevalence and contributing variables still exists.

Objectives: We aim to study prevalence and contributing factors of iron deficiency anaemia among adolescent children in rural and urban schools of Manipur.

Materials and methods: A cross-sectional study was carried out in 297 adolescent children of rural and urban schools in the age group13-19 years in Imphal and Thoubal districts of Manipur. Relevant history taking and anthropometric measurements were recorded using a predesigned proforma. Haemoglobin estimation and serum ferritin assay were done by Cynamethaemoglobin method and ELISA respectively. Statistical analysis of the data was done using unpaired t-test in Graph pad prism version 6.

Results: Overall prevalence of anemia was found to be 54.5%, out of which 24.6% were iron deficiency anaemia. Haemoglobin among female study population of private (12.43±0.22) and government (11.24±0.20) schools was found statistically significant ($p<0.05$). BMI, Haemoglobin and Serum ferritin between rural and urban school children were found statistically significant ($p< 0.05$).

Conclusion: National programmes related to supplementary nutrition should focus more in rural schools. School health programme should focus on raising awareness on vulnerability and negative health outcomes of anaemia among the students.

96PP

Is ghee really bad for us? A comparative study of dietary consumption ghee by replacing with butter on serum lipids of healthy young adults

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Background and aim: Ghee contains high amount of saturated fatty acids. Empirical evidence about harmful (or beneficial) effects of dietary intake of ghee on serum lipid profile in human subjects is at best inconclusive in nature. The present study was done to study and compare the effects of consumption of ghee and butter, on serum lipid profile of healthy young adults

Method: The study was conducted in student's campus hostel in SMIMS , Gangtok, Sikkim. 46 healthy young adult volunteers (1st year MBBS)

participated in this study. Study followed a randomized crossover design with two intervention periods of six weeks' duration separated by a five week washout. The main outcome measures were Serum concentrations of total cholesterol, triglyceride, low density lipoprotein, high density lipoprotein, and very low- density lipoproteins in response to dietary intake of butter and ghee.

Results: Pre and post interventions (ghee and butter) showed a statistically significant difference ($P<0.05$) in total cholesterol, TG, LDL and VLDL, except for the HDL levels. The change in lipid profile brought about by both the ghee and butter diet when compared did not show statistically significant ($p>0.05$) difference.

Conclusion: The outcome of this study, demonstrated that ghee and butter increases the plasma lipid significantly, post intervention, however, the change brought about by both ghee and butter are same.

Key words: Ghee, serum lipids, crossover

97PP

Perception of illness and mental well-being in patient population: a cross-sectional study

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Background: Multiple aspects of functioning and well-being have been studied on a patient population but the correlation between the perception of illness and mental well-being was not studied. Hence the present study was designed.

Methods: Forty patients (27 males and 13 females) with different diseases (including musculoskeletal, cardio-vascular, digestive, respiratory and psychiatric disorders) participated in this study. Their ages ranged between 18 and 60 years (group mean ± S.D., 39.03 ± 14.52 years). They all were patients visiting the out-patient department in a yoga and Ayurveda hospital located in the north of India. The patients willing to participate in the study were included and those having cognitive impairment or any major psychiatric illness were excluded from the study. Signed informed consent of all participants was taken prior to the study and was approved by the Institutional Ethics Committee. It was a cross-sectional study with onetime assessment. Perception of illness was assessed using The Brief Illness Perception Questionnaire and their mental well-being was assessed using The Warwick-Edinburgh Mental Well-being Scale. Pearson correlation was estimated using PASW (SPSS 18.0 Version) to determine the correlation between perception of illness and mental well-being.

Result: There was a significant negative correlation between the scores on perception of illness and mental well-being in patient population ($p<0.05$).

Conclusion: Patients having a more threatening view of their illness have low levels of mental well-being.

98PP

A Study of Knowledge, Attitute, Beliefs and Use of Over The Counter (OTC) Drug Products among Medical Undergraduates"

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Background: Over the counter drug products are available without prescription and considered safe, effective, affordable & easily accessible. Use of OTCs and even prescription drugs available as OTCs is increasing day by day among medical students.

Objectives: This study was carried out to assess the knowledge, attitude and beliefs about OTCs, their

use, safety and regulatory issues among medical undergraduates.

Material and method: 151 medical students participated in this questionnaire-based study. A preformed and validated questionnaire was used consisting of 2 parts. Part 1 consisted general information regarding OTCs and Part 2 consisted information about knowledge, attitude, beliefs& use of OTCs. Data were analyzed and the results expressed as percentages.

Results: 100% participants were aware about OTCs. 70% used them a lot because of availability and belief on safety. 38% considered chemist as a good source of advice over minor medical problems. 62.5% knew the information to be read on drug label. Affordability & accessibility(84%) was the main reason for OTCs use. Antibiotics, antihistaminics (100%) & cough syrups (90%) were common medications bought without prescription. Headache & fever(100%), acidity(91%) were common indications for OTC use. Painkiller, antacids & skin care products were found to be commonly stocked at home.

Conclusion: All medical students though were aware of OTCs but had little knowledge of regulation & usage. Prescription drugs were available as OTCs. They need to be educated & trained about OTCs & the related issues.

99PP

Adverse drug reactions due to anti tubercular drugs during the initial phase of therapy in hospitalized patients for tuberculosis in SKMCH, Muzaffarpur, Bihar.

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Objective of study: To study the ADRS occuring due to first line Anti tubercular drugs , to assess its risk factors and severity .

Material and Method: A prospective study of 500 patients from IPD (indoor patient department) Medicine and IPD TB & chest (including DOTS and DOTS Plus centre) in SKMCH, Muzaffarpur, Bihar done from April 2015 to June 2016. Total

500 Patients included in study and reviewed for at least first 2 months of initiation of treatment.

Result and analysis: data of 500 patients were analyzed and finding was 64 ADRS in 60 patients, which is more common in female patients (36) as compared to male patients (24). The most common ADRS noted was increased in liver enzyme (54.69%) followed by GIT symptoms(10.94%). Most cases of ADRS noted in first 30 days of initiation of treatment and mostly it is due to multi drug treatment and the most common drugs responsible are Isoniazid and Pyrazinamide.

Importance of study: To improve patient care and safety in relation to the use of medicines and all medical and paramedical intervention and providing early warning and communications of problems which might affect the success of programme. It will thus support the safe, rational and more effective use of Medicine.

100PP

Protective Role of Aqueous Extract of *Capsicum annum* against Ethanol Induced Nephrotoxicity

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Background: Chronic Kidney Disease is a concerning public health issue with an increasing prevalence in the society. It is a progressive pathological condition which in due course may result in renal failure. Excessive alcohol consumption for prolonged period

may directly impair kidney function, or in association with alcoholic liver disease (hepato-renal syndrome).

Objectives: The present study aimed to evaluate the protective role of aqueous extract of green *Capsicum annum L. (CA)* against ethanol induced nephrotoxicity in male wistar rats.

Materials and Methods: Rats were grouped (n=6) in the following manner: ethanol (1gm/kg bw, i.p.) treated, *CA* (250 mg / kg, i.p.) treated, ethanol co-treated with *CA* (similar doses) and the control group (0.5 ml normal saline i.p.) for 30 days. The extent of tissue damage was assessed from serum urea, creatinine and BUN levels, bio-markers of tissue oxidative stress and histo-morphological alterations through H-E staining.

Results: Ethanol administration significantly increased ($p \leq 0.001$) serum urea, creatinine and BUN levels, along with Lipid peroxidation and Cu-SOD levels in tissue. Ethanol also significantly reduced ($p \leq 0.001$) levels of tissue GSH, Mn-SOD, and Catalase activity. Co-treatment with CA significantly ($p \leq 0.001$) restored the above changes to near normal values. Histo-morphological analysis of H-E stained kidney sections also ascertained the preventive role of *CA* against ethanol induced cellular damage.

Conclusion: It can thus be concluded that aqueous extract of *CA* can prevent ethanolic stress induced renal damage.

Keywords: *Capsicum annum*, Ethanol, Reno-protection

101PP

Development and validation of UHPLC-MS/MS method for simultaneous determination of 10 fluoroquinolones antibiotics in human plasma

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Purpose: It is of major interest to study a bio-analytical method of Fluoroquinolones (FQs) antibiotics required for the development of QSPR algorithm for the corneal penetration of antimicrobial agents. Therefore, the present study has been conducted to establish and validate UHPLC-MS/MS method of 10 FQs analytes in human plasma.

Methods: A bio-analytical method was developed using liquid chromatography coupled with positive electrospray ionization tandem mass spectrometry in plasma. Gradient separation of alanytes was achieved using Atlantis T3 analytical column with mobile phase combinations consisted of MilliQ water with 0.3% formic acid (FA), methanol with 0.1% FA and acetonitrile with 0.1% FA pumped at a flow rate of 0.5mL/min in total runtime of 11min. Multiple reaction monitoring (MRM) mode was employed for the identification and quantification of each analyte. This newly developed method was validated according to the currently accepted USFDA guidelines for bio-analytical method validation.

Results: Fluoroquinolones antibiotics (ciprofloxacin, gatifloxacin, gemifloxacin, lomefloxacin, moxifloxacin, nadifloxacin, norfloxacin, ofloxacin, pefloxacin, sparfloxacin) were studied for the development of bio-analytical method development. All analytes validation parameters were in the range as described in the US-FDA guidelines. Cross-analyte interference was found below 11.67% for all analyte and it was 3.39% in case of internal standard (Sulphadimethoxine).

Conclusion: A rapid, highly sensitive and reliable UHPLC-MS/MS method was developed and validated for cassette dosage analysis of 10 FQs in plasma. Further, this method needs to be validated in aqueous humor and vitreous humor and will be

used for cassette dosage analysis of 10 FQs in ocular fluids.

Acknowledgment: We acknowledge DBT (Grant No. BT/PR9718/BID/7/466/2013) for providing financial assistance.

102PP

Effect of Inflammation on Drug Transporters in Experimental Model of Uveitis

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Purpose: This study was planned to investigate the impact of endotoxin induced inflammation on various drug transporters in the experimental model of Uveitis.

Methods: Wistar rats of either sex (n=4) were used for this study. Lipopolysaccharide (E. coli endotoxin) (LPS) was administered at the dose of 200 µg into the hind paw and saline was injected in control animals. TNF-α was estimated at 24 hrs in the aqueous humor by ELISA. Expression of 9 transporters of ABC and SLC family were studied in the ocular tissues by qRT-PCR in 24 hrs post LPS challenge. Fold change in the gene expression was calculated by ΔΔCt method.

Results: Protein concentration, cell infiltrates and TNF-α levels were elevated in aqueous humor 24hrs post LPS injection as compared to the control group. In cornea, SLC22A1, SLC22A2, SLC22A6, SLC15A1 and SLC15A2 were upregulated whereas SLC22A7, SLC22A3, SLC15A1 and ABCB1 were downregulated. In iris-ciliary body SLC22A1, SLC22A2, SLC22A3, and SLC22A8 were upregulated and SLC22A6, SLC22A7, ABCB1 were downregulated but there was no significant change in the expression of SLC15A1 was found. In retina SLC22A1, SLC22A6 and SLC22A7 were upregulated and SLC15A2 and ABCB1 were downregulated but there was no significant change seen in the expression of SLC22A2 and SLC15A1.

Conclusion: This study revealed altered expression of various drug transporters in the experimental model of inflammation. The timeline of the progression of the blood ocular barrier dysfunction in rat model suggested the need for earlier intervention in the inflammatory conditions in the uveitic patients.

103PP

Phytochemical analysis & antidiabetic avtivity of flower of *Oroxylum indicum* and comprehensive review on its medicinal properties

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Background: *Oroxylum indicum* (*Bignoniaceae*) have been used in Ayurvedic medicine, traditional Chinese medicine and folklore for a wide range of ailments. Scientific investigations have revealed number of phytocompounds having pharmacological action. Flower of *O. indicum* is used as vegetable by sikkimese tribe. Traditionally, it is believed to have antidiabetic property which has been documented in some literatures; however the scientific validation is still lacking. Hence the present study aims to investigate various phytochemicals and evaluate antidiabetic activity.

Material and method: The review followed extensive search for existing literature from various database in which the flower of *O. indicum* was found to be unexplored for antidiabetic activity. So,

analysis of the hydro-ethanolic extract for presences of phytochemicals qualitatively was performed. Total phenolic, flavonoid and tannin contents were estimated in terms of gallic acid equivalent, rutin equivalent and tannic acid equivalent respectively. Furthermore, screening for antidiabetic property in Wistar rats is in ongoing phase (IEC/159/13-37).

Result: Extensive literature survey revealed numerous pharmacological activities including antiinflammatory, antiulcer, antimicrobial, antiarthritic, hepatoprotective, immunostimulant, antimutagenic, antiproliferative and antioxidant activities which are published in 53 different scientific papers till date.

In the present study, phytochemical analysis revealed the presence of flavonoid, saponin, tannin, phenol, alkaloid, anthocyanin and terpenoid. The extract was found to contain total phenol (4.069±0.076 mg GAE/g), total flavonoid (14.53±0.92 mg RE/g) and total tannin (14.19±0.45 mg TAE/g).

Conclusion: Comprehensive review of *O. indicum* covered its traditional and folk medicinal uses as well as phytochemistry and pharmacology. Moreover, various phytochemicals present in the extract could attribute for its antidiabetic property, which needs to be validated experimentally.

Keywords: Antidiabetic, *Oroxylum indicum*, phytochemicals

104PP

Development and characterization of isoflavone topical formulation and ocular kinetics after a single drop application in rabbits by LC-MS/MS

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Purpose: Phytoestrogen has been reported to improve sex steroid deficient dry eye condition in postmenopausal females. Therefore, the present study was conducted for developing and characterising a topical isoflavone formulation for its future therapeutic potential in treating this disease condition.

Methods: Isotonic topical formulation of 0.1% genistein, a well reported isoflavone with medicinal property, was formulated using beta-cylclodextrin as soulibilising agent and was further characterized for its pharmaceutical parameters and physicochemical properties viz., solubility, drug content, and stability. Further quantification of genistein in the pre-corneal tear film after single topical application (50 ul) of 0.1% genistein formulation was carried out on rabbits(n=4). The protocol was approved by the standing animal ethics committee of AIIMS, New Delhi. Precorneal tear film levels of genistein was assessed for the period of 4 hrs by LC-MS-MS.

Results: Genistein formulation (0.1%w/v) was sucessfully developed and evaluated. All the physiochemical characteristeics were in range and formulation was found to be stable for 30 days. Further single dose of 0.1% genistein formulation revealed that the genistein was completely eliminated at 4 hours and it maximum concentration tear film was found at 1 hour.

Conclusion: The results showed that 0.1% genistein formulation could be considered as a promising formulation to deliver isoflavones into the ocular tissues, and could have therapeutic potential for sex steroid deficient dry eye in future. Further studies are in progress to prove the concept by using experimental animal models for sex steroid deficient dry eye.

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105PP

Relationship between lung function abnormalities and duration of type 2 Diabetes

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Background: Diabetes mellitus (DM) is a leading health care problem with long term complications. Studies have shown compromised lung function in type-2 DM but there is still paucity of literature on its relation with disease duration. This study was carried out to determine effect of duration of type-2 DM on pulmonary function.

Objectives: We aimed to investigate if any relation exists between deterioration of lung function and duration of disease.

Material and methods: A cross sectional study was carried out on 80 diagnosed type-2 DM patients from the rural population of Sullia who attended KVG medical college OPD, they were non smokers and did not suffer from any cardiopulmonary disease. They were divided in two groups based on disease duration, Group-A had 38 subjects with diabetes for 2-4years and Group-B consisted of 42 subjects with 8-10years of disease. PFT was performed using a digital spirometer (UNI-EM Spiromin). Statistical analysis was done using unpaired t test.

Results: FVC(in L) in Group-A and B was 4±0.67 and 3.06±0.39 respectively with $p<0.0001$. FEV_1(in L) in Group-A and B was 3.6±0.63 and 2.86±0.34 respectively with $p<0.0001$. FEV1/FVC ratio (in %) in Group-A and B was 90.26±5.08 and 93.74±4.2 respectively with $p=0.03$. So, FVC and FEV_1 showed extremely significant decrease, FEV1/FVC ratio showed significant increase and PEFR on the other hand showed no significant change with increase in duration of diabetes.

Conclusion: PFT findings in this study indicate that, as duration of type-2 DM increases, restrictive lung disease becomes more prominent.

106PP

Pulmonary Function Tests in Sweepers of JLNMC Bhagalpur

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This is a crosssectional type of observational study conducted at Jawaharlal Nehru Medical College Bhagalpur on sweepers working in college premises. 15 male sweepers and 15 healthy male controls were selected for the study. Consent was taken for the study. Values of FEF2575% and PEFR were recorded on computerized spirometer and were compared between workers and age matched controls group. The value of FEF2575% and PEFR was significantly reduced in sweepers as compared to controls. Also as the duration of work exposure increases the values of flow rates goes on decreasing among these workers. The smokers show a decline in pulmonary function compared to non smokers. Further the infections may alleiviate the decline in Pulmonary Function Tests. These workers develop lung disorders as indicated by reduced value of FEF2575% and PEFR.

107PP

Monocyte chemoattractant protein-1 gene polymorphism and its serum level have an impact on anthropometric and biochemical risk factors of metabolic syndrome in Indian population

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Background: Monocyte chemoattractant protein-1 (MCP-1), encoded by gene CCL-2 (Chemokine C-C motif 2), is the ligand of chemokine receptor CCR-2. Concurrent clinical alteration in several metabolic aspects, including central obesity, dysglycemia, dyslipidemia and hypertension, is clinically characterized as metabolic syndrome (MetS). Role of MCP-1 in each of these aspects has been established in vitro and in animal studies as well. The aim of this study is to investigate the association of -2518A>G polymorphism of MCP-1 gene and its protein level with the risk of MetS and related clinical / biochemical characteristics in North India.

Methods: We analyzed total 770 subjects (n=386 controls and n=384 MetS subjects) for MCP-1 gene polymorphism using PCR-RFLP and its serum level using ELISA methods. The anthropometric parameters were analyzed by using standard protocol. The biochemical parameters such as serum lipids and plasma glucose were estimated by using semi auto analyzer and insulin level by using RIA method.

Result: The body mass index, waist circumference, hip circumference, waist–hip ratio, blood pressure, serum lipids, insulin and fasting plasma glucose level were significantly high in MetS subjects. Regression analysis showed significant correlation of body mass index, waist and hip circumference, systolic/diastolic blood pressure, fasting glucose, total cholesterol, high-density lipoprotein, low-density lipoprotein fasting insulin and HOMA-IR with MetS. MCP-1 allele and genotype were significantly associated with MetS. Serum MCP-1 level was high in overall cases.

Conclusion: The MCP-1 2518A>G (rs 1024611) polymorphism has significant impact on risk of MetS, and MCP-1 level correlates with anthropometric and biochemical risk factors of MetS.

108PP

A Cross Sectional Study of Pulmonary Function in Carpenters of Guwahati City in Relation to Exposure to Wood Dust

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Background: Among the occupational hazards occupational lung disease captures a remarkable place in respiratory medicines .Wood dust exposure deteriorates pulmonary function and increases the prevalence of respiratory diseases.

OBJECTIVES: 1. To study the pulmonary functions in carpenter in relation to wood dust exposure. 2. Compare the pulmonary functions of carpenter with that of non carpenter.

Material and methods: A cross sectional study among the age group of 20 – 40 yrs of healthy male non smoker , with no skeletal deformity of the chest , with no history of previous major respiratory and systemic diseases consists of 100 each in numbers both in control and study group. Recording of pulmonary functions done by MEDSPIROR. Statistical analysis done by student t test.

Result: Mean and SD value of FVC(liters) , FEV_1(liters) ,$FEF_{25-75\%}$(Litre/Sec) ,PEFR(Litre/min) are as follows respectively .In study group [3.15±0.49 ,2.39±0.49 ,3.60±0.40 ,425.00±46.85] and in control group [3.28±0.35 , 2.83±0.34 ,3.95±0.34 ,449.98±20.90]. Mean value of FVC, FEV_1, $FEF_{25-75\%}$, PEFR decline significantly (P <0.01) in study group compared to control group. Mean value of FVC , FEV_1 ,$FEF_{25-75\%}$,PEFR in group A (1-5 yrs exposure) and group B(more than 5 yrs) as follows

respectively . 3.38±0.25 and 2.93±0.57, 2.69±0.32 and 2.09±0.32, 3.76±0.32 and 3.45±0.43, 445.58±45.41 and 404.42±38.85. Mean value of FVC, FEV_1, $FEF_{25-75\%}$, PEFR decline significantly (P<0.01) in group than with group A.

Conclusion: Chronic exposure to wood dust has a positive impact on pulmonary functions which require periodic health checkup as preventive measure to ensure better health for better work performance.

Key words: Pulmonary functions, Wood dust, Carpenter, FVC, FEV_1, $FEF_{25-75\%}$, PEFR .

109PP

Comparative Study of PEFR and Eosinophil Count In Petrol Pump Workers in Guwahati in Relation to Chronic Inhalation of Petroleum Derivatives

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Background: Workers in the petrol pump stations are chronically exposed to petroleum derivatives through inhalation of volatile fractions of petrol during vehicle refueling which has adverse effects on respiratory and haematopoetic system causing bone marrow depression.

Aims & Objective: To study the Peak Expiratory Flow Rate and Eosinophil count amongst petrol pump workers who are chronically exposed to the hazards of petrol derivatives like benzene and to compare with that of healthy controls.

Materials & Methods: This cross-sectional study was carried out on 50 healthy non-smoker male petrol pump workers aged between 20 to 40 years as cases, working more than 8 years in Guwahati city. 50 apparently healthy non-smoker, socio-economically matched male individuals of the same age group were taken as controls. Medspiror digital expirograph was used to measure Peak expiratory flow rate in both study and control groups. Eosinophil count estimation was done using Haemocytometry (direct method) in the Department of Physiology, Gauhati Medical College, Guwahati.

Results: All the quantitative data were presented as mean(x) ± Standard deviation and were compared using unpaired t-test. The mean values of PEFR (lit/min) were 462.02±15.55 and 476.54±14.22 in the study and control group respectively. Those of eosinophil count (AEC/cumm) were 162.00±67.43 in the study group and 186.00±48.49 in the control group. These show that mean values of PEFR and Eosinophil count were significantly decreased in the test group, with pvalue being less than 0.0001 in case of PEFR and 0.0437 in case of eosinophil count.

Conclusion: This study has suggested that chronic exposure to petroleum derivatives had toxic effects on respiratory and haematopoetic system causing decrease lung function and reduced cell count.

110PP

Study of Pulmonary Function Tests in Response to Localized Cold Stimuli In Age Group between 19-30 Years of Guwahati City

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Background: Cold evokes several responses in the pulmonary mechanics like bronchoconstriction, airway congestion and decreased mucociliary clearance which are a well-studied mechanism to compensate the heat losses in many animals. The study attempts to see the relationship of respiration with cold in human with time

Objectives: In externally controlled environment, we aim to find variation in any pulmonary function parameters in response to cold stimuli.

Material and methods: The variation of pulmonary function parameters in response to a localized cold stimuli which is induced by immersing both feet upto ankle in a bucket with cold water maintained at temperature between 8-10°C in 30 male healthy subjects were noted as baseline; after 2;5 minutes respectively using a Medspiror Electronic spirometer and keeping room temperature at 24° C.

Result: It was observed from ANOVA that the TV increased significantly with time ($p<0.05$) from baseline (0.525±0.20) to 5min (0.647±0.20)during the application of the stimulus. The values of IRV, ERV, and IC showed a gradual increase initially from (1.377±0.49) to(1.39±0.29),(1.20±0.79) to(1.05±0.59) and (1.93±0.39)to (2.04±0.31) respectively and later returned to the baseline after 5min of the stimulus. FVC,FEV1,FEV1/FVC,PEFR showed a gradual significant decrease ($p<0.05$) with time from 3.25±0.39) to (2.97±0.41), (3.03±0.41) to (2.76±0.45) ,(93.1±.5.60) to (92.46±0.45) and (6.17±1.03) to (5.97±1.17) respectively from baseline to 5min primarily due to bronchoconstriction thus showing a positive correlation between these parameters with cold and time.

Conclusion: A significant variation is seen through the study between the different pulmonary function tests exposed to cold stimuli in relation to a specific time showing the multidimensional response of the respiratory mechanics to cold.

111PP

Correlation of pulmonary function tests with duration and glycemic status in patients with type-II DM in Manipur

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Background: Diabetics often present with clinically silent respiratory dysfunction because of significant vascular and ventilation reserves compensating for partial loss of pulmonary parenchyma. Moreover duration and degree of hyperglycemia depicts degree of non-enzymatic glycosylation of connective tissue and degree of microangiopathic complications. Thus, this study will try to fulfil the gap between on-evaluation of pulmonary symptom arising out of long-term hyperglycemia. It is aimed to study the correlation of pulmonary function tests (PFTs) with duration of diabetes and glycemic status among diabetes patients.

Method/procedure: This was a cross-sectional study, carried out in departments of Physiology and Medicine of RIMS, Imphal during the period of July, 2016 – August, 2016 with a study group of 40 T2DM patients, being selected on the basis of American Diabetes Association Criteria and were compared with control group of 40 which were age and sex matched control population. PFTs and glycated haemoglobin (Hb1Ac) were measured by Computerised Spirometer-Model Helios 702, RMS, Chandigarh and ion-exchange resin method respectively. Data were analyzed by SPSS Version 21.

Results: Comparisons of PFTs between cases (n=40) and controls (n=40) were done using student's unpaired t-test, which was found to be statistically more significant for FEV1/FVC ($p<0.0001$) than for FEV1 ($p<0.0001$), FVC ($p<0.0001$). Correlations between PFTs with duration (P=0.379 for FEV1, P=0.295 for FVC) and Hb1Ac (P=0.302 for FEV1, P=0.413 for FVC) levels among cases were found to be insignificant

Conclusion: Poor glycaemic control may cause functional alteration of restrictive type in patients among type II DM but further studies are needed to understand the changes in pulmonary functions among type-II diabetes patients.

112PP

Assessment of change in Pulmonary function parameters in Type 2 Diabetics as compared to Non diabetic Subjects

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Background: Type 2 diabetes mellitus has been a major cause of morbidity and mortality worldwide. It is associated with many complications involving eyes, kidneys, heart and nerves etc. But studies on its pulmonary complications are still facing controversies. So this study is focused on determining whether lung is a target organ for type 2 diabetes mellitus or not.

Objectives: In this study, done on diabetic patients, we aimed to find the effect of type 2 diabetes on pulmonary function parameters.

Material and Methods: The study was done to analyze the pulmonary function parameters in 80 diabetic patients and compare them with age and sex matched 80 healthy volunteers (for control) of age, 43-60 years, by computerized electronic spirometer (Universal Medical Instruments & Electromedicals Spiromin). This was a cross sectional study.

Results: This study clearly showed extremely statistically significant decrease in levels of FVC and FEV1 in type 2 diabetics as compared to controls, whereas FEV1/FVC and PEFR, showed no significant change. The FVC(in L) for diabetics and controls were 3.31±0.7 and 3.96±0.62 respectively with $p<0.0001$. The FEV1(in L) for diabetics and controls were 3.07±0.59 and 3.62±0.72 respectively with $p<0.0001$. Analysis of all parameters was done by independent t-test.

Conclusion: Even though type 2 diabetic patients in this study, did not have any respiratory symptoms, but they did have underlying subclinical restrictive pattern of lung function. So type 2 diabetes mellitus is associated with restrictive pattern of respiratory abnormality.

113PP

Association between serum-CRP and bronchial asthma

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Background: Asthma is a syndrome characterized by airflow obstruction that varies markedly both spontaneously and with treatment. Elevated CRP is known to be a predictor of adverse events in cardiovascular disease and is increasingly used as a surrogate marker of systemic inflammation in diverse conditions. On the other hand, systematic use of spirometry is critical in assessing the severity of asthma. Worldwide studies show that serum-CRP has negative correlation with spirometric lung function, while few other studies show no significant relation.

Objective: To explore whether serum-CRP levels bear any relationship with the severity of bronchial asthma or not.

Materials and methods: This is a cross-sectional study. Total 30 patients of bronchial asthma, of age between 18-65 years and both the sexes attending OPD and ward of Department of Respiratory Medicine, RIMS, Imphal are the study population. Computerized spirometry has been used for doing Pulmonary Function Test. For measuring s-CRP, agglutination test using CRP kit has been used. The study was conducted after the approval from the Institutional Ethics Committee of RIMS, Imphal.

Results: Pearson's correlation coefficient between prebronchodilator FEV1 and CRP level is -.521, the p value being 0.01, which means that there is significant negative correlation between prebronchodilator FEV1 (taken in percentage of predicted value) and s-CRP level.

Conclusion: As FEV1 value directly indicates the severity of bronchial asthma, s-CRP can be considered as a good predictor of bronchial asthma severity.

114PP

Effect of yogic asanas on simple auditory and visual reaction time in nursing students

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Background-Reaction time is one of the measures of cognitive functions. It is a simple means of determining sensorymotor performance. Stress increases anxiety level and sympathetic discharge, thus interferes with performance. Yoga which is a combination of asanas, pranayama and meditation aims to promote healthy lifestyle, thus reducing anxiety. Clinical studies support that yoga alleviate stress and anxiety.

Aim and objectives-In most of the studies subjects practiced both pranayama and asanas. The present study is aimed to find out the relationship between only yogic asanas and their effect on reaction time.

Material and methods- Thirty female nursing students between 20 to 30 years of age have been selected randomly. The students practiced yogic asanas for six weeks. Their auditory and visual reaction time were recorded before and after six weeks of yogasanas practice using a computer program.

Results-Yoga training reduced auditory and visual reaction time, the decrease being statistically significant($p<0.01$).

Conclusion-Thus shortening of reaction time following yogic practices implies improvement in information processing and reflexes.

115PP

Immediate effect of *anuloma-viloma pranayama* on state anxiety and visual perception

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Background: Previous research showed that yoga practice decreased state anxiety and increased the work performance. Another study showed that anxiety increased distraction. Hence, this study was designed to assess the effect of *anuloma-viloma pranayama,* which reduces anxiety on visual perception (requiring attention). The aim of the present study was to assess the effects of *anuloma-viloma pranayama* on visual perception**.**

Material and Methods: Twenty healthy male participants with ages ranging between 20 and 50 years (group mean±SD; 28.4±8.2 years) were recruited. Each participant was assessed in three groups (i) *anulom-vilom pranayama*, (ii) breath awareness, and (iii) quiet sitting. Participants with a minimum three months experience of yoga practice were included and those having any disease or on medication were excluded from the study. Signed informed consent of all participants was taken prior to the study and was approved by the Institutional Ethics Committee. State anxiety of the participants were assessed using Spielberger's state trait anxiety inventory and visual perception using the shape & size discrimination task (Anand Agencies, Pune, India) before and after the intervention. The three interventions were given on three different days to

each participant and allocation to either intervention was alternated. The total time for the each intervention was 18 minutes. Statistical analysis was done using with SPSS version 18.0.

Results: There was a significance reduction ($p<0.01$) in the number of error in shape and size discrimination task after *anuloma-viloma pranayama* and a significant reduction ($p<0.01$) in the level of state anxiety was observed after quiet sitting.

Conclusion: The present study showed that the practice of *anuloma-viloma pranayama* improved visual perception while reducing state anxiety.

116PP

Effect of Yoga bellows type breathing and breath awareness on state anxiety and reaction time

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Background: Yoga breathing and breath awareness had shown reduction in anticipatory responses in reaction time and anxiety has been associated with poor performance in certain tasks requiring attention. Hence this study was designed to assess the effect of bellows type of yoga breathing or *bhastrika pranayama* and breath awareness on reaction time and state anxiety.

Material and Methods: Fifteen healthy female participants with ages between 15 to 27 years (group mean±SD; 19.7±3.5 years) were allocated to three sessions (i*) bhastrika pranayama*, (ii) breath awareness, and (iii) quiet sitting. Participants with minimum 12 months experience of yoga practice were included and those having any disease or who were on medication were excluded from the study. Each session was 18 minutes, on three separate days. Signed informed consent of all participants was taken prior to the study and was approved by the Institutional Ethics Committee. State anxiety was assessed using Spielberger's state trait anxiety inventory (STAI) and reaction time using Multi-Operational apparatus for reaction time (MOART: Lafayette Instrument Company, Model no.35600, USA) with PsymCon. ANOVA was performed using with SPSS version 18.0.

Results: There was a significant decrease in the level of state anxiety after *bhastrika pranayama* ($p<0.001$) and breath awareness ($p<0.05$). Breath awareness showed a significant reduction ($p<0.05$) in reaction time.

Conclusion: *Bhastrika pranayama* and breath awareness reduce the state anxiety. Breath awareness improves reaction time. These practices may be beneficial for mental health and relaxation.

117PP

Effect of short term pranayama among stressful medical students of SAIMS medical college Indore

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Background: Pranayama is known since ancient times to relieve stress and stabilize autonomic function of body. Thestress either physical or mental leads to cardiovascular morbidity .Newly admitted medical students are likely to be exposed to various stresses like change of environment,demanding medical education and different teaching protocol in a medical college.

Objective: To evaluate the effect of pranayama on stress on medical students.

Material and methods: This was a experimental one group pre-post test design. A 12 Item General health questionnaire was used for assessing the

stress level. Total 48 medical students who were interested to take part in the study were selected randomly from Sri Aurobindo Medical College and PG institute Indore(MP)..Before the study pre training for pranayam was given to the study population. Pranayam exercise was performed in the study population for the duration of 1 month. A 12 Item General health questionnaire was used for assessing the stress level before and after 1 month of Pranayam.

Results: In this study 20 males and 28 females were selected. Most of the subject elong to age group 18-25yrs. The mean GHQ score was 9.75±2.26 at baseline and after one month of pranayam it was significantly reduced to 8.9±1.68(p value <0.0001). The Baseline GHQ Score in female was 10.14± 2.5 and that of male was 9.2±1.77 and after 1 month of pranayam excerise it was reduced significantly in both female(9.2±1.75) and males(8.65± 1.53)(P value =0.002, 0.012 respectively).

Conclusion: Pranayam exercise reduces the stress in medical students

118PP

Effect of short-term yoga-based life style intervention on nerve conduction velocity in obesity

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Background: obesity is one of the modifiable risk factors for diabetic neuropathy, which is characterized by decrease in the nerve conduction velocity. Yoga-based life style intervention is reasonably effective to control obesity. Therefore, this study was planned to assess the effect of short-term yoga-based life style intervention on nerve conduction velocity in overweight/obese subjects.

Material and methods: This was a single arm interventional study conducted at Integral Health Clinic, department of Physiology, AIIMS, New Delhi and it included 30 overweight/ obese subjects, mean age 32+ 8 y, BMI 26.78+3.4. Weight, BMI, body fat analysis and nerve conduction velocity of Ulnar and median nerve were assessed at day 0 and after 2 week of yoga-based intervention.

Results: There were significant positive changes in weight (p=0.0001), BMI (p=0.0040), fatness(in %) (p=0.0025) after this yoga intervention. We did not observe any significant changes in nerve conduction velocity of ulnar (p=0.5306) & median (p=0.4675) nerve after the intervention, however, there was a trend in improvement of nerve conduction velocity of median nerve (55.54± 11.48 vs 57.23± 14.23) & ulnar nerve (62.56± 10.83 vs 62.97± 9.820).

Conclusion: Nerve conduction velocity might improve even after a short-term yoga based lifestyle intervention after significant decrease in weight in obesity.

Key words: Obesity, nerve conduction velocity, Yoga

119PP

Effects of yoga in type 2 diabetes mellitus with hypertension: Alteration in RBC morphology as a marker for oxidative stress

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Purpose: Yoga is well known for improving oxygenation to the biological system and combating oxidative stress which is responsible for numerous life style diseases which includes type 2 diabetes

and hypertension. Therefore, the present study was conducted to evaluate the effects of yoga in modifying and improving the quality of life in type II diabetic with hypertension patients.

Methods: An interventional, prospective and open labeled study was done involving 30 patients of type 2 diabetes along with hypertension. Patients received yoga therapy for 45 days along with the standard treatment. Oxidative stress markers such as changes in RBC morphology (crenated edges and Heinz bodies) and malondialdehyde levels along with fasting blood glucose levels, blood pressure, body mass index and symptoms associated with type 2 diabetes were evaluated before and end of the yoga therapy.

Results: Abnormal RBC was markedly reduced as according to the severity ranking assessed after 45 days of yoga therapy. Significant reduction in the levels of malondialdehyde ($P<0.001$), blood glucose ($P<0.0001$), systolic blood pressure ($P<0.001$), diastolic blood pressure ($P<0.05$), body mass index ($P<0.01$) and improvement in the unpleasant symptoms were observed after yoga therapy when compared to same patients before starting yoga therapy.

Conclusion: These findings suggest that yoga intervention has therapeutic, preventive and protective effects in patients having type 2 diabetes with hypertension. This may have direct impact on the dose minimization of the patient which requires further study in this area

120PP

Assessment of arterial stiffness in preeclampsia: a longitudinal study

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Introduction: Preeclampsia (PE) is a leading cause of maternal and fetal death in both developed and developing countries. The present study was conducted to assess the arterial stiffness in preeclampsia and healthy pregnant women during the course of pregnancy.

Methods: Women with singleton pregnancy were recruited in their first trimester and followed up till delivery (n=208). All measurements were performed at three time points i.e. 1st trimester (11-13+5weeks), 2nd trimester (20-22+5weeks), and 3rd trimester (30-32+5weeks). Arterial stiffness indices {augmentation index (AIx) and pulse wave velocity (PWV)} were assessed using applanation tonometry. Out of 208 women, 13 women developed PE while 70 women remained healthy. Rest of the patient data were excluded from the analysis due to complications during pregnancy.

Results: The two groups were similar in age and BMI. AIx@75, carotid radial-PWV and carotid femoral-PWV were significantly higher in preeclampsia (PE) as compared to healthy pregnancy (HP) throughout the pregnancy. After adjustment for SBP, DBP and MBP, AIx@75 was significantly higher in PE as compared to HP only at second trimester ($p=0.0005$, $R2 =0.35$). Carotid radial-PWV was significantly higher at both second ($p=0.002$, $R2 =0.33$) and third trimester ($p=0.002$, $R2 =0.49$), while carotid femoral-PWV ($p=0.02$, $R2 =0.44$) was significantly higher in PE group only at third trimester of pregnancy after adjustment for blood pressure.

Conclusion: Preeclampsia is associated with the higher arterial stiffness which can be observed even before the clinical onset of the disease

121PP

Effect of Emotional Face Word Interference on Behavioural Outcome.

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Background:The phenomena by which emotional stimuli capture attention and disrupt executive performancewhich is manifested as increased reaction time and inaccurate response to the task at hand is known as Emotional Interference.Effective regulation of emotions similarly requires the ability to appropriately detect emotional content and adjust action in order to approach or avoid appetitive or aversive stimuli. In the current study, weinvestigated the effect of endogenous directed attention (instruction for response) on emotional Face Word interference by using Emotional Face-Word Stroop task.

Method: Twenty healthy participants 10 males and 10 females with mean age 25±2 yrs performed an Emotional Stroop Task of Face Word variant.The task was prepared using human faces and words with positive, negative and neutral valence wherein valenced words were superimposed on the faces bearing expressions using E Prime. Reaction time and accuracy for each trial were logged.In the task, the subjects were instructed to respondto the emotion of the face while neglecting the emotion of the word. The task comprised of 60 trials where 30 congruent and 30 incongruent stimuli were presented randomly.

Results: The results were analysed using GraphPad software and reaction time and accuracy was determined. The mean reaction time is 826±110ms. The Reaction Time is not statistically significantly different between incongruent trials (iFWS) and congruent trials (cFWS). The accuracy percentage of incongruent and congruent trials is significantly different (p=0.0079). The mean difference of reaction time is 22.6ms between incongruent trials and congruent trials.

Conclusion: Emotional Interference can be simulated using Emotional Face Word Stroop Task which is manifested as increased reaction time and increased error rate in incongruent trials as compared to congruent trials.

122PP

Cognitive functions in patients of type 2 diabetes mellitus (T2DM) with Diabetic peripheral neuropathy (DPN).

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Background: DPN is one of the most common long term complications of Diabetes mellitus (DM). Patients suffering from DM have shown evidence of cognitive deficits as well. Impaired glycaemic control and longer duration of the disease also increase disease progression to cognitive decline. However, the fact remains unclear that whether DPN provides an early evidence of cognitive abnormalities beyond what is observed in diabetic patients free from such complications.

Objective – To study the cognitive functions in patients of T2DM with DPN and compare them with that of patients of T2DM without DPN and apparently healthy controls.

Method – T2DM patients were divided into two groups with DPN and without DPN by Nerve conduction velocity (NCV). Cognitive functions were tested by using P300 event related potential. NCV and P300 were tested by SCHWARZER TOPAS EMG neurophysiological measuring system. HbA1c was assessed by latex agglutination inhibition assay.

Result –

P300 latency on Pz was significantly delayed in the T2DM with DPN as compared to T2DM without DPN and controls. The average latency is also significantly delayed in T2DM with DPN as compared to controls.

A positive correlation between years since diagnosis of T2DM and HbA1C with P300 Latency was observed.

Conclusion

The above findings suggest that cognitive functions are impaired in T2DM with DPN. Worsening glycaemic index and duration of illness are positively correlated to decline of cognitive functions.

123PP

Protective role of ethanolic extract of Amorphophalus campanulatus tubers on glutathione metabolizing enzymes, pro-inflammatory cytokines and DNA fragmentation in ethanol exposed rats

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Background: Alcohol abuse is currently a worldwide global problem and chronic use leads to the development of a range of symptoms related to liver, called alcoholic liver disease (ALD). The effects of alcohol on long term, is mainly due to development of redox imbalance called oxidative stress in hepatic tissues. Excess free radicals act as signaling molecules to elicit a host of immunologic and inflammatory responses. Currently, in the era of nutraceuticals, the lines of treatment for many diseases are focused on antioxidant property of phytochemicals. So the current study focuses on use of herbal extracts of *Amorphophallus campanulatus* to combat the elicitation of molecular pathways involved in ALD.

Methods: The rats were simultaneously supplemented with ethanolic extract of *Amorphophallus campanulatus* along with ethanol (40%*w/v*) 2gm/kg body weight /day for 30 days to evaluate the changes in glutathione metabolizing enzymes, inflammatory cytokines and apoptotic pathways involved in ethanol toxicity.

Results: Serum pro-inflammatory cytokines, and activity of glutathione metabolizing enzymes like GST and GPx were significantly ($P<0.01$) elevated in ethanol treated animals whereas the activity of GR and G-6-P-D were reduced significantly ($P<0.01$) in the ethanol group compared to control. However, ethanolic extract of Amorphophallus campanulatus (ACE) supplementation to the ethanol treated rats, reversed these effects to normal levels. Furthermore, glycogen and DNA depletion, excess fibrosis due to collagen deposition and increased apoptotic cell number as observed in ethanol treated rats were also restricted by ACE supplementation, with the higher dose being more promising.

Conclusion: The ethanolic extract of ACE possesses anti-inflammatory, anti-apoptotic and antioxidant property against ethanol induced organ damage.

124 PP

A study in change in body weight in patients of pulmonary tuberculosis under supervised and non supervised therapy: A comparison in prognosis outcome

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Background:

Tuberculosis is one of the most prevalent diseases and a major cause of death countrywide, at the same time it is preventable and treatable. A supervised DOTS regimen and non supervised therapy plan are under practice. Prognosis outcome is very important and it depends upon various factors, change in body weight is a very common among them.
Aims and objectives:

This study aims to emphasize the prognostic importance of change in body weight in patients of pulmonary tuberculosis under supervised and non supervised therapy.

Materials and methods:

This study was conducted in the Department of Physiology in RIMS, Ranchi on randomly selected 200 patients of cat – 2 pulmonary tuberculosis. 100 of them were categorised as group – 1 (supervised) who were receiving DOTS regimen of therapy and other 100 were categorised as group – 2 (non supervised) receiving daily regimen of antitubercular drugs. Both the groups were followed after 2 months of therapy for changes in their body weights.

Results:

The mean body weight of group – 1 patients before and after 2 months of therapy were 41.54 kgs and 44.02 kgs respectively showing a mean change of +2.48 kgs whereas the mean body weight of group – 2 patients before and after therapy were 42.81 kgs and 44.42 kgs respectively with a mean change of +2.61 kgs.

Conclusion:

The patients from both the groups with average weight gain of >2 kgs had good prognostic outcome and patients showing weight gain of <2 kgs or having loss of weight had poor prognostic outcome after 2 months of supervised and non supervised therapy.

Keywords: Pulmonary tuberculosis, DOTS regimen, Antitubercular drugs.

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125 PP

Effect of Body Fat% and WHR on Lipid Profile of Healthy Young Students

Dr. Shaikat Mondal

Background and aim: Obesity has become a significant health problem in India affecting all age groups. Dyslipidemia is one of the obesity related co-morbidities. Body fat% and the distribution of adipose tissue have now emerged as critical issues in assessing the link between obesity and metabolic adverse outcomes. So, this study was aimed at finding correlation between Body Fat% and Waist to Hip Ratio (WHR) with Lipid profile of young students.

Materials and methods: A cross-sectional study was done on 64 apparently healthy young adult male subjects aged between 18 and 25 years. Height was measured by 'Stadiometer'. Waist circumference and Hip circumference were measured by 'fiberglass measuring tape'. Body weight and body fat% were measured by 'Omron body Composition monitor HBF-375'. BMI was calculated by Quetlet's equation. Total Serum concentration of triglyceride (TG), total cholesterol (TC), and high-density lipoprotein-cholesterol (HDL-C) were determined by standard enzymatic procedures on empty stomach 12hours after light meal. Data was analyzed statistically in GraphPad Prism software version 6.01 for windows.

Result: Mean age of the subjects was 19.75±1.49. Mean body fat% of subjects was 18.35±6.02 which is in 'average' category and mean WHR was 0.86±0.06. Total body fat% has a positive correlation with TC (r= 0.4808, p<0.0001) and TG (r=0.3533, p<0.0042). We found a strong negative correlation of Fat% with HDL-C (r= -0.8962, p<0.0001). WHR has a positive correlation with TC (r=0.5669, p<0.0001) and TG (r=0.3406, p=0.0059) and a negative correlation with HDL-C (r=-0.5691, p<0.0001).

Conclusion: Increase in body fat% and WHR are indicator of increase in Total cholesterol as well as Triglyceride. HDL-C is decreased with increased obesity in terms of both fat% and WHR.

Keywords: Body fat%, High-density lipid Cholesterol, Lipid profile, Triglyceride, Waist to hip ratio.

Thank You