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SYMPOSIA ABSTRACTS

Symposium 1 (S1): Neuroinflammation and Brain Cancer

S1/01

Deciphering the Molecular Mechanism Underlying IL-1 β Induced Inflammation in Microglia

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Neuroinflammation being the first line of defense in the CNS, behaves as a double-edged sword. It occurs in response to trauma, infections and/or, neurodegenerative diseases and helps in neuroprotection but exaggerated inflammatory response may exacerbate CNS injury leading to neurodegeneration. IL-1 β , which is a potent pro-inflammatory cytokine secreted by activated microglia in response to pathogenic invasions or neurodegeneration, is also known as “the master regulator of inflammation”. It initiates a vicious cycle of inflammation and orchestrates various molecular mechanisms involved in neuro-inflammation. The role of IL-1 β , has been extensively studied in neurodegenerative disorders. However, the mechanisms leading to its production and downstream signaling cascades are still poorly understood. The objective of our study is the comprehensive identification of different molecular pathways involved in IL-1 β induced inflammation through protein profiling.

To achieve our aim, we performed the proteomic profiling of the N9 microglia cells with and without IL-1 β treatment and identified the differentially expressed protein spots with the help of MALDI-TOF MS/MS. We observed that the proteins being affected by IL-1 β administration in microglia are involved in various cellular stress pathways, for instance, unfolded protein response (ER stress), oxidative stress, apoptosis and cytoskeleton proteins. We hypothesize that these stress pathways further affect the microglial cellular machinery and may lead to the increase in the severity of neuro-inflammation.

To study this, we are now interested to see the role of HSP60, an important mitochondrial chaperone, which was identified by the proteomic profiling of microglia upon IL-1 β induced inflammation, in the progression of neuro-inflammation. HSP60 has been reported to be involved in microglia activation in response to neurodegeneration by a TLR4-Myd88 dependent manner, but the knowledge of underlying molecular signaling pathways is lacking. We are, therefore, interested to study that how HSP60, upon activation by IL-1 β treatment, helps in stimulating the process of neuro-inflammation, for this we will be

knocking down and overexpressing the same to check its role in inducing inflammation.

Our study will enable us to understand the overall molecular mechanistic study of neuro-inflammation and will fill the gaps in our understanding of the same. Elucidation of the detailed mechanism of IL-1 β mediated inflammation will help the neurobiologists to focus on novel approaches for therapeutic applications.

S1/02

Inflammation to Tumor Progression: Retracing the Journey

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Emerging evidences indicate that inflammation contributes to initiation and/or propagation of a wide range of cancers. The increased presence of pro-inflammatory mediators in the tumor microenvironment plays a major factor in inducing malignancy. Given the unequivocal acceptance of the role of inflammation in cancer, our studies are directed towards understanding how inflammation regulated signaling network and chromatin dynamics affect genes associated with survival, resistance to chemotherapeutics and immune evasive responses in one of the most malignant of human tumors- Glioblastoma multiforme (GBM).

S1/03

NLRs in the Brain: A Double Edged Sword

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The NLR (nucleotide-binding domain, leucine-rich repeat containing) gene family is a recently discovered family of more than 20 genes that consist of important regulators of inflammation and immunity. NLR gene family members show significant genetic linkage to several chronic human immunologic diseases (including crohn’s disease, vitiligo and asthma), and play key roles in immune regulation to pathogens and injury. My talk will focus on our past discovery of the role of NLR family members in multiple sclerosis as well as our current interest of the role of NLRs in glioma pathology.

S1/04

Vascular Endothelial Protection after Ischemic Stroke

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Background: Blood-brain barrier (BBB) disruption following stroke causes cerebral edema and sometimes haemorrhagic transformation. However, current therapy remains unsatisfactory to ameliorate such cerebral injury.

Methods and Results: Middle cerebral artery occlusion (MCAO) was performed on rats to create the stroke model. Immunohistological studies revealed that upregulation of TRPM4 in vascular endothelium occurred as early as 2 hours after stroke, peaked at 1 day and decreased gradually. With TRPM4 inhibition by *in vivo* siRNA, vascular endothelium was well protected against ischemia for up to 1 day. Meanwhile, motor functions were improved in both permanent and transient MCAO rats receiving TRPM4 siRNA. However, the therapeutic effect lasted longer in transient MCAO than in permanent MCAO. Moreover, MRI imaging showed that cerebral edema was markedly reduced after reperfusion, and PET scan indicated an improvement of FDG uptake. Importantly, severe BBB damage was alleviated by TRPM4 inhibition.

Conclusions: After stroke onset, blocking TRPM4 can ameliorate BBB damage by protecting vascular endothelial cells. Therefore, TRPM4 is a therapeutic target for ischemic stroke treatment.

S1/05

Monotonous Environment and Isolation Stress Induces Early Mood Behavioural Changes due to Altered Hippocampal Synaptic Plasticity

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Social isolation stress and its effect on mood have been well reported, but the role of monotony (a state of repetition of events for a considerable period of time without variation) on mood with synaptic plasticity is limiting in the literature. Present study aimed at evaluating the mood status and its possible correlation with altered hippocampal synaptic plasticity following exposure to monotony stress in rat models. Male Sprague-Dawley rats were subjected to monotony through physical, auditory, visual and pheromonal separation in a specially designed isolation chamber.

Fluoxetine (selective serotonin reuptake inhibitor) was administered orally. Behavioural assessment by open field, elevated plus maze and forced swim test showed anxiety and depression like traits in animals subjected to monotony. Pyknosis along with decrease in apical dendritic arborization and increase in asymmetric (excitatory) synapses with the corresponding decrease in the symmetric (inhibitory) synaptic density was observed in the hippocampal CA3 region of singly housed (monotony) rats. This findings were further correlated with decrease in serotonin level and reduced expression of synaptophysin and pCREB in the hippocampus. Fluoxetine administration during social isolation resulted in amelioration of altered mood along with improvement in serotonin and decrease in excitatory synaptic density but no change in inhibitory synaptic density was observed in the hippocampus. These findings suggest that monotony during isolation contributes to impairment in mood state by altering the hippocampal excitatory and inhibitory synaptic density.

Key words: Monotony; Social isolation stress; Mood alteration; synapse; Fluoxetine

S1/06

Chitotriosidase- A Novel Molecule in Neuroinflammation

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Neuroinflammation has become the flavour of the month in Neuroscience as reflected by 100s of papers presented on this subject in the recently concluded annual meeting of Society of Neurosciences (SFN) held in Chicago. It is implicated in Alzheimer's, Parkinson's and motor neurone disease, epilepsy, stroke, brain tumours to name a few. Our work on Amyotrophic Lateral Sclerosis (ALS), which is a predominant form of motor neurone disease shows that ALS is an augmented neuroinflammatory disease. Our proteomics study followed by ELISA of Cerebro Spinal Fluid (CSF) from ALS patients (ALS-CSF) clearly demonstrate that Chitotriosidase (CHIT) level is increased significantly in the CSF of patients compared to CSF obtained from control subjects. CHIT is secreted by microglia, which in turn can have a profound effect on further activation of more microglia and astrocytes. This results in the enhanced production of pro inflammatory cytokines including IL6, TNF α and IFN- γ , inflammatory markers like COX2 and PGE2, and toxic factors like reactive Oxygen and Nitrogen species. Good Samaritans including VEGF and GDNF, the beneficial trophic factors; and IL10, an anti-inflammatory cytokine, are down regulated in the glial cells. CHIT is well known in the literature for its role in peripheral inflammation. However, its role in neuroinflammation is just beginning to emerge.

My talk would focus on the possible role, CHIT can play in bringing about degeneration of motor neurones in ALS.

S.2: Discovering the Mystery of Sleep

S2/01

Sleep in Schizophrenia: A window to understand the dysfunctional brain mechanisms

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Abstract

Sleep initiation and maintenance abnormalities have been considered as an intrinsic feature of schizophrenia (SCZ). Many studies have demonstrated various sleep abnormalities in schizophrenia, that include prolonged periods of sleeplessness, frequent intermittent awakenings, long sleep onset latency, increased N1 duration, reduced N2 duration and N3 and REM sleep alterations leading to overall poor sleep efficiency. However, a better understanding on sleep cycle dynamics would provide relevant details with regard to dysfunctional thalamo-cortical synchronizing mechanisms associated with sleep initiation and maintenance and are thought to be fundamental to schizophrenia pathophysiology. We have demonstrated transient features of sleep instability in SCZ patients such as significantly increased intermittent awakenings and exaggerated stage transitions in NREM and REM sleep-periods etc indicative of sleep initiation disturbances as well as sleep stage instability, leading to abnormalities in sleep maintaining mechanism in SCZ patients. In addition we have also observed persistent spindle deficits across sleep cycles together with increased beta power. Such sleep cycle specific instability are suggestive of unstable thalamo cortical mechanisms that would provide us opportunity to understand the pathophysiology of schizophrenia and hence in the management of the disorder from a sleeping brain perspective. Recent studies have also highlighted the importance of thalamo cortical mechanisms associated with experiencing the sense of self which is compromised in schizophrenia.

Acknowledgement: The present study is a part of the Ph.D study of Dr. Arun. Duly acknowledge the support of Dr. John P. John, Professor, Dept. of Psychiatry, NIMHANS as research collaborator of the study.

S2/02

Sleep Loss during Pregnancy and Cognitive Deficits in Offspring: Recent Evidences

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Background: Sleep loss during pregnancy is an emerging health concern as developing fetal neural networks are highly vulnerable to maternal sleep loss and are at a high risk predisposition to various anxiety disorders/ learning disabilities in growing children.

Objectives: In strictly controlled experiments in animal model, we aimed to investigate role of different components of sleep in modulating the neural plasticity in the developing brain.

Material and methods: The effects of sleep deprivation (Rapid eye movement (REM) sleep of 20 h or total sleep of 5h) in female Wistar rats during third term of pregnancy were tested on the cognitive development in their offspring.

Results: The REM sleep deprivation during third trimester of pregnancy impaired the maternal behavior during first post-partum week. Litters born to these dams showed significant lower body weights during entire development and had lesser vocalizations in comparison to control pups. However, neonates from total sleep deprivation of 5h in dams displayed increased vocalizations and high risk-taking behavior during adolescence. The ontogenetic profiles of sleep-wakefulness in these neonates provided further evidences on altered neural development.

Conclusion: The alterations in emotional and sleep-wakefulness profile in the neonates indicated that maternal sleep is an important factor in modulating the cognitive development of infants.

S2/03

The Preoptic Area in Sleep: Past, Present and Future

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Past: The role of the preoptic area (POA) in sleep was first described by Von Economo in 1930 on the basis of his observations and post mortem findings in *Encephalitis lethargica* patients...Symptoms of insomnia and excessive sleep in these patients were correlated with the lesion in the POA and posterior hypothalamus respectively. These findings were later confirmed in rats by Nauta's knife cut

studies in 1945. The emergence of the POA in neural mediation of sleep was eclipsed the ascending reticular activating system sleep-wake mechanism in 1949 and the discovery of rapid eye movement sleep in 1953. In between 1960-1970, stimulation and lesion studies by Sterman and Clement further strengthened the role of preoptic area in sleep. During intervening 25 years (1980-2005) we have convincingly demonstrated the role of the medial POA in maintenance as well as generation of slow wave sleep using lesion, stimulation, neural transplantation and functional MRI studies.

Present: The discovery ventrolateral POA (VLPOA) in 1996 not only renewed the interest in POA but also awarded its due recognition after 80 long years as the principal neural structure regulating slow wave sleep. It is needless to say that the VLPOA is a group of neurons within the POA. **Future:** Recent demonstration of the role median preoptic nucleus in sleep indicates that in future more neural structures mediating sleep will be discovered in addition to VLPOA and MNPOA which are currently advocated as the centre stage of sleep regulation. These arguments emphasize the relative importance localized brain region in sleep regulation. The pons, thalamus, neocortex and the POA other than the VLPOA do play important role in neural control of sleep. It is time to realize that a fundamental behavior like sleep-wake is organized at all level of neuraxis and not just at a particular locus.

S2/04

The Role of Sleep in the Consolidation Conditioned Memory

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It still remains an enigma that why do we sleep? It is believed that the different sleeping stages such as Non-Rapid Eye Movement (NREM) sleep and REM (Rapid Eye Movement) sleep, possibly, together or individually, provide optimal conditions for the consolidation of certain learning tasks. For example, improvement in the visual texture discrimination task correlates with the levels of both the sleep states: REM and NREM sleep, while improvement in the motor sequence task and the motor adaptation task correlates with NREM sleep only. However, the role of sleep in the consolidation of several other types of memory such as associative memory is not clearly known.

After a series of experiments, we have recently observed that the consolidation of associative memory is also sleep-dependent and requires augmented sleep. Further, we have observed that the changes in sleep architecture are an explicitly consolidation dependent phenomenon. In addition, we have found that both sleep deprivation along with alteration in the circadian timing contribute at larger

scale in impairing consolidation of associative memories. Further, our results suggest that sleeping brain possibly helps activate the underlying protein synthesis/gene expression machinery during sleep.

In addition, sleep is thought to consolidate changes in synaptic strength, but the underlying mechanisms are unknown. We investigated the cellular events involved in this process during ocular dominance plasticity (ODP), a canonical form of in vivo cortical plasticity triggered by monocular deprivation (MD) and consolidated by sleep via undetermined, activity-dependent mechanisms. We find that sleep consolidates ODP primarily by strengthening cortical responses to non-deprived eye stimulation. Consolidation is inhibited by reversible, intracortical antagonism of NMDA receptors (NMDARs) or cAMP-dependent protein kinase (PKA) during post-MD sleep. Consolidation is also associated with sleep-dependent increases in the activity of remodeling neurons and in the phosphorylation of proteins required for potentiation of glutamatergic synapses. These findings demonstrate that synaptic strengthening via NMDAR and PKA activity is a key step in sleep-dependent consolidation of ODP.

Our results suggest that sleep plays an instructive role in the consolidation of associative memory and neuronal plasticity.

S2/05

Our Responsibility for Sleep Health

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The present generation gets 20% less sleep, compared to those about two generation back. This is attributed to electrification of homes, offices and streets. Excess television watching, use of computers, mobiles and iPads are linked to delayed sleep onset, and reduced time in bed. Night-shift workers (including truck drivers) get an average of 1-2 hours less sleep per 24 hours. Lack of sleep impairs attention, alertness, concentration, reasoning, and problem solving. Lack of sleep makes it more difficult to learn efficiently. Sleep deprivation and sleep disorders can contribute to depression, which can make it more difficult to fall asleep. Lack of sleep can affect even moral judgments. Chronic sleep loss and sleep disorders are risk factors for heart diseases, high blood pressure, stroke and diabetes.

Sleep/awake complaints are the second largest ailments seeking medical attention in USA. Initiatives are required to improve public awareness about sleep science and medicine in India. There should be increased awareness among teachers and school children on importance of sleep. We need to educate the doctors in sleep medicine. Advancement in sleep research is a must. Studies on

genetic and biochemical markers of sleep disorders will help in detecting sleep problems at an early stage. There is a vast scope for research on traditional medicines for sleep. Close collaboration between basic science and sleep medicine should be encouraged. We need to bring down the cost of diagnosis and treatment of sleep disorders. Training of technical personnel is an unavoidable requirement for any advancement in sleep medicine.

S.3: Biomedical Signal Processing.

S3/01

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S3/02

Biomedical Signal Processing: The need for Continuous Training

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We are aware of the growing importance of medical instrumentation in improving the health care delivery and advancement in science in the country. Advances in electronics, computers, and medical informatics have enabled development of state of art equipment with better man-machine interface and high level of digital signal processing. Now the machines have improved capability for sensing, detection, automatic diagnosis, auto-calibration and failure diagnosis. Currently, several machines incorporate intelligent systems using artificial intelligence. As the industry moves towards high technology products, a compatible training program needs to be put in place for users. In order to give a thrust to this activity, we require concerted efforts among academic institutions, industry and medical professionals to understand the systems effectively.

Despite the rapid growth of medical instrumentation, the physiologists, pharmacologists and other professionals are not given regular updates and structured training program in biomedical signal processing. There has been some kind of inhibitions towards signal processing and interpreting the physiological equations. The present symposium is planned to keep pace to perceived demand due to requirement of diverse variety of medical instruments and newer signal conditioning analytical packages. Institutions involved in R&D activity generally complain that the younger generation is not well trained in handling equipment and data in an efficient manner. The present symposium is one step ahead in this direction.

There is, therefore, an imperative need to create awareness and regular training in biomedical signal processing. There is hardly any doubt that if we impart training to scientists, some may become leaders and pioneers in this field.

S.4: Clinical Exercise Physiology

S4/01

Scope of Physiologists in Exercise Research and Management of Lifestyle Disorders

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With advancement of medical science and improvement of healthcare system, the global burden of disease is shifting from infectious diseases to non-communicable diseases (NCDs) like diabetes mellitus, heart disease and obesity which are now the chief causes of death globally. Habitual physical activity is one of the most important tool that can be used for promoting primary and secondary preventive care in community and clinical set-up. Frequent and regular exercise not only prevents but also can reverse and modify the deleterious effects of various NCDs. Therefore, incorporating “Exercise as a Medicine” proves to be very effective and important therapeutic and preventive module for NCDs. But physical activity has traditionally been coupled with other public health agendas and often not fully recognized as a stand-alone, public health priority. Everyday, patients from various clinical disciplines in hospitals are prescribed multiple modules of preventive, curative and rehabilitatory physical activity; however, there is paucity of clinical exercise physiologists and not much research has been done in the field of clinical exercise. Introduction of “accredited clinical exercise physiologists”, who are the specialists in exercise interventions and physical activity education into primary health care settings, has the potential to greatly enhance existing health care delivery. This can be achieved through inter-professional practice; referring patients to the clinical exercise physiologists which will ensure tailored exercise prescription and create a focus on behaviour change as the core component of both the prevention and management of NCDs. Clinical exercise physiology practice can open up many avenues for inter-departmental research activities and is one of the strongly felt need of the hour.

S4/02

Exercise and Mental Stress: A Paradoxical Relationship

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Participation in sports and physical exercise is said to be critical towards maintaining and enhancing physical health. Exercise is also beneficial to mental health mood and cognition whereby it reduces stress, decreases anxiety, and alleviates depression. However, sports has greater component of stress, being a competitive activity. In this regard, effect of training, overtraining, fatigue and type of sports has significant modulations on mental stress level mainly depending on the intensity. On the other hand, several reports indicate non-competitive exercise or informal sports for recreation is generally beneficial for mental health. Thus, for example, it was found that sub-optimal exercise prevented mental stress-induced endothelial dysfunction among subjects with Metabolic Syndrome, and an increase in shear rate during exercise mediated this effect. Citing recent specific studies, sedentary women with high stress levels, displayed positive affective responses when walking on treadmill at intensities lower than their ventilatory threshold which was importantly related to self-paced exercise in contrast to imposed exercise regimes. In this context, our own studies comparing responses of neural substrates and psychological measures of state & trait anxiety pre- and post exercise revealed significant attenuation of baseline anxiety with corresponding changes in EEG wave patterns, However, gender specific differences were found to exist predominantly in the psycho-neurophysiological response pattern in females, indicating a positive affect at rest in female as compared to males. In both the genders, the anxiety was reduced after acute aerobic exercise. However, only male supported the prediction of cerebral lateralization hypothesis that anxiety reductions caused by exercise is due to decrease in right, relative to left, hemisphere activation. On the other hand, adverse effects of intensive exercise or sports are evident in over-reaching marathon runners and triathlon competitors who suffer from chronic mental fatigue and stress related to long term physical damage or injuries. In this context, several studies on Gulf War military personnel who underwent intense and chronic physical and/or mental activity showed that nearly 30% of them have developed Gulf War Illness, a condition that presents with increased symptoms of impairment of cognitive functions, autonomic dysfunction, chronic pain & fatigue implicating the central nervous system, with generalized malaise. Thus, an optimal range of physical mobilization with beneficial mental engagement remains a multifactorial issue which encompasses, gender, age, lifestyle, diet, training, type & intensity of activity and personality & genetic build of an individual.

S4/03

Topic: Experimental Exercise Physiology: From Animal Research to Clinics

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In the present era, the non communicable diseases (NCDs) have taken over a quite large proportion of the disease burden which can be prevented and managed by effective lifestyle modifications like appropriate, tailored and effective exercise modules. Among the various exercise modules, habitual physical activity are indeed frequently prescribed in clinical set up for NCD patients. The long term beneficiary effects of exercise in various forms on health and disease are very often studied and practiced in human beings. These studies should be conducted in animal models (rat & mice) in laboratory set up which has certain advantages over humans. The exercise modules before being prescribed as preventive or therapeutic measure should be supported with enough evidence on experimental animals in laboratory set up. In fact in some disease models like diabetes, obesity, hyperlipidemia or other metabolic syndromes and drug effects where the effect of exercise on gene modification are studied, the animal models prove to be superior than humans. The various epigenetic regulations of exercise and its inheritance to subsequent generations can be studied on animal models which is a major limitation in human studies. There are also documented benefits of exercise in rehabilitating the paralysed patients to recover from traumatic or other neuronal disorders where again animal models are considered superior to study and devise the rehabilitation protocols. However, there is paucity of research on animal models showing the various epigenetic regulations and behavioural changes brought by exercise modules. Therefore, research on animal models should be encouraged in order to create a larger scope for the exercise physiologists to translate them in to clinics.

S4/04

Health, Fitness and Mind body Medicine: Clinical relevance in Metabolic Disorders

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There has been an alarming increase in non-communicable diseases (NCD) worldwide in the recent decades due to the adoption of modern lifestyle, unplanned urbanization, dietary changes, physical inactivity, socio-economic

changes and accompanied stress. South-East Asian population including Indians have genetic vulnerability due to which they have altered body composition and higher risk of CVD and diabetes at least one to two decades earlier than the western population. Recommended physical activity (PA) guidelines for Indian adults should be 60 min every day that include at least 30 min of moderate-intensity aerobic activity, 15 min of work-related activity and 15 min of muscle strengthening exercises. Comparative data show that Asian Indians are more sedentary than white Caucasians and do not perform minimum PA recommendations. Physical inactivity is associated with at least twofold increase in the risk for coronary events. PA reduces all-cause mortality, incidence and fatality of CHD, reduces risk of NIDDM, reduces BP, improves biochemical profile, psychological wellbeing, important component in weight loss regimens and PA benefits occur at any age. There is an urgent need to use non-pharmacological interventions including higher level of PA in the form aerobic exercise, yoga and meditative techniques for bringing positive health in the large masses of population. In the recent decades, interest has been increasing all over the world in utilizing the applications of yogic techniques in the field of therapeutics and research. Yoga and meditation can act as a viable, economic, community based and culturally accepted tool for bringing positive health in the Indian community.

S4/04

Therapeutic Exercise in Disease and Cross-training in Sports Physiology

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Therapeutic Exercise can be defined as any bodily movement prescribed to improve one's musculoskeletal function so as to return a person convalescing from a disease or impairment, to maximum possible physically active state of well-being. It encompasses any type of general, mild to vigorous, whole-body physical activity or selected activities restricted to specific muscle groups. It is aimed at achieving and maintaining physical fitness by the following mechanisms: restoring movement and enabling ambulation; releasing contracted muscles and mobilizing the joints to reduce rigidity; improving circulation and respiratory capacity to improve exercise performance and functional capacity; improving balance and coordination and promoting relaxation. Therapeutic exercise can be broadly classified into the following types: endurance training, resistance training and flexibility training. Therapeutic exercise is of great rehabilitative utility in patients suffering from chronic metabolic diseases, cardiovascular diseases, rheumatologic impairments and neurodegenerative diseases, and has to be individualized

based upon the prior physical state of the patient and the ongoing pathophysiological changes in them.

Cross-training is a method of training adopted by sports and military personnel to achieve holistic conditioning of all musculoskeletal groups, by undergoing more than one type of sport specific physical training, with a goal of improving overall performance. It is devised to take advantage of the particular effectiveness of each training method, thereby providing whole-body conditioning and improvements in strength, while at the same time attempting to negate the shortcomings of each method by combining it with other methods that address its weaknesses. The main advantages of cross-training are: whole-body conditioning, injury prevention and active recovery from primary training.

S.5: Parkinsonism

S5/01

Deep Brain Stimulation in Parkinson's Disease: Ethical Issues

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Deep brain stimulation (DBS) is a surgical procedure used to treat several disabling neurological symptoms—most commonly the debilitating motor symptoms of Parkinson's disease (PD), such as tremor, rigidity, stiffness, slowed movement, and walking problems.

The DBS system consists of three components: the lead, the extension, and the IPG. The lead (also called an electrode)—a thin, insulated wire—is inserted through a small opening in the skull and implanted in the brain. The tip of the electrode is positioned within the specific brain area.

The extension is an insulated wire that is passed under the skin of the head, neck, and shoulder, connecting the lead to the implantable pulse generator. The IPG (the "battery pack") is the third component and is usually implanted under the skin near the collarbone. In some cases it may be implanted lower in the chest or under the skin over the abdomen.

Once the system is in place, electrical impulses are sent from the IPG up along the extension wire and the lead and into the brain. These impulses block abnormal electrical signals and alleviate PD motor symptoms.

There are three brain targets that have been FDA approved for use in Parkinson's disease. The most commonly utilized brain targets include the subthalamic nucleus (STN) and also the globus pallidus interna (GPi).

Although the picture is not yet clear on the issue of target choice, the STN does seem to provide more medication reduction, while GPi may be slightly safer for language and cognition.

Research is on DBS to determine its safety, reliability, and effectiveness as a treatment for PD. Bilateral DBS showed overall superiority to best medical therapy at improving motor symptoms and quality of life.

S5/02

Parkinsonism

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Parkinsonism, also known as “atypical Parkinson’s,” “secondary Parkinson’s,” or “Parkinson’s syndrome,” which is a neurological syndrome in which a patient exhibits some of the symptoms associated with Parkinson’s disease i.e. RIGIDITY, Akinesia, Tremors with postural instability. But Parkinsonism is not Parkinson’s disease. Parkinsonism is not thought to be caused by Parkinson’s disease and patients typically respond poorly to pharmacologic intervention. Parkinsonism often has an identifiable cause, such as exposure to toxins, methamphetamine, trauma, multiple strokes, other nervous system disorders or illness. Generally, Lewy bodies are not seen in Parkinsonism. But in Parkinson’s disease, the trigger of dopaminergic degeneration seems to be multifactorial i.e. affected by both endogenous and environmental elements. Inflammation and immune responses are increasingly being considered as important mediators of dopaminergic degeneration. Lewy bodies are abnormal aggregates and inclusions of protein that develop inside nerve cells in people with Parkinson’s disease. The aggregations usually consist of insoluble fibrillary aggregates containing misfolded proteins. The term *parkinsonism* is also associated with disorders such as progressive supranuclear palsy, multiple system atrophy, Lewy body dementia, corticobasal degeneration, vascular parkinsonism, drug-induced parkinsonism, and parkinsonism secondary to infection and other causes. A form of reversible parkinsonism can occur from the use of certain neuroleptic drugs, particularly reserpine, antipsychotics (haloperidol), and metoclopramide. Exposure to certain toxins, severe carbon monoxide poisoning, and mercury poisoning can also lead to Parkinsonism. The chemical MPTP as an agent that causes parkinsonism syndrome in nonhuman primates as well as in humans. MPTP can be produced when making a form of heroin (MPTP is converted to a neurotoxin that selectively destroys dopamine cells in the substantia nigra). These cases are rare and have mostly affected long-term drug users. Methamphetamine abuse has also been linked to

parkinsonism. Patients with parkinsonism are often difficult to manage as outpatients. The complexity of their symptoms, the added cognitive and autonomic deficits, the poor response to most PD medications, and the relatively rapid decline in status contribute to the challenges in managing these patients, particularly as the disease progresses.

S5/03

Peripheral Biomarkers in Parkinson’s Disease

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Parkinson's disease (PD) is a progressive neurodegenerative disease of central nervous system, occurs due to the loss of dopaminergic neurons in the substantia nigra pars compacta. The role of alpha-synuclein, matrix metalloproteinases (MMPs) and NF- κ B in PD has not been consistently proven yet. Inconsistency in the results achieved by the researchers might be due to the subjects from different countries or differences might be resulted from inclusion criteria for study subjects or the number of subjects and sensitivities of the different assays etc. Thus, population based studies are needed to find out the role of these biomolecules on the risk of PD. The purpose of the present study was to evaluate the levels of alpha-synuclein, matrix metalloproteinase-1 (MMP-1) and matrix metalloproteinase-3 (MMP-3) and NF- κ B in PD patients and matched controls.

A total of 194 subjects (PD=97, Controls=97) have been included in the present study. The quantitative determination of serum alpha-synuclein, MMP-1, MMP-3 and NF- κ B were done by using enzyme linked immunosorbent assay (ELISA).

Serum MMP-3 was higher in PD patients than controls and the difference was statistically significant, whereas MMP-1 was found to be significantly decreased in patients with PD. However, the levels of alpha-synuclein and NF- κ B were lower in PD patients than controls, but the differences were not statistically significant.

Significantly altered levels of MMP-1 and MMP-3 indicated that these might play diagnostic role in PD, whereas non-significant difference in the levels of alpha-synuclein and NF- κ B between PD patients and controls indicated that these were not important biomarkers for PD in study subjects.

Keywords: Alpha-synuclein, MMP-1, MMP-3, NF- κ B, ELISA

S.6 : Pulmonary Function Test

S6/01

Spirometry in Clinical Practice

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Spirometry is the one of the commonest diagnostic tests to be advised in patients suffering from respiratory diseases. It is used to evaluate the cause of breathlessness, assess baseline lung function, monitor effects of therapy, evaluate operative risk and perform surveillance for occupational-related lung diseases. A spirometer is a device that measures the amount of air a subject inhales or exhales and the rate at which the air is moved into or out of the lungs. Spirograms are tracings or recordings of the information obtained from the test. It is usually a forced expiratory maneuver. A number of physiologic factors influence the gas flow during this maneuver and are broadly divided into two groups : (1) Mechanical properties of the lung ,(2) Resistive elements. In this session we shall discuss the physiology behind spirometry, dos and don'ts while performing the procedure, examples with different clinical case scenarios etc.

S6/02

Pulmonary Function Tests- an overview

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Pulmonary function tests (PFT) are designed to identify and quantify abnormalities in lung functions. Although not diagnostic *per se*, these tests aid the clinician to reach a diagnosis, to evaluate the efficacy of treatment and eventually the prognosis of the disease.

PFTs are broadly categorised to test-

1. Mechanical ventilator functions of lung / Chest wall
2. Gas- Exchange
3. Cardiopulmonary Interaction

The mainstay of the PFT remains Spirometry that assesses the integrated mechanical function of the lung, chest wall and respiratory muscles by measuring the different volumes

of air exhaled. The residual volume that cannot be exhaled and hence determined by spirometer, can be measured by Helium dilution or Nitrogen washout techniques. Body Plethysmography is another non invasive method to determine the different lung volumes and capacities.

Diffusion Capacity of lungs for Carbon Monoxide (DLCO) is another PFT to test the surface area available for gas diffusion; helpful for evaluating the presence of possible parenchymal lung disease when spirometry and lung volume determinations suggest a reduced vital capacity, RV, or TLC.

Cardiopulmonary exercise test (CPX) measures the integrated response of the pulmonary, cardiovascular, and muscular systems to a steadily increasing workload. The test may be performed on a bicycle ergometer or treadmill.

Arterial Blood Gases are used in the evaluation of ventilation, oxygenation, and acid-base status.

Assessment of Respiratory Muscle Strength by Maximum inspiratory pressures (MIP), maximum expiratory pressures (MEP); Methacholine Challenge Testing for confirming the diagnosis of asthma; Pulse oximetry to test the saturation of oxygen and Exhaled Nitric Oxide are some other pulmonary function tests in practice.

S6/03

Lung Volumes & Diffusion Studies

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Lung volume measurement and diffusion studies form an important constituent of a modern, advanced PFT laboratory. Estimation of lung volumes is essential for analyzing lung function and providing supplemental information which is not furnished by conventional spirometry. It is especially useful in the evaluation of restrictive lung defects. Diffusion studies are a measure of the transfer of gases between the alveoli and the pulmonary capillary blood. Because carbon monoxide is utilized in these studies, the term used is "diffusion capacity of the lung for carbon monoxide (DL_{CO}). DL_{CO} may be altered in various physiological and pathological states. The present discussion shall focus on the very basics underlying these measurements and related clinical and practical aspects.

S6/04

Cardiopulmonary Exercise Testing

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Cardiopulmonary exercise testing (CPET) has become an important clinical tool to evaluate exercise capacity and predict outcome in patients with heart failure and other cardiac conditions. It provides assessment of the integrative exercise responses involving the pulmonary, cardiovascular and skeletal muscle systems, which are not adequately reflected through the measurement of individual organ system function. CPET is being used increasingly in a wide spectrum of clinical applications for evaluation of undiagnosed exercise intolerance and for objective determination of functional capacity and impairment. This presentation focuses on the exercise physiology and physiological basis for functional exercise testing and discusses the methodology, indications, contraindications and interpretation of CPET.

S.7 : Ethics

S7/01

Ethics of Biomedical Research

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The part of philosophy which focuses on the principles involved in making decisions about what is right and wrong is called Ethics. Bioethics concerns ethical issues that arise in relationships among life sciences, biotechnology, medicine, politics, law, philosophy and theology. The modern field of bioethics first emerged as an academic discipline in the 1960s. Bioethicists study ethical decision making in the context of biological information and technology. Traditionally, they dealt only with difficult medical decisions. With the current explosion of scientific knowledge and technological advancement, however, new societal challenges requiring ethical reasoning and decision making have taken center-stage. Some timely examples are cloning, organ donation and transplantation, gene therapy, artificial reproductive techniques, use of fetal tissues, stem cell research & therapy, to name a few.

The role of ethics becomes increasingly pertinent today as one interacts with patients and research participants from different socio-cultural and religious backgrounds, be it for routine healthcare delivery or biomedical research. Even when clear ethical standards and principles exist, there will

be times when the need to do accurate research runs up against the rights of potential participants. No set of standards can possibly anticipate every ethical circumstance. Now these circumstances could range from issue associated with different ethnic groups in a society, socio-cultural practices, religious inclinations, level of literacy to mere exploitation. To address such needs most institutions and organizations have formulated Institutional Ethics Committees (IECs), a panel of professionals who review research proposals with respect to ethical implications and decide whether the proposal merits sanction or whether additional actions need to be taken to assure the safety and rights of research subjects or participants.

I shall build up my story with a brief historical overview and elaborate on the basic principles of Bioethics before moving on to various aspects that have to be considered when it comes to biomedical research involving human participants. I shall also touch upon '*Risk-Benefit analysis*' as many researchers and members of Ethics Committees struggle with it, '*Conflict of Interest*' as it can pose serious problems that usually arise from lack of awareness about it, and '*Priority Setting*' as globally, health care delivery systems face problems of distributive justice and efficiency related to setting priorities for allocating limited resources for a defined population.

S7/02

Bioethics and Professionalism in the MBBS Curriculum

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The medical profession is considered the noblest profession. The doctor is bound by ethical code of conduct since time immemorial. The Oath of Hippocrates administered to every medical graduate binds him/her with a ethical code of conduct towards his patient and fellow brethren. However, the MBBS curriculum does not incorporate ethics as a formal subject till date. The budding doctor needs to be well aware of what constitutes his ethical duty towards his patients, fellow doctors and society. My presentation will highlight the role of physiologists as medical teacher in imparting knowledge about ethics to students starting with their entry into medical college. I will also discuss as to what should be incorporated while teaching the students about professionalism and ethics.

Ethics of Publication and Authorship

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Publication, whether to disseminate the research work or compulsion of a job is the need of the hour. The need to publish has led to a race for both quantity and quality. With the growing number of journals including the free access and paid publications the authors are left in dark as to what to publish, how to publish and whom to include as co-author. There is lack of clarity as to what constitutes as an ethical publication. A common dilemma is whom to include as co-author. Does publication of an article too have ethics? This talk will focus on the guidelines and principles for what constitutes ethics in publication and authorship.

S.8: Autonomic Functions in Health & Diseases

S8/01

Role of Autonomic Functions in Health

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The autonomic nervous system (ANS) provides logistic support to various organ-systems and integrated responses of the body. ANS adjusts the blood flow at rest and during high demand activities. It also takes care of the functioning of individual organs in the backdrop of failing systems with a pre-determined typing. The integrity and optimal functioning of ANS is crucially important during hemodynamic crises and during high demand situations. Certainly there should be some system and orderliness involved to meet the requirement and sustain life in adverse physiological environment. The sustainability of human life during extreme environmental conditions puts additional and serious burden on ANS. ANS is a resource rich system. These resources are conserved, expanded slowly or may be expanded quickly to make tissue survive. The working of organ-system imposes the demand. A decision to meet requirement is taken by ANS appropriately.

The first principle used by ANS for regulation is re-appropriation or re-distribution of resources. The performance of the system can be optimized by balancing between negative feedback control systems and feed-forward control systems. The second principle is "distributed controls". It is sympathetic division of ANS

(SNS) which is governed by distributed control system. It means that the control not only lies with central command (as feed forward mechanism) but there are local controls arranged in hierarchy. Therefore, re-distribution of resources (vasodilatation) is heavily dependent on of central command and local controls. Whether it is the balance between the two or overdrive of central command which is important, is a question for research. The path adopted by SNS to resolve the crisis (i.e. preferential blood supply to one region) is the function of inbuilt hierarchy and strength of local command. The interplay is crucial for the survival of organ or of the system. Thus, in these situations the severity of local insult, the priority of the local survival and strength of central command will determine the life sustenance.

The factors that determine the strength and endurance characteristics of central command remain poorly understood. Autonomic-psychologic synergism for central command appears an important factor to strengthen the local command. Autonomic conditioning is the obvious factors that will determine the robustness of the response. The physical exercise, yogic interventions, breathing maneuvers etc are capable of conditioning the ANS. The ANS also controls individual's inherent variability in organ function and its adaptability. Thus ANS helps in achieving stability of body function, even when organs are functioning at fringes. Hence, ANS contributes to allostasis.

S8/02

Autonomic Functions in Neurological Disorders

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The autonomic nervous system (ANS) is enormously disseminate with its pathways permeating all organs and autonomic structures involved in the course of most of the neurological disorders. The pathophysiological processes involving the neurological disorders can be the cause of autonomic syndromes. The ANS involvement in different degenerative diseases has been regularly discussed. It is well known that severe autonomic failure appears early in the course of multiple system atrophy, whereas clinical dysautonomia is moderate in Parkinson's disease (PD) and mild in motor neuron disease. Clinically significant manifestations of dysautonomia are rarely seen in Alzheimer's disease but studies have documented sympathetic over activity.

There is also increasing appreciation of improvement of autonomic dysfunction after the interventions or treatments of these conditions that are documented. Modulation of

autonomic functions has been evidenced in many of our laboratory work on neurological diseases like epilepsy, stroke, Parkinson's disease (PD) and neuro muscular disorders like Duchene Muscular Dystrophy. ANS has been assessed non-invasively by performing conventional cardiac autonomic function tests and Heart Rate Variability. Post ganglionic sympathetic functions, sudomotor and adrenergic autonomic functions can be evaluated by QSART test. These investigations are also sensitivity enough to detect sub clinical dys-autonomia.

Activation of autonomic nervous system is common with seizures. No biological markers of impending seizures have been found; hence evaluation of autonomic nervous system might help. A number of studies have examined the role played by autonomic dysfunction as its relation to epileptogenic discharge and as an explanation for the cause of sudden death in these patients. We have found autonomic cardiovascular regulation were altered in drug naïve, Hot Water Epilepsy & refractory epilepsy patients and yoga as an adjuvant therapy in refractory patients shown an improvement in the seizure attacks with modulation of autonomic dysfunction.

During Inter-ictal period- patients with migraine had an altered sympathovagal balance with predominant sympathetic activity along with reduced vagal tone, which was improved along with clinical symptoms after yoga intervention. Four weeks of Partial weight supported treadmill gait training significantly improved BRS in patients with PD. There was also a positive modulation of cardiac autonomic activity after adjuvant Ayurveda treatment in ischemic stroke.

S8/03

Autonomic Functions in Elderly

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The autonomic nervous system is essential for fast adaptation or modulation of visceral functions during changes in external and internal environments. It provides support to various organ-systems and integrated responses of the body. The aging process is associated with alterations in the cardiovascular and autonomic nervous systems. In geriatric population, autonomic functions are relatively well maintained at rest, but their ability to adapt to environmental or visceral changes are often seriously impaired. These impairments can put them at considerable risk of injury and to challenges for unassisted living. The higher incidence of cardiovascular disease, such as heart disease and cerebrovascular disease in geriatric population is often due to autonomic changes related to aging.

On one hand the autonomic derangement is more common in elderly persons and on the other hand autonomic

function testing is difficult in them due to their co-morbidities and frail health. In the Autonomic function lab at All India Institute of Medical Sciences, we assess the autonomic function in elderly in routine. More than fifty percent of them could not perform the full battery of the reactivity tests. We must consider their physical condition while performing the assessment and interpretation of their results.

We must be vigilant to the clinical signs and symptom in old people related to the autonomic derangements and autonomic function testing in elderly is important for providing them a better living.

S8/04

Autonomic Functions in Hypertensive Conditions

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Autonomic nervous system plays a crucial role in modulating cardiovascular functions and in controlling blood pressure, both at rest and in response to environmental stimuli. There is evidence that the derangement of autonomic cardiovascular control especially an abnormal activation of the sympathetic division is related to the origin, progression, and outcome of hypertension. This sympathetic reactivity is seen not only in established hypertension but even in normotensive individuals with a family history of hypertension and in those with White coat hypertension. This is the reason that the pressor responses to a variety of stressors have been found to predict the subsequent development of hypertension. Interestingly, this sympathetic hyperactivity is likely to be accompanied by an impaired vagal influence on the heart. Thus, not just one but both divisions of the autonomic nervous system may be altered in individuals who are at a greater risk of developing hypertension, even when an overt blood pressure abnormality is not yet detectable. Further support to causative role of autonomic derangement in hypertension is provided by previous studies which have demonstrated that the hypertensive individuals both young and old also have an increased sympathetic and a reduced cardiac vagal drive. An increased sympathetic nerve traffic has been documented in different forms of hypertension such as in pregnancy induced hypertension and in NO deficient hypertension. Thus all of these studies provide credence to the point that alterations of autonomic functions play a key causative role in different hypertensive conditions.

S8/05

An insight to Orthostatic Hypotension

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The attainment of upright posture from reclining or sitting postures exposes the cardiovascular system to the gravitational displacement of blood in the lower segment of the body. This is called as orthostatic stress. Orthostatic hypotension (OH) which is defined as a reduction in systolic blood pressure of 20 mmHg or diastolic blood pressure of 10 mmHg within 3 min of orthostatic stress. In patients with autonomic failure orthostatic hypotension results from an impaired capacity to increase vascular resistance during standing. This defect leads to increased downward pooling of venous blood and a consequent reduction in stroke volume and cardiac output that exaggerates the orthostatic fall in blood pressure. The exact site of excessive venous blood pooling has not been established so far, but it is suggested that the lower abdominal compartment and perhaps leg skin vasculature are the possible sites. Numerous etiology of orthostatic hypotension has been documented which includes medications, non-neurogenic causes such as impaired venous return, hypovolemia, cardiac insufficiency, and neurogenic causes such as multisystem atrophy, Riley-Day Syndrome, pure autonomic failure, diabetic neuropathy etc. Orthostatic hypotension is not always associated with symptoms. Symptoms are seen in patients when the cerebral perfusion is compromised. Deficits of autonomic functions and dysfunctional cerebral autoregulation contribute independently to the pathophysiology of the orthostatic hypotension. Treatment generally, is aimed at the underlying cause and a variety of pharmacologic or non-pharmacologic treatments may relieve symptoms.

S8/06

Autonomic Functions in Diabetes and Metabolic Syndrome

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Autonomic nervous system plays a major role in controlling and regulating major systemic functions in an individual. Autonomic dysfunction and subsequent systemic malfunctions is the chief contributor to morbidity and mortality in diabetes and metabolic syndrome. Among all the systems, the affection of cardiovascular system has a

significant contribution in mortality. An individual with cardiovascular autonomic neuropathy has a high risk of silent myocardial ischemia, cardiac arrhythmias and cerebrovascular diseases. Increasing prevalence of obesity and diabetes makes it imperative to explore the pathophysiology behind autonomic dysfunctions, to standardise the tests detecting it, and to develop the modalities for its prevention and treatment.

Many diagnostic tests (in practice or research) with varying degree of complexities have been used to diagnose autonomic dysfunction. For example, Heart rate variability assessment, cardiovascular autonomic reflex tests (changes in R-R interval with deep breathing, Valsalva manoeuvre, blood pressure response to sustained handgrip and cold, lying-to-standing test), head-up-tilt test, baroreflex sensitivity assessment, muscle sympathetic nerve activity assessment, pharmacological suppression and stimulation tests, and assessment of autonomic-symptom-profile. However, Toronto Consensus Panel on Diabetic Neuropathy has recommended the cardiovascular autonomic reflex testing as the gold standard for the clinical autonomic function assessment.

Various clinical trials and research had shown the strict glycemic control to be very much effective in preventing and retarding the autonomic dysfunction in type I diabetes. But in case of type II diabetes and metabolic syndrome intensive multi-factorial risk intervention is necessary to prevent and retard the autonomic dysfunction. It may be due to the differences in the pathology behind these diseases.

S8/07

Autonomic Dysfunction in Parkinsons Disease and Multiple System Atrophy (MSA)

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Autonomic dysfunction can occur in Parkinsons disease (PD) and multiple system atrophy (MSA) for a variety of pathophysiological reasons and may manifest itself through variations in levels in blood pressure, heart rate and/or regional vascular perfusion or organ dysfunction especially the ones regulated by the autonomic nervous system. The early occurrence of orthostatic hypotension often leads to consideration of MSA, especially in the presence of other features of autonomic failure. Orthostatic hypotension (OH), however, is increasingly recognized in PD, and especially with increasing age, severity of disease and as a result of drug therapy. Prevalence of OH in msa-p is 81% and that in PD is 42-58% frequently presenting as a feature of autonomic dysfunction. Investigation of cardiovascular autonomic dysfunction in Parkinsonism is therefore

important for a variety of reasons, that include determining the diagnosis and in predicting prognosis. The question is whether it's possible to differentiate the two on the basis of autonomic dysfunction? Currently there are two different schools of thoughts, one is in favour and the other is against.

We, at AIIMS, New Delhi found out several caveats in the previous studies and keeping them in mind prepared our study design. We tried to discriminate the two disorders on the basis of the difference in their pathophysiology behind orthostatic hypotension (OH) and hypothesized that the pathophysiology of OH in PD is predominantly cardiac while that of MSA-P is predominantly vascular. As per our results we could establish our hypothesis upto some extent and succeed in finding out a difference between the disorders based on the differences in the pathophysiology of OH and autonomic dysfunction in the two.

In Parkinsonian disorders, understanding the pathophysiological basis of the cardiovascular autonomic dysfunction helps in targeting of therapy, improves management strategies and provides benefit to such patients.

S8/08

Inflammation-induced Neuroplasticity Disrupts Motility in the Inflamed and Post-Inflamed Gastrointestinal Tract

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Effective colonic motility involves an intricate pattern of inhibitory and excitatory neuromuscular signals that arise from the intrinsic and extrinsic neural circuitry of the gut. Inflammatory bowel diseases (IBD) such as ulcerative colitis and Crohn's disease lead to altered gastrointestinal (GI) function as a consequence of the effects of inflammation on the intrinsic and extrinsic neurons that innervate it. Major features of the inflammation induced changes in these neuronal circuitry includes, hyperexcitability of intrinsic and extrinsic neurons at the afferent end of the peristaltic reflex and interneuronal synaptic transmission is facilitated in the enteric circuitry. Furthermore, links have been established between these changes and altered colonic motor activity, and we now know that some of colon motility changes persist even after recovery from inflammation. It is highly likely that inflammation-induced neuroplasticity, which is not detectable by clinical diagnostics, contributes to disrupted gastrointestinal tract motility in active and quiescent inflammatory bowel disease.

S.9: Reproductive Physiology

S9/01

Epigenetic Deregulation of DNA Mismatch Repair and Epithelial-mesenchymal Transition Pathways in Prostate Cancer

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The past few years have witnessed an enormous increase in our understanding of epigenetic regulation of gene expression. In addition to genetic mutations, epigenetic modifications such as histone post-transcriptional modifications, DNA methylation, and non-coding RNAs are highly disrupted in cancer relative to normal tissues. The present study primarily focuses on epigenetic deregulation of genes pertaining to MMR and EMT pathways in prostate cancer with a longterm goal of biomarker identification.

Expression of genes pertaining to MMR and EMT pathways were studied in biopsy specimens collected from prostate cancer and benign prostatic hyperplasia patients using quantitative RT-PCR, immuno-blot and immunohistochemistry. Promoter methylation status of MMR genes was interrogated by methylation-specific-PCR and bisulfite-sequencing. Interaction between microRNAs and MMR genes was verified by 3'UTR-based dual luciferase assays.

Expression of DNA methyl-transferases and several microRNAs were significantly dysregulated in tumor tissues. hsa-miR-155 & hsa-miR-141 and hsa-miR-155 & hsa-miR-21 were demonstrated to bind to their putative seed sequences in hMLH1 and hMSH6 3'UTRs respectively, downregulating the respective genes in tumor specimens. A critical zone in the promoter region of hMLH1 gene was identified to be hypermethylated in prostate cancer patients in a tissue-specific manner. Aberrant expression of several EMT markers and related transcription factors were observed in tumor tissues. HIF-1 α exhibited elevated expression in tumor tissue samples as well as in PC3 cells following hypoxic stress. Certain members of microRNA 200 family that are reported to be under direct transcriptional repression by HIF-1, were found to be downregulated in cancer tissues. miRNAs upregulated in prostate cancer tissues were detected in the patients' serum samples at higher level.

The present study identifies HIF1- α as a master transcriptional regulator whose overexpression in prostate cancer results in an imbalance of DNA methyltransferases and microRNAs modulating important pathways associated with prostate cancer.

Note: A part of this work has been published in PLOS ONE, 2015 May 4;10(5): e0125560. doi: 10.1371/journal.pone.0125560. A part of this would be presented in Global Cancer Summit-2015, November 18-20, 2015, Bangalore.

S9/02

Endometrial Secretions and their Relevance to Uterine Functions

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Endometrium (i.e. inner mucosal layer of the uterus) is a highly dynamic tissue with a unique capability to adhere to the embryo i.e. semiallogeneic entity. However, this ability manifests only during a specific period in the menstrual cycle, termed as the receptive phase or implantation window. The acquisition of endometrial receptivity is an outcome of the spatiotemporal orchestration of endocrine, autocrine, and paracrine events in different endometrial compartments. These events endow the endometrium with a secretory phenotype. Secretions of the endometrium are believed to play significant roles in sperm and embryo transport; protection against pathogens and also in embryo development. Few targeted studies have demonstrated specific molecular deficiencies in the endometrial secretions from women with infertility or other endometrial disorders. Recognizing that uterine secretions may serve as a pool of endometrial receptivity markers, we have undertaken nontargeted investigations to generate human uterine fluid proteomes and identify the proteins that are differentially secreted during the receptive phase. Studies were also conducted to determine whether the differential abundance of select proteins is of any functional consequence. Differential- in- gel electrophoresis (DIGE) demonstrated upregulation in the abundance of alpha-1 antitrypsin precursor (AAT) and haptoglobin in the uterine fluid in the receptive phase, compared to the pre-receptive phase, in healthy regularly cycling fertile women. Isobaric Tag for Relative and Absolute Quantitation (iTRAQ) analysis of the uterine fluid samples from women in the pre-receptive and receptive phases revealed identities of several proteins in the human uterine fluid. High Mobility Group Binding Protein (HMGB1) was one of the proteins that displayed differential abundance in the receptive

phase. It displayed lesser abundance in the receptive phase than in the pre-receptive phase, a pattern similar to that displayed by cellular HMGB1. Further rat endometrium and uterine fluid were also found to have lesser levels of HMGB1 in the receptive phase, than in nonreceptive phase. Interestingly, a significant decline was observed in the endometrial expression of HMGB1 on the day of implantation in pregnant rats. Further, an excess of HMGB1 in the uterine fluid resulted in pregnancy failure in rats. Histological alterations in the endometrium, an increase in the localization of activated NF κ B; and significantly higher expressions of various inflammatory molecules were observed in HMGB1 treated rats, compared to untreated rats. Our initial analysis showed higher expression of endometrial HMGB1 in the women with unexplained infertility, compared with fertile women. These observations reinforce that a stringent control over inflammation is crucial for a successful pregnancy.

Study Funding: Department of Biotechnology, Government of India and Indian Council of Medical Research (ICMR), Government of India

S9/03

A Comparative Transcript Expression Analysis of First Trimester Human Villous Trophoblast Cell Functions by a Custom-Tailored cDNA Array

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The most critical period for development of human placenta is between 4 to 8 weeks of gestation. Any hindrance during this period may prove fatal for normal functioning of placenta and gives rise to various placental disorders. There are reports wherein human first trimester placental villi have been examined using high throughput platform of transcriptomics and proteomics in relation to placental pathology. However there is no such report regarding molecular characterization of fundamental biological events related to placenta growth using timed human first trimester placental trophoblast cells.

MTP samples were collected during 6 (n=6), 7 (n=6) and 8 (n=6) week of gestation; designated as group 1, group 2 and group 3 respectively. Complex ³²P labelled cDNA probes were synthesized from extracted RNA and hybridized onto DNA arrays spotted with human 400 genes on custom tailored nylon membrane arrays. The expression profiles were then analyzed.

Unsupervised and supervised analyses of expression data revealed 386 (95%) were overtly involved in the first trimester placental villi and these could be segregated into three clusters corresponding to 6-, 7- and 8-weeks of gestation. Analysis of relative gene expression in 6-8 week placental villi revealed that a large number of gene products revealed that 70 genes were upregulated and 53 genes downregulated between 6 and 8 weeks villi samples. Four genes (oxytocin receptor, tenascin C, TNF-R1 and retinol binding protein 1) showed differential regulation in human placental villi during 6-8 weeks of gestation.

The present study revealed that proliferative and growth potential of placental villous trophoblast at 6 weeks' gestation is more in comparison to 8 weeks' gestation at the transcriptional level. However, functional differentiation potential appears to be more at the transcriptional level at 8 weeks' gestation.

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S9/04

Evolution of Lactation: Journey from Synapsids to Mammals

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The evolution of mammals and their unique traits are the result of events that happened in an orchestrated progression in the past. The journey began approximately 250-300 Mya in the mid-carboniferous period when early amniotes split into now extinct synapsids and sauropsids. These non-mammalian vertebrates (synapsids and sauropsids) were oviparous and therefore embryonic development in these vertebrates was solely dependent on nutritional reserves stored in egg yolk. Sauropsids, predecessors to the present day reptiles, turtles, crocodiles and birds laid eggs with calcified shells while Synapsids, predecessors to the present day mammals laid parchment-shelled eggs. The need to prevent parchment-shelled eggs from dehydration and pathogens led to the evolution of glandular integument in synapsid lineage. These glandular structures in the integument of synapsids were basically apocrine like glands associated with hair follicles that later evolved into secretory structures meant to provide moisture and protective components like antimicrobial proteins to the permeable eggs. This proto-lacteal secretion was functionally comparable to secretions from other

integument-derived glands, which secreted components like lysozyme and immunoglobulins.

The evolutionary link between lysozyme and alpha-lactalbumin provides evidence for protective functions of the proto-lacteal secretions that predates its nutritional role. Most of the anti-microbials in proto-lacteal secretions are similar to substances present in milk that protects from microbial infections. Thus, the anti-microbial property of the proto-lacteal secretions enhanced the survival of eggs or altricial young and led to selection of mothers with potent or copious secretion capabilities.

The gradual accumulation of milk secretion by cutaneous glands and establishment of complex lactation predates the origin of placentation and viviparity during mammalian evolution. Lactation co-evolved with species-specific adaptations in later mammalian lineages during cretaceous period. The earliest division in the mammalian phylogeny happened 166 to 220 Mya when Prototheria (monotremes) separated from Theria. The latter diverged into Metatheria (marsupials) and Eutheria (placentalia) lineages approximately 140 Mya. At present only two families of monotremes have survived in Australasia, namely Platypus and Echidnas. These species represent ancient oviparous mammals with primitive form of lactation.

The non-mammalian vertebrate embryos during development derive nutrients from vitellogenin proteins present in the egg yolk. These proteins are synthesized in liver and are rich source of lipids, amino acids, phosphorus and calcium to the developing embryo. However, establishment of new resources of nutrients to the developing embryos i.e placentation and lactation in mammalian ancestors led to gradual insignificance of vitellogenin genes (syntenic to the *VIT* genes in chicken) and the progressive loss of their functions through pseudogenisation (approximately 30–70 Mya). Prototherians, which lay parchment-shelled eggs and even lactate have a functional vitellogenin gene coherent with their intermediate reproductive strategy. Caseins, the major milk protein have functional properties similar to vitellogenins and evolved in the common mammalian ancestor approximately 200–310 Mya. The transformation of proto-lacteal secretions into nutritious fluid happened concurrently with the emergence of other features that evolved in modern mammals like high metabolic rate and elevated aerobic capacity leading to fast growth rates.

Thus lactation evolved gradually in synapsids and in combination with placentation it slowly decreased the dependence of developing embryos on egg yolk resources in mammals thereby changing the temporal pattern for maternal investment into reproduction.

S9/05: See on page number-144

S.10: Indo-Austrian Symposium on Autonomic and Vascular function under Microgravity

S10/01

The Space physiology research in simulated environments: India's endeavors in micro gravity research

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Exposure to space like environment provides a remarkable opportunity to investigate the uniqueness of several physiological systems such as cardiovascular, respiratory, skeleto-motor, endocrine, metabolic systems etc. It is important that we bring awareness about this field in public domain. This will stimulate youngsters to join the microgravity research progression and they serve as feeder for future space research programs. Thus, it is in the interest of our country that we initiate studies involving microgravity.

The efforts of Institute of Aviation Medicine (IAM) and AFMC Pune are worth mentioning. During early 1980s several renowned scientists (Dr PK Banerjee, Gp Capt Dr Dixit, Gp Capt Dr NS Baboo, Gp Capt Dr PK Jain, Wg Cdr Dr SS Mishra and Gp Capt Dr Dinesh Dubey) established first time the microgravity facilities at IAM. They are the pioneers in establishing microgravity induced human systemic effects, evaluation and countermeasures using dry floatation/LBNP, rat-tail suspension and its effects on bones and muscles. The effect of LBNP on cardiovascular system and stress hormones was studied in 1993 by Dr Dinesh Dubey. Wg Cdr Rakesh Sharma (Indian Astronaut) was trained and evaluated at IAM (during 1983-84) before proceeding for advanced training at USSR. Till date IAM is the only Institute in South East Asia where human evaluation and micro-gravity simulation is done. As of now the labs at IAM are equipped with state of the art facilities. As these research findings remain classified, there is need to do such research work in open institutes and create knowledge for both civilian, space and defence applications.

Some related work has been initiated at AFMC Pune in recent past (Dr MB Dikshit, Col AK Lavania, Lt Col Dr Latika Mohan and several others). The Department of Physiology devised a simple indigenously developed LBNP consisted of a rexine bag connected to a vacuum pump. They also developed a head up tilt table which could be tilted 2 seconds over 90°. Such fast tilt provides opportunity to study very fast cardiovascular changes independent of baroreflex operation (considering the baroreflex may take 2-3 seconds).

In the Department of physiology at AIIMS New Delhi we have started research in the field of microgravity using lower body negative pressure device. We have initiated studies in two directions: (1) To study the effect of lower body negative pressure (LBNP) on baroreflex response. To induce the baroreflex response we used graded Valsalva response. (2) The second line of thought in the direction of studying the effect of LBNP is on cerebral auto-regulation. The results are very encouraging. We will be presenting some preliminary data in this direction. The LBNP provides very good experimental paradigm to study the dynamic aspect of cerebral auto-regulation.

S10/02

Spaceflight-induced Deconditioning: Relationship to Clinical Medicine & Geriatrics

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Abstract: Spaceflight is known to have both short and long-term effects on the human body. These include cardiovascular and muscle deconditioning, decreases in bone density, spatial disorientation and space motion sickness, immune suppression, sleep duration and quality disturbances, decrements in cognitive functioning, and psychological disequilibrium, amongst others. Upon return of the space traveller to a gravitational environment (or when an immobilized patient returns to 'normal' daily activity) there is a significant re-adaptation period during which performance of a number of the body's physiological systems' is markedly reduced. From a broader perspective, the emergence of post-flight orthostatic intolerance, in general, is actually a phenomenon of the cardio-postural control system and can involve many interacting systems and factors including blood volume level and blood volume control, baroreflex control of heart rate and vasoconstriction, effectiveness of the skeletal muscle pump, cerebral autoregulation, loss of overall muscle mass leading to increased lower limb vascular compliance, which could promote a larger volume of blood sequestration in the lower limbs during upright posture under gravitational stress after the return to earth. The resulting reduction in performance poses a serious challenge, either in the event of a critical post-landing situation requiring rapid escape from a spacecraft, or when a 'deconditioned' person struggles during a recovery phase after a longer lasting bed rest, catabolic state, or similar medical condition.

Spaceflight induced hypovolemia is relevant in clinical practice in syncope, aging, dialysis and chronic debilitating diseases. Indeed, potential parallels between deconditioning due to microgravity and aging have recently been reviewed. Of particular relevance for this talk is the relationship between orthostatic intolerance emerging as a result of aging and that caused by microgravity. By age 70 about half of the population will have experienced syncope at least once in their life, and with age the frequency and severity of syncope events increase. This is a significant problem and today's methods for alleviating syncope are inadequate. It is likely that the mechanism causing reflex syncope in the young and old populations are different with the possibility of a hyperactive autonomic nervous system being the primary mechanism in the young and a combination of a still active autonomic nervous system combined with age-related changes in the cardiovascular/renal systems (decreased vascular tone, reduced dynamic capability of the heart muscles, change in neuro-hormonal volume regulation) being important in the elderly. Although the capacity of the parasympathetic autonomic nervous system is declined with age, the reactions involved in reflex syncope point to the existence of a division of the parasympathetic nervous system that is largely unaffected or perhaps enhanced with age. The neuro-hormonal system also shifts with age: the activity of the sympathetic nerves increases followed by a down-regulation of receptor number and activity, whereas the activity of the renin-angiotensin-aldosterone-system is blunted probably rendering the elderly more dependent upon vasopressin and natriuretic peptides for intra- and extracellular fluid volume control. Understanding the mechanisms of both types of responses might be used to merge information and test hypotheses about how cardiovascular deconditioning due to aging and microgravity could be seen in a unified light, leading potentially to better countermeasures for both subject groups.

Keywords: Orthostatic intolerance; Syncope; Aging; Gender; Sarcopenia; Deconditioning

S10/03

LBNP: Application, Physiological Effects, Variabilities in Methodologies and Limitations

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Lower body negative pressure (LBNP) has been used over the last 4 decades to study orthostatic stress in humans. We present here a summary of several studies published from

1964 upwards. The studies were searched in Web of Science using combined search terms related to LBNP: "cardiovascular system", "orthostasis", "spaceflight" and "methodologies". The reference lists of published articles were used to locate other studies. Studies had to meet the following criteria: (1) LBNP was the primary tool used to simulate orthostasis, (2) studies were done in humans and (3) studies were done in space flight or on Earth. Excluded were articles cited in the review of Wolthius et al. (1974). Literature searches were limited to articles in English. The purpose of this presentation, based on analyses of several hundred LBNP studies, is to (a) highlight the different uses and applications of this noninvasive method (b) identify the variability in the experimental protocols used (c) outline conflicting findings in the literature regarding cardiovascular and neurohormonal responses during and following LBNP d) identify areas of future clarification and research. We present the various procedures and methodologies, address their implications and recommend that these issues must be considered when planning LBNP experiments. While falling short of a call of standardization of the LBNP protocol, as one protocol would not fit into the aims and objectives of specific protocols, we recommend that a greater understanding of the technique would be helpful and allow investigators to design the most appropriate protocol to address their specific question

S10/01

Effect of Microgravity on Gastric Function

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Microgravity environment alters gastric functions of the astronauts including gastric motility and gastric emptying rate. The combined effects of fluid shifts, fluid loss, decreased fluid consumption, and postural changes in microgravity are reported to reduce splanchnic blood flow, decrease gastrointestinal (GI) motility, and thereby decrease absorption and availability of pharmaceutical countermeasures and nutrients. Studies have demonstrated that adequate nutritional status is important for short duration space flight and also critical for maintaining crew health during long duration spaceflight. It has been reported that GI symptoms start in astronauts within minutes to few hours of their orbital insertion. Almost all astronauts experience motion sickness, nausea, vomiting, and other gastric ailments during first few hours to first 2-3 days of a space mission. A significant increase in the

mouth to cecum transit time has been reported in ground based simulations of microgravity conditions like -6° head-down bed rest for 10 days and exposure to dry water immersion. Study was directed by the authors in the laboratory to examine changes in gastric function during exposure to 6 hours of simulated microgravity condition in the form of dry supine immersion (DSI). DSI is a well-known and proven model of creating physiological effect of microgravity on the earth. A non-invasive electrogastrographic (EGG) technique was employed to assess gastric function. Different types of foods like carbohydrate rich, protein rich, mixed and fat rich food was given to the participants after exposure to simulated microgravity condition. The study revealed that gastric electrical response during DSI reduced after intake of different types of food. The fat rich food caused maximum slowing down of gastric electrical response at baseline supine as well as during DSI. Percentage distribution of gastric wave patterns in the EGG recording revealed that about 70–80% of entire EGG recording at resting supine and during DSI consisted primarily of normogastric wave following intake of carbohydrate, protein and mixed foods. However, fat rich foods caused a considerable reduction in a normogastric wave pattern with a concomitant increase in bradygastric and arrhythmic waves. The passive congestion in the venous system due to cephaloid fluid shift during dry supine immersion, a condition akin to real microgravity situation, are responsible for changes in the digestive system. Evidence of slight hepatic and pancreatic enlargement has also been implicated for microgravity induced reduction in gastric motility. Assuming upright posture on the earth is helpful in propelling food across GI tract, which is absent in real space flight and supine immersion. This combined with cephaloid fluid shift may alter gastric functions in the individuals.

Foods which reduce gastric motility would perhaps be more detrimental for the astronaut as this can lead to gastric impairment and may compromise the nutritional requirement of the astronaut. Therefore, the foods prescribed for astronauts have to be gastric friendly and does not exacerbate the microgravity induced changes in gastric function.

S.11: CVS regulation in Health & Disease

S11/01

Integrated Control of Cardiovascular System

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The primary function of cardiovascular system (CVS) is to deliver the supplies needed for tissue metabolism and growth and to remove the products of metabolism. The functioning needs to be precisely regulated for maintaining the mean arterial pressure and hence tissue perfusion. Tissue perfusion depends on the arterial pressure and the local vascular resistance. Furthermore, the arterial pressure in turn depends on cardiac output (CO) and total vascular resistance (TPR). However, CO and peripheral resistance are each influenced by a number of factors and the interplay among these factors determines the level of these variables. Broadly, CVS is under chemical and neural control. Chemical control is via paracrine and endocrine vasodilator and vasoconstrictor mediators, in which kidneys, adrenal cortex, blood vessels etc. play a crucial role. Neural control, on the other hand is integrated in the centres located in brain stem reticular formation. The receptors located in the periphery are the mechanoreceptors responding to changes in blood pressure and blood volume (baroreceptors and volume receptors respectively) and chemoreceptors, responding to changes in blood composition. Afferent nerves are the glossopharyngeal and vagus nerves. Efferent arc is constituted by the autonomic nerves to the effectors i.e. cardiac muscles of heart and smooth muscles of the blood vessels. Sympathetic discharge brings about increases in the heart rate, force of contraction, conductivity and excitability of the heart and vasoconstriction in most of the blood vessels (except sympathetic vasodilator system). Parasympathetic discharge decreases heart rate and causes VD at specific places.

Regulation of the entire CVS depends on the integrated action of multiple CV and non CV controls. Interaction among non-circulatory system viz. autonomic nervous system, respiratory system, endocrine system, hematopoietic organs and liver, temperature control system and circulatory components like CO, MAP, and BV etc. leads to precise regulation of CVS. The CVS undergoes adaptive changes on exposure to some physiologic stressors like orthostatic (standing up), emotional stress and exercise.

S11/02

Regulation of Cardiovascular Functions in Heart Failure

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Cardiovascular sensory receptors, responsible for neural regulation of blood pressure and circulating blood volume are mainly Arterial Baroreceptors and Atrial Type B receptors. Arterial Baroreceptors play major role in the regulation of arterial blood pressure by reflex

chronotropic effect and by changes in vascular smooth muscle activity. The cardiopulmonary (Atrial Type B) low pressure receptors are known to participate primarily in reflex adjustment to changes in blood volume. The activity in these receptors compounds to the stretch caused by the arterial pressure. Fall in the activity of cardiovascular sensory receptors causes haemodynamic changes. Arterial blood pressure was raised and sustained for 10 to 15 sec by controlled partial obstruction of perivascular balloon around descending aorta. A sustained fall in arterial blood pressure was induced by controlled inflation of balloon around inferior vena cava. Ratio of change in heart rate(HR) with change in arterial blood pressure (ABP) to determine baroreflex sensitivity. In normal conditions when all the peripheral sensors and brain the nerves to the heart and blood centers involved in the cardiovascular regulation are operative, the activity in vessels represents the transformation of multiple sensory inputs within the nervous system. Sensory inputs from other than the cardiovascular receptors e.g. pulmonary receptors, chemoreceptors, muscles and skin etc also affect the cardiovascular responses. The other inputs are local and humoral factors. All these inputs along with the nervous system lead to the final responses of the heart and blood vessels to various stresses. The neuro-humoral theory of heart failure suggests that the imbalance in vasoconstrictive and vasodilatory mechanisms play an important role in the pathogenesis of heart failure, particularly in its progression. Vasoconstrictive mechanisms consisting of sympathetic nervous system, renin--angiotensin-aldosterone system, vasopressin, endothelin, cytokines. Vasodilatory mechanisms consisting of natriuretic peptides, prostaglandins and nitric oxide.

These data are the first to examine early changes in central AT1 receptors in CHF. Results suggest that the fall in baroreflex sensitivity and hemodynamic changes occur early in the development of CHF. With the progression of CHF sympatho-excitation and over-expression of AT1 receptors cause further impairment of cardiovascular control. NAD(P)H oxidase-derived ROS may play an important role in the modulation of sympathetic activity in CHF.

S11/03

Myocardial Functions and Autonomic Control in Diabetic Cardiomyopathy

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Diabetes mellitus is a growing public health problem that needs to be tackled at multiple levels.

Cardiovascular complications are the leading cause of diabetes-related morbidity and mortality.

Diabetic heart disease or cardiomyopathy refers to myocardial disease in diabetic subjects that cannot be ascribed to hypertension, coronary artery disease, or any other known cardiac disease.

It affects the myocardium in patients causing a wide range of structural abnormalities eventually leading to left ventricular hypertrophy (LVH), diastolic and systolic dysfunction or a combination of these. Cardiomyopathy is often associated with autonomic neuropathy in diabetic patients. Since the autonomic nervous system modulates beat-to-beat fluctuations in heart rate, methods to quantify heart rate and blood pressure variability have been evaluated as indicators of sympathetic and parasympathetic modulation of the cardiovascular system in experimental models. Baroreflex sensitivity and Heart rate variability are the two frequently used parameters to assess autonomic control of cardiovascular functions. Experimental studies suggest that extensive metabolic perturbations may underlie both functional and structural alterations of the diabetic myocardium. Considerable evidence has implicated oxidative stress, proinflammatory cytokines, hyperlipemia and endothelin-1 in various cardiovascular disease states. There is an urgent need to conduct diagnostic and therapeutic studies specifically in diabetes induced cardiomyopathy for better understanding the initiation and progression of disease and to develop more effective treatments.

S11/04

Assessment of Autonomic Function in Cardiovascular Disease

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The autonomic nervous system plays a central role in the control of heart rate and blood pressure. The vagus and the sympathetic nerves link the central nervous system to the heart. The autonomic nervous system plays an important role not only in physiological situation but also in pathological settings like Myocardial infarction, heart failure, diabetes, and hypertension. That means there is autonomic dysfunction present in the target population requiring cardiac rehabilitation.

Now the question arises why to monitor autonomic nervous system? Neuropathy does not present overnight and there are evidences to show that autonomic nervous system dysfunction precedes neuropathy as in diabetes or

Peripheral autonomic neuropathy or cardiovascular autonomic neuropathy.

If the autonomic dysfunction is detected and corrected early, it will not only protect the ANS but also the related organs and the longevity and quality of life of the patient will be preserved.

Autonomic markers have been shown to have prognostic significance. Autonomic evaluation during exercise and recovery may be important prognostically, because these are high-risk periods for sudden death, and the autonomic changes that occur with exercise could modulate this high risk. These markers provide related, but not redundant information about different aspects of autonomic effects on the sinus node.

S11/05

Cardio-respiratory Responses of Military Load Carriage at Extreme Jungle Terrain

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The ability to carry heavy loads over long distances for prolonged duration is a core functional competency for military personnel, particularly the infantry soldiers. They must not only be capable of performing arduous physical tasks, but must have the physical reserve to remain combat fit on completion of that particular task. The great interest of military researchers is to establish how well soldiers can perform their prime functions during and after load carrying. Jungles in the north-east Indian regions are characterised by wide range of variability in the meteorological conditions, viz., hot, humid, heavy rainfall; and dense population of dangerous and poisonous flora and fauna. Under such a circumstance combating the militant activities at jungle require techniques and tactics to live in jungle successfully. A large no of Indian troops are deployed in these areas to combat insurgencies, naxalism and terrorism. The Indian Army maintains an elite Counter Insurgency and Jungle Warfare School (CIJW) at Vairengte, Mizoram which is used to trained domestic and foreign units in methods for countering irregular warfare (Wikipedia) especially by guerrilla warfare techniques. Carrying of various magnitudes of loads is a regular activity under training conditions as well as real time

operations. Till date no data are available on the physiological workload of such kind of military operations in jungle environment. Physical demand of this kind of operation needs to be quantified for proper assessment of the workload and optimized soldier combat readiness. Therefore, present study was designed to find out the cardiorespiratory responses and workload of load carriage operation by Indian soldiers in jungle environment.

Twenty Indian soldiers [Age- 27.1 (3.3) yrs., height- 172.9 (3.9) cm and weight 67.2 (8.1) kg] participated in the study. Entire experimentation was conducted under supervision of the officials of CIJW, Vairengte, Mizoram at their natural training area of Battle field Training Wing (BTW). The soldiers participating in the study were acclimatized with the hot and humid conditions of jungle and trained to cope up with the situation.

A track of about 1000 m divided into 500 m downhill (top of the down hill considered as starting point), 300 m plain and 200 m uphill (end of the uphill considered as end point) was selected for load carriage study. The uphill and downhill parts were combined with mud and rock. The plain portion was mainly ankle dip water stream and muddy path along with it. Each participants moved from starting point to finishing point of the given track without load and with 10.7 kg, 21.4 kg and 30 kg load. The volunteers wore combat uniform and boot during the load carriage experiments. Measurement of maximal aerobic capacity (VO_{2max}) was carried out before load carriage trial inside a makeshift laboratory. During load carriage experiments heart rate, oxygen consumption (VO_2), minute ventilation, respiratory frequency and energy expenditure of each of the individuals were recorded by portable breath by breath gas analysis system. The Relative work load (RWL, %) was calculated each load carriage condition by using this formula- $[RWL = \text{oxygen consumption } (VO_2) \times 100 / VO_{2max}]$.

Observations of the present study suggested that during downhill walking soldiers could carry upto 10.7 kg load (RWL = 40%) for 8 hours and 21.4 to 30 kg (RWL= >60 %) for 2 hrs only. During level walking soldiers could carry upto 30 kg load for 8 hrs as the RWL varied from 28.8 to 41.0 % with no load to 30 kg load. During uphill walking it is recommended for carry upto 10.7 kg (RWL=63.8%) load only for 30 minutes. Further studies are required to suggest the work duration for higher load like 21.4 kg and 30 kg at uphill walking in jungle environment.

S11/06

Physiological Basis of Coronary Intervention

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Coronary angiography gives information regarding coronary anatomy. It also helps in assessment of microcirculation. When coronary stenotic area is $\geq 70\%$ then only angioplasty or CABG is beneficial.

When the lesion is borderline between 50-70%, interventions are hazardous. There is inter-individual variability in assessment of coronary stenosis.

Physiological study is of prime importance in these borderline lesions, for instance, doing FFR before doing coronary intervention. There is no inter-individual variability in assessment of the lesion by FFR. When the lesion is significant with FFR, then intervention is beneficial.

S.12: Physiology of Vestibulo-Audiometric tests and Neuro-physiology of Vision

S12/01

Role of Cortical evoked potential in evaluating patients of hearing loss and its advantages over ABR

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Cortical evoked potential or cortical evoked response audiometry (CERA) is the bioelectrical or electrophysiological activity recordable in the period of 50 to 500 milliseconds after the onset of the sound stimulus. It is also known as late latency response (LLR).

5 peaks are recognized as P1, N1, P2, N2 and P3. P1, P2, P3 are positive waves and N1, N2 are negative waves. P3 is the most important wave and appears around 300 milliseconds after the sound stimulus.

Method of recording is just like that of ABR. The P300 wave peak of latency response is clinically very important as this wave appears and is robust only when the subject recognizes and attends to the stimulus or the stimulus has some meaning for the subject.

Wave is related to cortical functions like short term memory, processing of the auditory information, the mental concentration and intelligence. These waves thus have role for neuro psychiatrists and neurotologists.

These waves have importance when we are suspecting cognitive and attention disorders and disorders of auditory processing. These findings are not clearly visible in ABR/BERA recordings.

S12/02

VEMP Testing and its Interpretation in Diagnosis of Hearing Loss

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Vestibular evoked myogenic potential(VEMP) is an easy to administer and reasonably accurate, reliable and non invasive electrophysiological test to ascertain the function of saccule and the inferior vestibular nerve which cannot be tested by other vestibular tests. The purpose of the VEMP test is to determine if the saccule, one portion of the otoliths, as well the inferior vestibular nerve and its central connections, are intact and working normally. The saccule, which is the lower of the two otolithic organs, has a slight sound sensitivity and this can be measured. This sensitivity is thought to be a remnant from the saccule's use as an organ of hearing in lower animals. It is not the replacement or alternative to the ENG / VNG / CCG / Posturography test but is a supplement to these tests. Whereas ENG/VNG tests evaluate portion of labyrinth connected to superior vestibular nerve, VEMP evaluate inferior vestibular nerve. It is also possible that hearing is synergistic with vestibular input -- i.e. you get more of a response with multisensory convergence. We are presently of this opinion, but these are issues that need to be worked out.

The best part is that it can be done by non trained personnel and does not require a qualified audiologist or a neurotologist to carry out the test and it takes very little time. In this presentation, we are trying to emphasize uses of VEMP's for diagnosis of hearing loss in the light of recent research and development .

S12/03

Complex Level Alterations of the 2f(1)-f(2) Distortion Product of DPOAE due to Hypoxia in Inner Ear

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Cochlea process the sound energy transmitted by ossicles through oval window into neural signals to be carried by auditory nerve to the auditory cortex for normal hearing.

The low intensity sound emitted by biological activity of Outer hair cells of cochlea which can be picked up, recorded and measured by placing a microphone in the deep external auditory canal is called Otoacoustic emissions(OAE). There are two types of OAE, Spontaneous OAE which are generated normally without any external sound stimulus, on other hand Evoked OAE has to evoked by presenting a sound stimulus. OAE are present in isolated auditory nerve disorders.

Evoked OAE is further subdivided in to Transient evoked OAE (TEOAE) in response to a series of click stimuli are presented to cochlea and Distortional product OAE(DPOEA) is the evoked response of Cochlea when sounds of two frequency are submitted namely f(1) and f(2).

The clinical implication of DPAOE is that if a DPOAE test is done using 2 frequency f_1 and f_2 , then the evoked DPOAE of 2f1-f2 will represent the cochlear function of the f2 frequency region of cochlea. Till now the DPOAE was used for identification of auditory neuropathy or for screening of New born.

Complex level alterations of the 2f1-f2 occurs in response to hypoxia to cochlea by a variety of means like hampering of blood supply to cochlea or decrease oxygen in the environment can be measured quantitatively and at same time its response in reversal of hypoxia can also be measured giving an insight in the mechanism of Sudden sensori-neural hearing loss.

If we have measurable hypoxia specific alterations of 2f1-f2 then we can understand the pathophysiology of acute hearing disorder. Various animal studies and recently human volunteers study has shown that these complex level alterations have a set pattern in response to hypoxia with a characteristic time-course when hypoxia was started and continued and reversed. DPOAE levels exhibited a short increase before they decreased and remarkably destabilized in response to hypoxia. After re-oxygenation DPOAE levels showed a pronounced level decrease, while oxygen already had recovered to pre-hypoxic values. After reaching a minimum, DPOAE levels slowly recovered to

pre-hypoxic values. If DPOAE destabilization is observed in a clinical setting in patients with certain inner ear hearing disorders hypoxia can be suspected as one underlying pathophysiological cause which might influence treatment decisions.

S12/04

Physiology of Vision

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Eyes are considered to be an extension of forebrain. The characteristic arrangement of the nerve fibres from the retina to the occipital cortex lead to varied presentation in neuroophthalmic diseases. The detailed knowledge of the tectonic placement of the fibres helps the clinician to clinch with the correct neurophysiological condition in clinical practice supported by the clinical presentation and investigational modalities available.

S12/05

Role of duration and volume of irrigation in eliciting physiologically valid caloric responses during VNG

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The Caloric test is the most important laboratory investigation to assess the responsiveness of each labyrinth separately. The horizontal canal being the closest to the External auditory canal and being oriented in the plane of temperature gradient is affected the most. The nystagmus elicited is driven by convective and non-convective components. The warm and cold stimulation with fluid or air theoretically has to render similar results. But in reality the results vary drastically across the globe. The results vary from centre to centre and also from one device to another. The variations are due to the differences in delivery technique, anatomical variations, medium of stimulation, test process, result analysis etc. The American national standards (ANSI) water irrigation guidelines follow 30* and 44*C \pm less than 0.5*C. The British society of audiology (BSA) follows similar temperature with variation at tip being less than 0.4*C. The BSA also has guidelines for air irrigation at 24* and 50* C. The flow rate and delivery time has an impact on the temperature of stimulus and thus affects the outcome significantly. The ANSI states a guideline of 200ml \pm 20ml/min for 40 seconds \pm 1 second. The similar guideline by BSA states 250ml \pm 10

ml/minute for 30 seconds and air flow of 8 litres of air ± 0.4 over 60 seconds. The normative data is specific for a particular device and it should be gathered prior to analysing the results.

S.13: Therapeutic Targets

S13/01

Pharmacotherapy of Rheumatoid Arthritis

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Rheumatoid arthritis is a chronic systemic inflammatory disease with insidious onset. It is characterized by morning stiffness, symmetrical polyarthritis, low-grade fever, fatigue and loss of appetite. Initially pain and inflammation involve proximal interphalangeal and metacarpophalangeal joints but later on bigger joints are also affected leading to deformities. But spine (except cervical spine) and sacroiliac joint are spared in Rheumatoid arthritis. Extra-articular manifestations are subcutaneous nodules, vasculitis, Interstitial lung disease, pleural effusion, pericarditis, splenomegaly, anemia and Leucopenia. RA factor and anti CCP antibodies are present in 70 – 80% cases of Rheumatoid arthritis.

Aim of therapy is to relieve pain and inflammation, preserve joint function and prevent deformities.

For symptomatic relief NSAIDs are used with short course of Corticosteroids. Corticosteroids may retard progression of articular erosion.

Disease modifying anti-rheumatic drugs (DMARDs) slow or retard progression of disease and ensure longer period of remission. In the category of synthetic DMARDs Hydroxychloroquine, Sulfasalazine and Minocycline are effective in mild disease, while Leflunomide and Methotrexate provide long term efficacy in moderate to severe disease. Tofacitinib is preferred when Methotrexate is ineffective or not tolerated by the patient. Biological DMARDs like TNF α inhibitors like Etanercept, Infliximab, Adalimumab, Golimumab and Certolizumab are effective in the disease state refractory to Methotrexate, however these expensive drugs increase the risk of infections. In nonresponders to TNF α inhibitors may be benefited by Abatacept, Rituximab or Tocilizumab. Immunoabsorption apheresis, Autologous stem cell transplantation, Dietary eicosapentanoic acid supplementation are considered as new approaches in the management of Rheumatoid arthritis. Comprehensive management of Rheumatoid arthritis besides drugs includes Rest, Physiotherapy, Weight reduction, assistive devices and orthopedic surgery that may be needed in some patients.

S13/02

Newer Drug Targets for Diabetes

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The number of people with diabetes is rapidly rising and expected to 300 million by 2030, of which 90% will have type 2 diabetes. The WHO projects that diabetes will be the 7th leading cause of death in 2030. There is always a need for drugs for diabetes as traditional drugs have their inconveniences in terms long-term efficacy, safety, preventing late complications, and drug-disease interaction. Various new drug targets and compounds have been identified in the recent past effective in diabetes most of which are in the development phase.

Promising molecules include GLP-1 analog (exenatide Long-Acting Release; LAR) and a GLP-1 mimetic, Dipeptidyl-Peptidase 4 (DPP-4) Inhibitors of sodium-coupled Glucose Cotransporter 2 (SGLT-2 inhibitors), Inhibitors of Glycogen Synthase Kinase-3, Carnitine Palmitoyltransferase-1 Inhibitors, Glycogen Phosphorylase Inhibitors, are at various phases of development.

The role of enteroinsular axis in diabetes has been studied. Elevation of serum gastrin by inhibiting the proton pump has shown to enhance insulin release and affect diabetes control.

In addition, several compounds are under development for mitigating various diabetic complications, such as neuropathy, nephropathy, retinopathy etc. Inhibitors of the polyol pathway by drugs with antioxidant property have shown to be effective in certain diabetic population.

It is expected that in the coming decade several new molecules for controlling diabetes and its complication will arrive the market.

S13/03

Innovative targets: cardiovascular diseases

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New targets and drugs are being investigated to tackle the increased morbidity and mortality due to cardiovascular disorders. The recent approval of dual inhibitor, sacubitril-

valsartan, an angiotensin receptor-neprilysin inhibitor, is being considered to be a therapeutic revolution in pharmacotherapy of heart failure. Earlier, these molecules were being discarded due to serious angioedema. However, it led to a new direction in pharmacotherapy of heart failure. As pathophysiology insights are deepening especially in relation to remodelling, the investigational drugs like endothelin receptor antagonists, cytokine inhibitors, natriuretic peptides and antioxidants are being explored. The prospect of modulating adipokines and their receptors is also an attractive target in the treatment of cardiovascular diseases. PCSK9 inhibitors, alirocumab can pull cholesterol out of the blood like sponges and keep vessels clear of the artery-clogging fats. The regulator of G-protein signalling, RGS-2, is involved in cross-talk between the nitric oxide-relaxation pathway and thrombin-contraction pathway. Hence, RGS-2 is a new drug development target for hypertension. The new analogues of drugs acting on renin-angiotensin system are being explored. Recombinant human angiotensin-converting enzyme-2 (ACE2) a new renin-angiotensin system peptidase is also a new target for heart failure therapy. The ACE2/Ang 1-7/Mas axis may represent new possibilities for developing novel therapeutic strategies for the treatment of hypertension and heart failure. Endothelial progenitor cells (EPCs) are circulating precursor cells that have been implicated recently in vascular and cardiac regeneration. This can play a role in the prevention of cardiovascular diseases. Rho-kinase pathway is another new therapeutic target in cardiovascular disorders. Selective Rho-kinase inhibitor, fasudil, has demonstrated benefits in the treatment of several cardiovascular diseases. However, it is not easy to replace the standard pharmacotherapy with well-established drug groups, until and unless there is a new class of drugs which decrease morbidity and mortality and at the same time have better adverse effect profile.

S13/04

Cannabinoid receptor ligands: More potential, less exploited

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Cannabis has a long medical history but due to concerns regarding addiction and abuse, it became more popular as illicit drug and its therapeutic potential remain eclipsed for many decades. In recent history, discovery of endocannabinoid substances, their receptors and their role in various physiological processes and pathological conditions evoked mounting interest of researchers to

develop exogenous substances that can modulate the endocannabinoid system.

Cannabinoid actions are mediated through G protein coupled receptors i.e. CB₁ & CB₂ receptors. In CNS, CB₁ receptors are predominantly present & are responsible for several psychoactive effects of cannabinoids. Peripherally CB₁ receptors are found in adipocytes, liver, pancreas & in skeletal muscle. CB₂ receptor are located in immune cells & in some central and peripheral neurons

Both agonist & antagonist acting on cannabinoid receptors are explored and it is suggested that cannabinoid receptor agonists may have possible role in many conditions like pain associated with cancer and multiple sclerosis, atherosclerosis, tics and behavioral issues in Tourette's syndrome, inhibit the growth of malignant tumors by inhibiting angiogenesis, emesis, drug induced tardive dyskinesia, glaucoma & bronchial asthma

Cannabinoid receptor antagonists also have some therapeutic implications. CB₁ receptor antagonists have therapeutic potential to treat overweight/obesity & obesity-related cardio-metabolic disorders, and substance abuse while CB₂ receptor antagonists could have future as immunomodulatory and anti-inflammatory drugs.

Despite of overwhelming claims regarding the broad therapeutic spectrum of this group of drugs, not many of them are yet approved for clinical use owing to the psychiatric side effects and abuse liability produced by them. To exploit these drugs for their best therapeutic abilities with minimum adversities, some future research strategies could be development of drugs which are: devoid of central actions, having tissue selectivity, targeting up regulated receptors, drugs selectively targeting CB₂ receptors & exploring non CB₁ & non CB₂ receptor targets of therapeutic value.

Key word: Endocannabinoid system, cannabinoid receptors, therapeutic targets & strategies.

S.14: Neuro-Imaging in Physiology

S14/01

Detection and mapping of neurotransmitter release in the live human brain

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The ability of current neuroimaging techniques to detect acute changes in the levels of neurochemicals is extremely

limited. As a result we have poor understanding of the role of neurotransmitters and neuromodulators in regulation of human cognition and behavior. We developed the single scan dynamic molecular imaging technique to detect, map and measure task-induced acute changes in dopamine neurotransmission in the live human brain. The technique allows detection of dopamine released during cognitive, behavioral and emotional task performance. Using this technique we have demonstrated that different clusters of dopaminergic neurons are involved in the processing of different cognitive and behavioral functions in human volunteers. We have also used the technique to examine validity of hypothesis concerning pathophysiology of psychiatric and neuropsychiatric conditions. The technique can potentially be used to detect, map and measure acute release of a variety of neurotransmitters and neuromodulators.

S14/02

Assessment of brainstem atrophy and autonomic functions in spinocerebellar ataxia type 1 and 2

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Brain stem atrophy is a cardinal feature in spinocerebellar ataxia (SCA) types 1 and 2. There is paucity of literature in the study of brain stem segmentation by neuroimaging analysis. Therefore, we tried to segment brain stem into 4 parts: midbrain, superior cerebellar peduncle (SCP), pons and medulla. It is also known that nucleus of tractus solitarius (NTS) is the autonomic relay center present in medulla. In this context, autonomic function tests (parasympathetic and sympathetic reactivity tests) have been evaluated in SCA1 and SCA2 patients.

- "1. To assess brain stem segmentation in SCA1 and SCA2 patients.
2. To determine autonomic functions in SCA1 and SCA2 patients."

MRI was performed by using a 3T scanner (Philips, Achieva) to obtain 3D T1-weighted scans of the whole brain and analysed by Freesurfer (version 6 dev.) software in genetically proven SCA1 (n = 18, age = 35.3 \pm 8.5 yrs), SCA2 (n = 25, age = 33.6 \pm 10.7 yrs) patients with age matched control (n = 8, age = 33 \pm 6.5 yrs). MRI parameters used in T1-weighted scans were: Voxel size = 0.6 \times 0.6 \times 1, FOV = 240 \times 240 \times 180 and flip angle = 8 μ '. Autonomic function tests were performed by using Finapres in the same patients.

The volume of midbrain (p < 0.001), SCP (p < 0.001), pons (p < 0.001), medulla (p < 0.001) and whole brainstem (p < 0.001) were significantly reduced in SCA1 and SCA2 in comparison with control. Also midbrain, pons and whole

brainstem volume have been found significantly lower (p < 0.001) in SCA2 than SCA1. Regarding autonomic function tests, abnormality in parasympathetic reactivity (50% in SCA1 and 52% in SCA2) and sympathetic reactivity (55.55% in SCA1 and 72% in SCA2) have been assessed.

The neuroimaging studies reflect differential loss of brain stem volume in SCA1 and SCA2. Also, there are autonomic dysfunctions in SCA1 and SCA2. Therefore, it is likely that loss of medullary volume pertinent to autonomic involvement.

S14/03

Role of MRI and fMRI in neurological disorders

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Functional MRI (fMRI) is of great importance to know the brain functions. It enables the recognition of brain areas by metabolic activity during a task. It has the ability to quantise signal differences between oxy and deoxyhemoglobin, known as BOLD (blood oxygen level dependent) contrast. Other MRI techniques like DTI (diffusion tensor imaging), VBM (voxel based morphometry) etc give structural information and in combination with BOLD changes, they give a comprehensive morphological, physiological and functional details of cortical and sub-cortical structures of the brain.

Functional MRI (fMRI) studies during right hand index finger movement in controls report blood oxygen level dependent (BOLD) activation in contralateral primary motor cortex (PMC), supplementary motor area (SMA), sensory motor cortex (SMC), ipsilateral PMC, inferior frontal gyrus (IFG), dorsolateral prefrontal cortex (DLFC), bilateral insula, basal ganglia and cerebellum, while for complex finger tapping (FT) include prefrontal cortex the rate of tapping being controlled by SMC.

Computer aided diagnosis based on MRI has drawn the attention of pattern recognition and machine learning communities during the past few decades. Numerous approaches have been proposed to diagnose diseases, such as Alzheimer's disease, schizophrenia, tumor or lesion detection and Huntington's disease. Prof. Agrawal, JNU, New Delhi and our team at AIIMS developed a non-invasive and reliable computer aided diagnosis of PD based on ROIs is proposed by utilizing T1-weighted MRI and a machine learning algorithm. All images are segmented into gray matter (GM), white matter (WM) and cerebrospinal fluid (CSF). For each segmented volume, features from ROIs namely substantia nigra, thalamus, hippocampus,

frontal-lobe and mid-brain are extracted. The decision model is built with a well-known machine algorithm named support vector machine. A real well-age and gender matched balanced dataset of 30 PD and 30 normal subjects is acquired and employed to check the efficacy of the proposed approach. The results demonstrated the importance of substantia nigra region in distinguishing PD from controls. Further, a small set of relevant and discriminating features are selected from each ROIs using unpaired two-tailed two-sample t-test. With the use of feature selection, the performance improved for all TPMs with small set of features. The performance of the proposed method outperforms the voxel-based morphometry method. Further, in PD subjects, loss of GM and WM is observed which is compensated by gain in CSF. Thus, apart from GM and WM, CSF may also be considered as a good biomarker in PD diagnosis. The results of our studies in Parkinson's disease (PD) using motor task and VBM will be presented.

S.15: Basic Science in Medical Education

S15/01

Importance of Basic Sciences in Medical Education

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We all know the role of fundamental and basic sciences knowledge in medical education.

Then why this topic is raised?

There are two reasons.

One, the recent changes made by MCI in duration of I MBBS and staff requirement.

Second, growing misconception that more time given to clinical teaching as the basic sciences is not used in clinical practice.

And irony is that these changes in medical education in India is brought by the growing need to produce competent Physicians of First Contact.

The present system as we know is I MBBS (12 Months), II MBBS (18 Months), III MBBS (12 Months), Final MBBS (12 months) and Internship (12 months).

While the expanding knowledge in basic sciences is to be dealt simultaneously, the decrease in duration and resources make it more difficult.

Meanwhile Medical Council of India published a document on Vision 2015 to address some of the issues, which is yet to be accepted by Govt. of India.

Each one of us and most importantly the clinicians know that the fundamental knowledge of Anatomy, Physiology and Biochemistry makes the undergrad understand the disease process, diagnosis and treatment.

Discussion with students, colleagues in clinical departments, senior faculty of each major departments and most importantly with successful and famous practicing surgeons and physicians I came to know that the reason behind their success is the fundamental knowledge of Basic Sciences which they use to explain the disease process to the patients and that also helps them to treat them in more professional way.

Time has come to think how we can make the basic sciences, more useful and effective in achieving the National goal of making a competent Physicians of First Contact.

S15/02

Integrating Basic Science with Clinical Teaching

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The preclinical curriculum is based on the report of Abraham Flexner (1910), who persuaded the medical establishment that medical student curriculum should start from basic sciences followed by clinical teaching. Flexner's vision was that preclinical teaching of basic sciences will provide a solid foundation over which clinical reasoning skills and ability to make management decisions can develop. But Flexner's advocacy unintentionally divided and compartmentalised medical curriculum into the pre-clinical and clinical phases. In due course global consensus emerged that there should be a thorough reevaluation of the role of basic sciences in medical education. This led to initiation of many reforms in medical education which advocated integration of basic sciences with clinical teaching based on evidence of best practices.

The purpose of the talk is to discuss why we need integration and benefits of integrated learning, educational theories and models of integration, what is needed to achieve integration and what else is needed beyond integration. Learning theories relevant for discussion of integration are: adult learning theory, which says adults are willing to spend time on learning a topic only after they understand the relevance of that topic. Another theory says knowledge is most effective when the organization of that knowledge matches the way in which the knowledge is to be used and a third theory concerns our understanding about transfer of learning. The challenges of all these theories can be overcome by integrating basic sciences to clinical problems. The curriculum models of integration are

horizontal integration, vertical integration and spiral integration. Horizontal integration is integration across disciplines but within a finite period of time. This means combining courses into units or interdisciplinary blocks such as a combined first year course in anatomy, physiology and biochemistry. Vertical integration is integration across time and is regarded as integration of basic sciences with clinical disciplines in a clinical context. An example of which is Z curriculum model by Wijnen-Meijer in which biomedical sciences and clinical cases are presented in parallel or in connection with one another. Spiral integration is a combination of both horizontal and vertical integration. In these students are given opportunities to revisit aspects of learning to make links between concepts and thus improve understanding. As the student progresses to new phases in the spiral, new information and skills are introduced that build on the information and skills from the previous phase.

Whatever the means, the aim of Integration should be conceptual connection of basic sciences with clinical sciences (cognitive integration) and should focus on actual learning rather than on methods and techniques.

S15/03

Reduction in duration of First Professional, good or bad

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“By the end of my first week of medical school the excitement of becoming a doctor was overpowered by the volume and speed of material presented to me. I felt helpless and fearful for the impossibility of managing it all. It took 3 or 4 months before I could finally catch my breath, stand up, and learn how to begin managing the stress of medical school.” These are words of above average performing medical student of 2nd Professional. We all are aware that in compliance with rules and regulations introduced by the MCI in 1997 duration of 1st MBBS has been reduced from 18 months to 12 months. The reduction of duration of 1st MBBS was meant to reduce the details of pre clinical subjects to the minimum so that more time will be available for clinical studies. The teaching of clinical subjects has to be planned incorporating the teaching staff of preclinical and Para clinical subjects. The reduction in the course of I MBBS has reduced the burden of teaching of preclinical subjects (there being only one batch at a time). Horizontal and vertical integration of teaching between traditional subject areas using a problem based learning approach should be encouraged. Having said that are all these things really

happening?? Most of the students taking admission in 1st MBBS undergo a prior “spoon feeding” type of treatment by their parents and teachers. In a medical college they are exposed to a totally new world of teaching/learning process. They develop problems related to difficulty in studying and understanding of the heavy volumes of the pre-clinical subjects, problems related to adjusting and adapting to the new college and hostel life. As a result, learning becomes very unpleasant, leading to frustrations, corroding of the morale and self confidence of the students, with consequent poor performance in the first term examination disturbing even their mental equilibrium. Vision 2015 of MCI also talks of foundation course of two months but that is still to be implemented. Studies based on feedback from students had been conducted which also indicate that duration could be increased from 12 to 14 months. To conclude reduction of duration has both advantage and disadvantage but to really achieve its true purpose we need to integrate disciplines horizontally and vertically and teachers need to adopt new methods of teaching and assessment so that students do not feel overstressed and two months foundation course is very essential.

S15/04

Student-Teacher Proportion in Medical Curriculum

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In the teaching learning cycle, small group teaching scores over the didactic lectures. It is well researched that the didactic lectures to more than 100 students in a lecture theatre is a teacher-centric where the students' receptivity and learning abilities cannot be assessed. With the decrement in the number of teacher requirements by MCI there is an urgent need to analyse it.

To discuss the pros cons of small group teaching versus large group teaching for providing better learning abilities to the students.

The methods were observational and compared with the data of other places.

Educational specialists always emphasize for the small group teaching for better learning strategies in the curriculum. The small group teaching makes the students to open up and ask questions that are bothering them. At the same time it eases the students as well teachers to communicate less formally in a relaxed fashion. In the medical curriculum understanding of the disease, pathophysiology or understanding any of the conceptual mechanisms, students are required to think, analyse and

interact. This could be possible in small group teaching. The question regarding the student: teacher ratio in a small group teaching is very relevant. A group of students greater 15 for each teacher becomes a crowd. In this teacher loses focus on the learners requirements and the group automatically splits to smaller groups, leading to the development of cross talking. Most of the educationists accept that small group teaching should be advocated and advise it especially for the medical teaching. In this connections recent requirement tables of teachers in medical colleges drastically reduced the number of teachers for every 100 students by the Medical Council of India. This will affect the learning abilities of the students and may harm the medical education in long range.

Therefore there is urgent need for the debate on the student- teacher proportion and to advocate practice small group teaching norms in the medical curriculum.

S15/05

UG seminars in Understanding Physiology: an Experience.

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We are looking forward to a new curriculum in medical education in India based on competency of medical graduates in the near future. More of interactive teaching are being incorporated into the traditional ways of educating medical students, with an aim to produce doctors who can serve the society in a better way. Not underestimating the importance of skills to be incorporated during the course of medical training, one of the foremost steps of developing into a good physician calls for a sound foundation of Physiology and its application as it forms the basis of understanding most medical conditions. Here, we share our experiences in using the modality of seminar presentation by undergraduate (UG) students, as a means of enhancing understanding in Physiology, besides their routine exposure to traditional teaching. We also experiment herewith the early exposure of postgraduate (PG) residents, under faculty -guidance to facilitation of these undergraduate students. This was done as we feel that imparting a holistic training to postgraduate trainees in preclinical subjects like Physiology, whose primary future will be that of a medical teacher, mandates the need of training them, basically as a teacher who is not only capable of imparting knowledge but also one who can motivate, mentor and guide undergraduate as well as post graduate students in their future careers. Their perceptions on their role as Facilitators and guides in such activities are highlighted. The challenges we faced in organizing such innovative sessions are also discussed.

S.16: Molecular Medicine pathway and Physiology

S16/01

Hemoglobin Disorders-Molecular Approaches

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Hemoglobinopathies are common genetic disorders of hemoglobin. Identification of these disorders is immensely important epidemiologically and they can be prevented by routine screening program to be carried out in population.

Generally the evaluation of spectrum of hemoglobinopathies in the Multidisciplinary country like India is carried out by hematological, Biochemical methods depending upon the facilities available in the state and expertise as well. However, for detailed investigation and for establishment of antenatal clinics it is necessary to have molecular evaluation setup.

The hematological investigation includes Hb level and red cell indices and biochemical methods include electrophoretic separation and ion-exchange chromatography. Hemoglobin disorders were the first one where the diagnosis at molecular level was performed and antenatal diagnosis was established in seventies.

In the era following accomplishment of the “Human Genome Project” molecular diagnosis has been steadily expanding and so with Hemoglobinopathies. Availability of a wide range of modern molecular diagnostic tools, including genomic, proteomic and cytomic technologies, has made clinicians emphasize evidence-based diagnostics, thus filling the gap from laboratory to practice. Similarly for hemoglioniopathies spectrum a wide range of techniques from PCR to sequencing, MLPA and microarray are being used. However, PCR for known common mutations and sequencing for detecting unknown mutations are currently being used world over and providing antenatal diagnosis under the umbrella of national control program of thalassemia.

S16/02

Role of molecular medicine in physiology

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A great deal has been learned about the molecular defects responsible for the development of many human diseases.

Fortunately, advances in elucidating the molecular pathology of these diseases are beginning to contribute to the development of new approaches to their prevention and treatment. This growing knowledge has been broadly named molecular medicine, which encompasses physical, chemical, biological and medical techniques to describe molecular structures and mechanisms, identify fundamental molecular and genetic errors of disease, and to develop molecular interventions to correct them.

Almost all disorders in human physiology are somehow linked to the genetic makeup of the individual either directly or indirectly. Some disorders are inherited within the family while others are result of spontaneous faults in the genetic material. Understanding the pathophysiology of any disease involves analysis of the contributing macromolecules for example protein which may either be of functional or structural value for normal physiological activity of an individual. Any defect in the coding region of the gene encoding that protein may lead to production of nonfunctional protein thereby leading to deleterious effects. For example mutation in genes encoding important enzymes of metabolic pathways may lead to lifelong ailments like Phenylketonuria, Lesch-Nyhan syndrome, Galactosemia etc. Similarly mutations in the structural protein of hemoglobin may result in disorders like Sickle cell anemia and thalassemia and mutation in CFTR protein causes Cystic fibrosis. Alterations in the noncoding regions of the gene are also implicated in many disorders mainly triplet repeat disorders for example Fragile X syndrome is the leading cause of mental retardation among population. The present talk will focus on the utility of growing number of sophisticated molecular techniques for identifying defective genes underlying various disorders which poses serious concern on the society. Most of these disorders cannot be cured and may involve lifelong dependability. Prenatal testing and newborn screening is of a great significance in such cases and would help couples to take reproductive decision in present and/or future pregnancies.

S16/03

Molecular Pathways for Senescence

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Since time immemorial, scientists have been puzzled with the process of Ageing. It is now known that when telomeres reach a critical minimal length, their protective structure is disrupted. This triggers a DNA damage response (DDR), which is associated with the appearance of foci that stain positive for γ -H2AX (a phosphorylated form of the histone variant H2AX) and the DDR proteins 53BP1, NBS1, and MDC1. Moreover, the DNA damage

kinases ATM and ATR are activated in senescent cells. After amplification of the DDR signal, these kinases activate CHK1 and CHK2 kinases. Communication between DDR-associated factors and the cell cycle machinery is brought about by phosphorylation and activation of several cell cycle proteins, including CDC25 (a family of phosphatases) and p53.

Senescence can occur due to replicative problem as well as Stress Induced Premature Senescence (SIPS). The initiating event for both replicative senescence and SIPS involves the recognition of DNA damage and the activation of the DNA damage response pathway. The key mediator in this process, ATM, phosphorylates important sensors and effectors of the DDR including H2AX, 53BP1 [31,75-77] and p53 leading to the up-regulation of cyclin-dependant kinase inhibitor p21, which in-turn acts to inhibit the action of CDK2 kinase activity arresting the cell cycle in G1. In addition, p21 also activates pRb through the inhibition of cyclin E/CDK2. The dependence of replicative senescence on telomere shortening is evident from its bypass by the ectopic expression of the catalytic subunit of the telomerase holoenzyme (hTERT), which elongates telomeres, thereby abrogating the effect of the end replication problem.

The SIPS differs from replicative senescence in the formers dependence on the P16INK4 family of tumour suppressor proteins, which are activated upstream to pRb. Accordingly, increased P16INK4A expression is considered as another useful marker of senescence in vitro, and indeed elevated protein levels have been detected in ageing baboon fibroblasts along with markers of telomere damage and SAHF. The hypophosphorylated state of pRb results in inhibition of the transcription factor gene E2F and this acts to bring about G1 cell cycle arrest. For this reason, the p53 and p16/pRB dependent senescent pathways are not completely separable and as well as the common link through p21, pRB has been shown to regulate the activity of MDM2 which acts to control the stability of p53. Thus increased expression of p21 is important for senescence. What directs a cell to senesce or apoptose remains unclear, but cell type, the type of damaging agent and the dose administered may be important; as well as the post-translational modifications that p53 undergoes. Possible mechanisms that may be involved in determining cellular fate include the status of the tumour suppressor phosphate and tensin homolog (PTEN). The pathways for senescence are also important for cancer growth potentials of the ageing cells.

S16/04

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S16/05

Evaluation of Mental Retardation with Emphasis on Fragile X Syndrome

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Fragile X Syndrome (FXS) is a Triplet repeat disorder caused by hyperexpansion of CGG of FMR1 gene at Xq27.3. FMR1 responsible for encoding FMRP protein needed for normal functioning brain development.

The intention of the present study is to establish cost effective, less labour intensive and non radioactive method for detection of fragile X and POF carriers over southern Blot, in clinical set up as of now.

Genomic DNA was extracted from blood. TP- PCR and methylation PCR studies were performed for molecular characterisation by fragment analyser and results were documented. For molecular characterization we have used in-house TP-PCR method developed in collaboration of Dr Chong's team from NUS, Singapore.

Out of 99 clinical suspects, 6 were found as full mutation carrier and a single female was having permutation allele. Extended family screening was done for permutation female subject and in two Full mutation positive samples. During the course of study 3 prenatal diagnoses were also done. Out of which one sample was found for permutation carrier.

Molecular evaluation by TP PCR is indeed very promising in providing early diagnosis of FXS. Present in house generated TP-PCR is found to be economical as compared to kit based diagnosis in developing countries like India. As there is no cure of FXS and thus extended family screening in FXS positive samples is highly recommended to reduce the medical load and family trauma in the society by providing antenatal diagnosis to high risk couples.

S16/06

Urea Cycle Defect –a classical molecular model & its physiologic implication.

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Urea cycle defects provide the classical example of metabolic defects and their physiologic consequences, and cycle as a whole serves as a molecular representation for

the study of metabolic defects. The comparatively rare, but well characterised and medically devastating metabolic disorders associated with enzymes of urea biosynthesis illustrate the following general principles of inherited metabolic diseases. Similar or identical clinical signs and symptoms can characterize various genetic mutations in a gene that encodes a given enzyme or in enzymes that catalyse successive reactions in a metabolic pathway. Rational therapy is based on an understanding of the relevant biochemical enzyme-catalysed reactions in normal and impaired individuals. The identification of intermediates and of ancillary products that accumulate prior to the metabolic block provides the basis for metabolic block & provides the basis for metabolic screening tests that can implicate the reaction that is impaired. Definitive diagnosis however requires quantitative assay of the activity of the enzyme suspected to be defective. The DNA sequence of a gene that encodes a given mutant enzyme is compared to that of a wild type gene to identify the specific mutation (s) that causes the disease. The exponential increase in the DNA sequencing of human genes has identified dozens of mutations of an affected gene that are benign or are associated with symptoms of varying severity of a given metabolic disorder.

S.17: Neuro-cognition functions

S17/01

Correlating Impulsive Behavior during Adulthood to Adverse Childhood Experience

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Any adverse experience during childhood is known to produce anxiety in adulthood whenever they are subjected to highly challenging environment. In the present lecture, I am going to discuss on how childhood stress can be manifested as mood/anxiety disorders in adulthood. This report is based on an animal study in which they are subjected to maternal separation and isolation stress during critical developmental periods. These animals when exposed to highly emotionally challenging tasks, exhibit generalized response. On the contrary, they show an increased spatial learning and memory and also significant increase in remote memory. This shows that adverse experience increase the spatial resolution with an impulsive behavior.

Physiology of Cognition

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Cognition is a multidimensional entity and is concerned with full range of psychological processes ranging from sensation to execution. It can be defined in terms of various domains which can be tested separately which includes perception, attention, learning, memory, abstract thinking and expressive function.

Further there exists a relationship between physical brain and mental processes. Thus, assessment of cognition can shed a light towards underpinnings of neural network which can indeed help us understand various physiological (developmental/behavioral) and pathological conditions (diagnosis and prognosis of a disease).

Assessment of cognition has always been a topic of debate. Amongst the tests available, problem lies not only in choosing a particular test but also its validation due to demographic biases and low accuracy for mild conditions.

Thus, it is very important to know and understand the condition for which the test is intended. Whether it is a behavioral assessment taking into account scores and reaction time or it is to be clubbed with electrophysiological techniques like EEG or with imaging modalities like fMRI.

So designing cognitive function tests are entirely “need based”. It is essential to know whether a single test would suffice or battery of tests are to be used and to ascertain demographic profile of the target population in terms of age, education etc.

This talk would focus on various cognitive function tests, its procedure, domain tested and areas of brain activated through it. It would include: Sternberg test, Flankers test, N back test, Stroop interference test, Picture and word memory test, Visuospatial working memory and Binocular rivalry; with the idea that it incorporates most of the domains.

It is worth reemphasizing, that it is futile to develop screens that can fit all. At the same time, with psychotherapeutic interventions these tests can be used for neuro-feedback and cognitive re-structuring. Thus, the potential benefit can be harvested only through thoughtful application of existing tests so as to understand the intertwining between the extent of impairment and the area thus involved.

Advances in EEG Analysis: A Window to assess Cognition

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EEG is an important tool for studying the temporal dynamics of the human brain's large-scale neuronal circuits. Brain oscillations are the basic phenomenon of cortical information processing. The dynamics of EEG activity at rest or during activation hold information about the functional state of subjects and can be used to dissociate different brain networks spontaneously engaged and disengaged during varied states like rest, cognition and varied domains of cognition.

A fundamental, yet unresolved, problem of modern neuroscience is how the coordination of brain oscillations is achieved to produce or modulate cognition. Electrophysiological correlates of brain functions concentrate on the analysis of power distributions in various frequency bands of resting-state electroencephalographic (EEG) activity compared to that evoked during a cognitive task. The role of EEG oscillations in various frequency bands and their synchronization are highly dynamic phenomena and their dependence on perceptual processes such as feature binding, cognitive integration of central states, stimulus or attention needs to be studied in normal brain functions and neurodegenerative disorders and psychiatric disorders. QEEG data provide an opportunity to translate what is known from basic neuroscience to gain new insights into the pathophysiological processes underlying cognitive deficits and clinical symptoms in neurodegenerative and neuropsychiatric disorders such as Alzheimer's disease, Parkinson' disease, schizophrenia, attention deficit hyperactivity syndrome and autism.

The use of EEG in the last decade has not been limited to analysis of band powers. The latest advances in high density EEG technology allows the estimation of sources of EEG activity superimposed on brain MRI map allowing estimation of as many as 6239 dipole localizations in the three dimensional brain structures (in 66 gyri). Source localization is estimated from the calculation of inverse solutions in which the location, amplitude and orientation of a source are adjusted to obtain a best fit between the measured EEG scalp potential and the calculated potential produced by the source. Since the millisecond range of changes in neuronal activity needs to be captured to be able to understand the ongoing changes in activities of neuronal network, these changes in brain activity could be done by analysis of the EEG sources in the brain. Further the predominance of one or more EEG frequency bands along with determination of its source during the presentation of a stimulus may be the determinant of the resultant behavior.

Further, momentary state of the brain, also called as functional microstates, determines the potential processing of the incoming internal or external stimuli. Functional microstate of the brain is the spatial summation of all concurrently active intracranial electrical sources irrespective of their frequency that are measured at the surface of the scalp. Topography of the scalp potential field remains stable for short periods of time (approximately 100 ms), reflecting the momentary state of the mind. The functional microstates in brain have shown to affect both perception and cognition.

The use of EEG for studying network activation and coherence between networks holds promises to understand cognition. Thus with high spatial resolution and a better (1ms range)

S17/04

Neural Representation of Cognition through fMRI

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Brain-mapping using functional magnetic resonance imaging (fMRI) is a well-established and reliable technique, which continues to contribute important knowledge within several areas such as functional neuroanatomy, physiology, basic neuropsychology, neuropsychiatry and clinical neurology. The technique depends on the assumptions that the BOLD response faithfully reflects neural activation across different brain regions and baseline states, and is relatively uniform between subjects. Understanding the relationship between fMRI and neuronal responses is very crucial as the fMRI signal may reflect not only the neuronal firing rates, but in addition the subthreshold activity, simultaneous excitation and inhibition, modulatory. In addition, the fMRI signal may also reflect changes in neuronal synchrony without a concomitant increase in mean firing rate (P Fries, J. H.Reynolds et al. 2001). Another drawback is that fMRI signals reflect the pooled activity of a very large number of neurons; modulations in the fMRI responses could be caused by either large changes in the firing rates in a small subpopulation of neurons, or vice versa.

Various cognitive tasks can be used to map different components, eg. memory, language, speech, etc., either independently or combined. The BOLD representation may give task related activity and also can be used to extract functional connectivity. Resting state connectivity has also gained momentum due to difficulties by the patients responding to task related activities, and hence can be carried out in patients and controls with ease. In the

presentation, the applications of fMRI in epilepsy and Parkinsonism for language and memory evaluations and also motor evaluations in PD will be presented.

Reference:

Fries P, Reynolds JH, Rorie AE, Desimone R. Modulation of oscillatory neuronal synchronization by selective visual attention. *Science*. 2001;291:1560-3.

S17/05

Cognitive Remediation

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Cognitive deficits are a major determinant of outcome in people with insults to the neuronal circuits and have been extensively inspected in illnesses such as severe chronic mental illnesses and traumatic brain injury. Numerous studies have demonstrated an association between the severity of cognitive impairment and functional, social, and occupational outcomes in such illnesses. Research into measures to improve cognition is therefore driven by the hope that such improvements might lead to better overall outcome. So far none of the drugs available have shown substantial benefit in clinical trials for improving such deficits. This lack of progress in psychopharmacology has highlighted the need for effective non-pharmacological methods of cognitive remediation. Cognitive remediation is a behavioral– training based intervention that aims to improve cognitive processes (attention, memory, executive function, social cognition, or metacognition) with the goal of durability and generalization. Remediation programs adopt various training techniques such as errorless learning, self-monitoring, scaffolding and chunking and presents them in a tailored way to the individual to improve the automatization of the information processing necessary for any given task. Empirical support for cognitive remediation is documented by a wealth of published randomized controlled trials. Clinically, the future of cognitive remediation most likely lies in developing effective programs that combine cognitive remediation with psychosocial and vocational rehabilitation.

S.18: Bioinformatics for Physiologists and Pharmacologists

S18/01

Emerging trends in Bioinformatics: A Perspective Towards Medical Science

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Abstract : Bioinformatics constitute a hybridization of biology with computer science where various subject domains like statistics, software, hardware, mathematics are applied in genome, proteome and transcriptome analysis, leading to the development of a computational model, which finally can be applied for the prediction and identification of drug targets, biomarker and novel drug discovery in diagnostics and therapeutics of the diseases.

With the gradual understanding of biological conditions and disease states, there is a drastic shift from reductionist to system level/ integrative approach to understand the underneath mechanism of action of a disease, where the large number of algorithms, mathematical model and statistical techniques such as optimization method, graph based methods (network) along with shortest path algorithm (*Dijkstra's algorithm*) and Machine learning methods (Support vector machine, Artificial neural network Genetic Algorithm, Random Forest etc) are applied.

The combined efforts are helpful to develop the prediction models for studying the interactions of these proteins/enzymes in pathways which could provide an insight about the behavior in metabolic pathways , and further correlate drug target-ligands interactions, ADMET properties and toxicological effects of a drug molecule into the human system. Henceforth, significantly guide for safer drug discovery

The network biology is the most upcoming methodology and computational framework leading to develop a metabolic, regulatory, genetic network as well as protein-protein network of the specific diseases/conditions to identify the potentially significant drug targets through hub/cluster analysis.

These drug targets are further modeled for their structure prediction and could be used in computer aided drug designing to search out for the novel drugs. Finally these hits are pipelined under wet-lab based experiments for validation. Many of these computational methods have limitations in term of false positive prediction or sensitivity or accuracy or computational complexity (depending on type/size of dataset), in several tools/servers. Most recently

with the advent of next generation sequencing large number of data is available for analysis and to correlate their clinical implications under the Big Data analysis strategies.

Still advance computational /soft computing algorithms, pattern matching methods, optimization algorithms have to be discovered to explain and understand and the complex behavior of disease states for better drugs discovery.

S18/02

Computational Modeling in Human Physiology

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The advancement in computational modeling has been quite significant in past two decades. Such advancements have played a key role in understanding of various physiological phenomena . One of the key contributions of such computational modeling is to understand the neuromuscular strategies while a person transition from one locomotion state to other e.g. over ground walking to stair ascent. A pattern classification framework was developed and implemented to show that the neuromuscular-mechanical patterns are significantly dominating ($p < 0.05$) towards terrain type (stairs/ramp) than direction type (up/down) during locomotion transition. These findings suggest that a terrain focused classification approach will be useful for inclusion in classification approaches utilized in lower limb amputee samples.

S18/03

Development of Drug / Vaccine Molecule Against Dengue and H1n1 Viruses Using Bio-Informatics: Ongoing Practice and need for Revised Approach

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Dengue Fever (DF) associated with Dengue Hemorrhagic Fever (DHF) and Pandemic Influenza A (H1N1) 2009 viruses are the two alarming viral diseases affecting human health globally including India. In India, till October, 2015, 64058 cases of dengue with 135 deaths have been reported. On other hand 74350 cases of pandemic H1N1 including

4982 deaths have been reported from 2009 till April, 2015 from India. Till 2006 the conventional approach of development of vaccine against viruses were based on Pasteur theory that is to isolate, inactivate and inject viruses. Availability of complete genomes of pathogen in 1995 marked the era of development of vaccine from genomic information. In the absence of sufficient database on genomics of dengue and H1N1 viruses from India and many other countries, the diagnosis, genomic characterization and vaccine molecule are being developed on the data available globally. In the era of efforts to develop peptide based vaccine against hypervariable

viruses, we need to know the circulating genomes of Dengue and H1N1 viruses, study their mutations causing amino acid variations and then identify the genes which are capable of developing vaccine immunogens using appropriate bio-informatics tools. Regional clusters of non heterogenous gene groups need to be developed using bio-informatics on the wet lab genomic information derived from the representative samples of a state and then an effective/specific drug or vaccine molecule has to be developed.



APPI ORATION AND AWARDS

Prof. Baldev Singh Oration

Dr. S K Jha

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A V Tilak Award

Dr. Kiran Prakash

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HH Loesheke award

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Description and validation of a novel method of measuring pharyngeal pressure in new-born

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Background : Measurement of delivered pharyngeal pressure during continuous positive airway pressure (CPAP) therapy is not in routine practice due to lack of a simple and affordable technique of intrapharyngeal pressure measurement. To overcome the lack of the gold standard solid-state catheter-tip pressure measurement technology in our set up, we improvised a novel method of pressure measurement and tested its validity in a simulated pharynx. Methods: A low-cost pressure transducer was improvised by attaching an orogastric tube to its one end. The other end of the orogastric tube was sealed into an artificial pharynx - a 20 ml syringe. The pressure transducer readings were compared with that obtained by a digital manometer attached to the tip of the syringe. Bland-Altman statistic was used to quantify the measurement reliability of the novel method against the digital manometer. Effect of tube length on the measurement agreement was also studied. The developed technique was applied in new-borns. Results & conclusion: Pressures measured by this technique were in good agreement with

that obtained using a digital manometer. This technique has the potential to be used as an alternative to catheter-tip pressure transducers for bedside pharyngeal pressure measurement in new-born babies, especially in under-resourced setups.

Keywords: Pharyngeal pressure - artificial pharynx - validation study

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K P Puthuraya award

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B K Anand Award

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Ageing causes morphological alterations in astrocytes and microglia in human substantia nigra pars compacta

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Age being a risk factor for Parkinson's disease, assessment of age-related changes in the human substantia nigra may elucidate its pathogenesis. Increase in Marinesco bodies, a-

synuclein, free radicals and so forth in the aging nigral neurons are clear indicators of neurodegeneration. Here, we report the glial responses in aging human nigra. The glial numbers were determined on Nissl-stained sections. The expression of glial fibrillary acidic protein, S100 β , 2', 3' - cyclic nucleotide 3' phosphodiesterase, and Iba1 was assessed on cryosections of autopsied midbrains by immunohistochemistry and densitometry. The glial counts showed a biphasic increase, of which, the first prominent phase from fetal age to birth could be physiological gliogenesis whereas the second one after middle age may reflect mild age-related gliosis. Astrocytic morphology was altered, but glial fibrillary acidic protein expression increased only mildly. Presence of type-4 microglia suggests possibility of neuroinflammation. Mild reduction in 2', 3' - cyclic nucleotide 3' phosphodiesterase-labeled area denotes subtle demyelination. Stable age-related S100 β expression indicates absence of calcium overload. Against the expected prominent gliosis, subtle age-related morphological alterations in human nigral glia attribute them a participatory role in aging.

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S Thakkar Award

Dr. Rameshwar Pal
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R C Shukla Oration

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G K Pal Award

Dr. Amit Kant Singh
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Type 2 diabetes mellitus affects male fertility potential

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Objective : Diabetes is a syndrome that affects all the physiological systems of the body, therefore this study was undertaken to compare the seminogram parameters in diabetics and non-diabetics.

Study design : The study was carried out at Male Infertility and Reproductive Physiology unit in the Department of Physiology, MGIMS, Sevagram, Wardha. 25 normozoospermic subjects with type 2 diabetes and 25 normozoospermic non diabetic subjects were recruited in the study. The semen samples were analyzed for sperm concentration, motility and morphology.

Results: In diabetic group the sperm concentration was 24.6 millions/ml with the motility of 52.3% and normal morphology 31.5%, while in non-diabetic group the sperm concentration was 42.7 millions/ml with 63.1% motility and 47.2% normal morphology.

Conclusion: Thus our observations indicate that there is a detrimental effect of type 2 diabetes mellitus on semen parameters.

Key words: type 2 diabetes mellitus, semen parameters, male fertility potential

C L Malhotra award

Ms. Aparna Akela
Research Scholar
Physiology, Institute of Science, BHU

Life time achievement award

Prof. Mohan Kumar (Ex Prof. AIIMS, New Delhi)

Best Branch Award

Bengaluru Branch

R. Srinivasan Prize for the best paper presented by a post graduate student

RS-1

An Approach Towards Premenstrual Asthma Along With Blood Cell Counts-Variation In Pulmonary Function Tests And Some Hematological Parameters In Defferent Phases Of Menstrual Cycle

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Introduction- Menstrual cycle is a physiological process that occurs in women. It is characterized by periodic vaginal bleeding due to shedding of uterine mucosa. This has its own effect on various systems and metabolisms.

Objective : This study was attempted to understand the variations in respiratory parameters as well as hematological parameters in different phases of menstrual cycle.

Methodology: The present study was conducted on 55 healthy female volunteers within the age group of 18 to 24 years having regular menstrual cycle of 28 ± 3 days from the female medical students of M. L. N. Medical College, Allahabad U.P. We analyzed various pulmonary function parameters and hematological parameters on three different phases of menstrual cycle (Menstrual phase-2nd day, Proliferative phase -12th day & Secretory phase-22nd day). Results- In Pulmonary function test the mean FVC, FEV1, PEFr and FEV1/FVC ratio were significantly different and higher ($p < 0.01$ or $p < 0.001$) in both proliferative phase and secretory phase as compared to menstrual phase. Furthermore, the mean FVC, FEV1, PEFr and FEV1/FVC ratio were also found significantly ($p < 0.05$ or $p < 0.001$) different and higher in secretory phase as compared to proliferative phase. The mean TLC & PMN count increased with time i.e. highest in secretory phase followed by proliferative phase and least in menstrual phase. In contrast, mean Hb was highest in proliferative phase followed by secretory phase and menstrual phase. Conversely, mean eosinophils level was highest in menstrual phase followed by secretory phase and least in proliferative phase.

Conclusion : This study was a moderate attempt to determine regular variations in some specific pulmonary function parameters and hematological parameters, during different phases of menstrual cycle in normal healthy females and evaluate various conflicting reports on female subjects as well as to correlate pulmonary function test parameters and hematological parameters. Eosinophil count increases in menstrual and premenstrual phase. In this phase exacerbation of menstrual asthma has also seen.

RS-2

Spinal H-reflex and Nerve Conduction in Infants with Neural Tube Defect

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Background: Non-invasive electrophysiological studies (H-reflex & nerve Conduction) were used as a tool for assessment of motor neuronal excitability and its conduction velocity in Meningomyelocele infants.

Objective: To see the effect of meningomyelocele (MMC) on H-reflex and nerve conduction in lower limb and compare it with normal infants.

Material and Methods: The electrophysiological studies were done with surface electrodes using BSL Advanced System and GRASS Stimulator model S88 in 29 full-term infants within three month of age. Thirteen infants were suffering from MMC of lumbosacral region and the rest sixteen were normal. H-reflex latency (HRL), maximum amplitude of H-reflex (Hmax), maximum motor response (Mmax), and H/M ratio (i.e. reflex excitability of motor neuron) and motor nerve conduction velocity (MNCV) were recorded at right lower limb (posterior tibial nerve - soleus muscle for H-reflex, and posterior tibial nerve - abductor digiti minimi muscle for MNCV).

Results : H-reflex and MNCV could not be observed in 4 and 7 MMC babies respectively. The mean value of HRL (12.11 ms) was less in the other 9 cases of MMC compared to that obtained in normal babies (13.13 ms). However, this difference was insignificant. On comparing other parameters, the infants suffering with MMC had significantly higher values of Hmax (1.70 mv) and H/M ratio (39.3%) when compared with normal babies (Hmax = 0.99 mv & H/M ratio = 35.9%). Later findings are suggestive of hyperexcitable motor neurons in meningomyelocele, MMC infants having recordable MNCV had comparable value with normal infants.

Conclusion : Lower limb of infants suffering from lumbosacral meningomyelocele had either loss of spinal H-reflex or hyperexcitable neurons, a sign of neural plasticity.

RS-3

Comparison of Montreal Cognitive Assessment Score between Young and Old Taxi Drivers in Mumbai

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Background: With increasing age chance of impairment of cognitive functions increases. Doing stressful activities for prolonged time also affects the cognitive functions. The Montreal Cognitive Assessment (MoCA) is a widely used test for mild cognitive impairment. This test makes assessment of 7 cognitive functions, visuo-spatial, naming, memory, attention, language, abstraction and orientation. Taxi drivers, as they undergo a lot of stress everyday, were chosen as subjects in this study.

Objective : The intent of this pilot study is to determine the performance of young and old taxi drivers on the Montreal

Cognitive Assessment (MoCA) Test and compare them.

Materials and methods : Cognitive assessment was done with the help of MoCA Test on 52 taxi drivers working in the city of Mumbai. They were divided into two groups, Group - A (younger, aged between 25 to 40 years, Mean 31.25) and Group - B (older, aged between 50 to 65 years, Mean 57.19). Printed MoCA Test questionnaires (Hindi & Marathi), downloaded from mocatest.org were used to carry out the test. Only one examiner tested all the subjects. The total possible MoCA score is 30, a score of 26 or above was considered normal.

Results : It was observed that, younger drivers performed better on MoCA test compared to older drivers. The comparison between the two groups was found to be statistically significant (p value <0.001). Unpaired t-test was used for the comparison.

Conclusion : The present study therefore, indicates that cognitive performance is better in young taxi drivers as compared to old taxi drivers.

RS-4

A Study on the Relation of Obesity with Blood Pressure and Hemoglobin Percentage

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Background : Obesity is a multifactorial disease condition commonly measured by body mass index; resulting from genetic, behavioural and environmental causes which significantly affect mortality and morbidity of people in both developed and underdeveloped countries. Obesity is a major risk factor for development of several other diseases like hypertension, coronary artery disease, malignancy of breast, endometrium and colon. So an effort was made to assess the relation of obesity with blood pressure and hemoglobin percentage.

Objective : To find out the relation of Obesity with Blood pressure and Hemoglobin percentage among healthy young adults.

Materials and method : A cross sectional study was done among 53 young adults (aged 18-24yrs) of both sexes. Weight and height measurements were taken and BMI was calculated. Blood pressure was measured in mm Hg with Sphygmomanometer and Hemoglobin percentage was found out by Sahli method.

Results : Mean±SD of BMI was 29.59±2.55. Mean±SD of SBP was 130.68±6.40 and that of DBP was 82.79±3.89. Mean±SD of Hemoglobin percentage was 8±2.20.

There was statistically very highly significant positive correlation between body mass index and systolic blood pressure. SBP increases with increase in BMI. The p-value was found to be .0001 and the pearsons correlation coefficient was found to be 0.82.

There was statistically very highly significant positive correlation between body mass index and diastolic blood pressure. DBP increases with increase in BMI. The p-value was found to be .0001 and the pearsons correlation coefficient was found to be 0.46.

Statistically very highly significant negative correlation was found in between body mass index and Hemoglobin percentage. With increase in BMI Hemoglobin percentage was found to decrease. The p value was .0001 and the pearsons correlation coefficient was found to be -0.93.

Conclusion : The study shows that both Systolic and Diastolic blood pressure increases with increase in body mass index while Hemoglobin percentage decreases with increase in body mass index.

RS-5

Inadequately Managed Hypertension: Does It Really Affect Neurocognition

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Background: Hypertension is a highly prevalent cardiovascular risk factor worldwide. Whereas the treatment of hypertension has been shown to prevent cardiovascular diseases and to enhance life. But still hypertension remains inadequately managed everywhere. Hypertension is characterised by cognitive deficits which also leads to high morbidity.

Objective : To study the neurophysiological and cognitive changes in hypertensives grouped according to WHO guidelines by assessment of

- 1) Responsiveness to visual stimulus
- 2) Responsiveness to auditory stimulus

Materials and methods : The study population of 60 age and sex matched hypertensives from general population of Mumbai, after a detailed history and anthropometric data collection were grouped into four groups according to WHO guidelines Grades. Group A : normal (SBP 90 -119 or DBP 60-79)

Group B : prehypertensives (SBP 120-139 or DBP 80-89)
Group C : grade 1 HT (SBP 140 -159 or DBP 90-99)
Group D : grade 2 HT (SBP 160 or above or DBP 100 or above)
Reaction time were recorded by using software
cognitivedun.in

Results : It was observed that subjects in group A who are optimally managed hypertensives have better reaction time as compared to other groups who are inadequately managed. The comparison was done among the four groups by ANOVA test and found to be highly significant ($p < 0.001$). This was suggestive of better neuromuscular coordination of various physical, chemical and mechanical processes which decodes the visual and auditory stimuli reaching higher centre via afferent pathway as a sensory stimuli in adequately managed hypertensives.

Conclusion : The present study therefore, indicated that if hypertension is managed adequately, it has a potential for strengthening the neurocognition in high risk people and is effective tool to reduce the morbidity.

RS-6

A comparative study of visual and auditory reaction time in resident doctors before and after 24 hours emergency duty

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Background: Reaction Time is a simple mean for determining sensory-motor co-ordination of individual.

Objectives :

- i. To measure and compare Auditory Reaction Time for low tone and high tone sound stimuli before and after 24hours of Emergency Duty.
- ii. To measure and compare Visual Reaction Time for red light and green light stimuli, before and after 24hours of Emergency Duty.

Materials and methods: The study was carried out on volunteer resident doctors from the tertiary referral hospital in Mumbai. Subjects who have given informed written consent only were included.

Equipment: Research Reaction Time apparatus.

Results: The study included 35 males & 29 females with average age being 27 years. The difference in reaction time for green and red light before and after 24 hours of Emergency Duty was found to be significant. The difference between mean Auditory Reaction Time for high

tone sound stimuli and also for low tone sound stimuli before and after 24 hours of Emergency Duty was found to be significant.

Conclusion : Fatigue, sleep deprivation and stress at working place are important factors which increase the Reaction Time and decrease the work efficiency. To avoid this working hours are decreased or the rest pause for few hours is given in between the continuous work or work is performed in shift hours of the day.

RS-7

Heart rate variability in vasovagal syncope during head up tilt test

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Background : Heart rate variability (HRV) has been used to assess the interplay between sympathetic and vagal nervous system on heart rate modulation. HRV analysis in patients of vasovagal syncope has shown variable results.

Objective : To analyze the cardiac autonomic activity by HRV in HUTT Positive and Negative responders and to see whether HRV analysis during tilt could predict an event of VVS.

Material and Methods : 42 patients of syncope (≥ 2 episodes) who underwent drug free passive tilting were analyzed retrospectively. Spectral analysis of HRV was done on 21 positive and 21 negative responders on HUTT during 5min of resting position, 5min immediately after tilt and 5 min just before end of test or occurrence of syncope/presyncope.

Results : Resting values of HRV were comparable in both groups. After the tilt, the positive responders showed a significant rise in LF power and a decrease in HF power till occurrence of syncope. In negative responders, the values of SDNN and total power showed a significant decrease from resting position.

Conclusion : VVS patients showed a greater increase in sympathetic activity during the duration of tilt. The negative responders showed a continuous withdrawal of parasympathetic activity, which was not found in positive responders. These can be explained by the empty ventricle theory. A significant rise in LF and a decrease in HF in VVS compared to negative responders during tilt could provide a prediction of occurrence of syncope.

Critical Role of Endothelial dysfunction in the development of Coronary artery disease in Metabolic Syndrome

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Background : There is conflicting evidence regarding the association of Metabolic Syndrome (MetS) with vascular dysfunction and with occurrence of coronary artery disease in patients with MetS. The present study was designed to investigate the role of endothelial dysfunction and arterial stiffness in patients with MetS for the development of coronary artery disease.

Methods: Patients with metabolic syndrome according to NCEP ATP III criteria were recruited for the study and grouped into those with CAD (CAD+ n=23) and those without CAD (CAD- n=19). Endothelial function was assessed by brachial artery Flow Mediated Dilation (FMD) using B-mode ultrasound. Assessment of arterial stiffness was done by recording carotid-radial Pulse Wave Velocity (cr-PWV), carotid-femoral PWV (cf-PWV) and Augmentation Index (AIx@75) using SphygmoCor.

Results : The peak percentage increase in brachial artery diameter was significantly lower in CAD+ as compared to CAD- ($4.81 \pm 3.58\%$ vs $8.32 \pm 5.08\%$ p value 0.02). Time-dependent change in brachial artery diameter were also significantly lower in CAD+ group as compared to CAD- group in all three minutes post-occlusion. cf-PWV was higher than normal range in both groups (CAD+ and CAD- 10.30 ± 1.76 and 11.62 ± 2.29 m/sec) but not significantly different between the two groups. **Conclusion:** The patients with MetS show raised arterial stiffness and impaired endothelial function. However, in patients with CAD, the endothelial dysfunction is more severe as compared to those without CAD. The severity of endothelial

Harish Gupta Prize for the best paper presented by an undergraduate student

HG-1

The Involvement of ANS in Neck Shoulder Pain & Low Back Pain

AADITYA KATYAL, RAJESH SHARMA, ABHAY ELHENCE

Background: At the central level there is a strong connection between autonomic activation and nociception. A predominance of sympathetic activity, either due to reduced parasympathetic tone or excessive sympathetic activation, reduces the dynamic flexibility of the ANS and results in poor adaptation to altered internal or external demands. Since nociceptive pathways are also affected by autonomic control, the study was planned to evaluate the cardiovascular autonomic responses in patients suffering from low back pain and neck shoulder pain.

Objectives: 1. Involvement of the ANS in the initiation and maintenance of chronic muscle pain in MSDs like Neck-Shoulder Pain & Low Back Pain.
2. To verify the dominant role of Sympathetic branch of ANS in sustenance and intensification of pain.

Methodology: We had incorporated patients to study the Autonomic function imbalance in the Neck Shoulder Pain and Low Back Pain patients.

After eliciting a proper clinical history, a battery of following tests were carried out:

- 1 Lying to Standing test
2. Deep Breathing test
3. Valsalva Maneuver
4. Hand Grip test
5. Cold Pressor test

The results were recorded and statistically analysed.

Conclusion: The general trend of our study indicates that the parasympathetic reactivity was within normal range as compared with the normative data but there was sympathetic overactivity in low back pain patients. We conclude that sympathetic overactivity plays a major role in the patients suffering from low back pain whereas the role of parasympathetic reactivity from the presence study is not clear

HG-2

Comparison of Hindi and English Letter Cancellation Tasks

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Background : Letter Cancellation Tasks (LCTs) are psychomotor tasks that are used for assessment of cognitive functions. Language in which the test is administered can effect the results of the task. Since the LCT used for cognitive testing is in English, it limits the population that can be recruited for cognitive studies.

Objective : The present study compared and analysed the performance on one, two and three letter cancellation tasks in Hindi and English.

Materials & Methods : The study was conducted on 50 healthy volunteers after taking written, informed consent and clearance from Institutional Ethics Committee. Subjects were asked to cancel out target letters in One, Two and Three LCTs in Hindi and English language. Unpaired t-test was used to analyse the total time taken to complete each test and number of errors.

Results : The results revealed a significantly longer time to complete Hindi LCTs than English LCTs. The error rates in the Hindi LCTs were more than that in English with the difference in One Letter Cancellation Task being significant.

Conclusion : The fact that Hindi LCTs had a longer completion time suggests that more information processing is needed for Hindi as compared to English. Hence a separate battery of cognitive tests is needed for Hindi speaking population.

“Impact of Noise Exposure on Hearing Acuity of Marble Factory Workers”

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Background : Noise induced hearing loss (NIHL) is an irreversible but preventable disorder. As population lives longer and industrialization spreads, NIHL adds substantially to the global burden of disability. Even though disease reaches endemic proportions in industrial areas like Kishangarh (District Ajmer, Rajasthan), studies to show its prevalence are relatively scarce which forms the basis of our study.

Objective : To study impact of Noise on Hearing Acuity of Marble Factory Workers and its association with age and length of exposure.

Material and Methods : Our study was performed at J.L.N. Medical College Ajmer, in the months of August and September 2015. Thirty marble factory workers; age group 20-40 years with daily sound exposure of 8hrs/day for at least 5-10 years were selected. After obtaining the clearance from institutional ethical committee and informed consent, the subjects were first examined otoscopically to rule out any external/middle ear disease followed by audiometry by acoustic enclosure manufactured by Interacoustics, Model AC40. The data was analysed using ANOVA and Chi-square test.

Results : The study revealed, 46.7% of 30 workers had hearing loss consistent with noise-induced audiogram (NIHL). Hearing impairment significantly increased with age [$p = 0.019$] and duration of exposure to occupational noise [$p = 0.000$].

Conclusion : Since the prevalence is relatively high (46.7%), annual check-ups and use of personal protective equipments like earmuffs and plugs should be made mandatory in these settings.

Effect of 24 hours of sleep deprivation on color word Stroop task.

TUSHAR MITTAL, ABHINAV DIXIT

Background : Sleep deprivation is known to bring diminution in alertness, judgment ability and cognitive functions which can lead to detrimental effects in professions like armed forces and medical where cognition plays an important role. Stroop task is a psychomotor test used for assessing alertness.

Objective : To study the effects of sleep deprivation on reaction time and interference using Stroop task.

Materials and Methods : 30 healthy male volunteers in the age group of 18-25 years were recruited for the study after explaining the procedure and taking written consent. The study was approved by the Institute Ethics Committee. The study was done using a computer based Stroop task. The reaction time in performing the task was noted along with the error rates. The recordings were done at three times: baseline (between 7-9 am), after 12 hours (7-9 pm) and after 24 hours (7-9 am, next day). The data obtained was analyzed using repeated measures ANOVA.

Results : The reaction times were significantly increased after 24 hours of sleep deprivation when compared to the baseline. A comparison of the reaction times after 12 hours and 24 hours also revealed a significant difference. However there was no significant change in interference (difference in reaction times for neutral and incongruent condition) and facilitation (difference in reaction time for congruent and neutral condition). The number of errors did not show a significant change during the three conditions at three different times.

Conclusion : The present study showed an increase in reaction time after 24 hours of sleep deprivation with no change in executive functions as was evident from non-significant change in interference, facilitation and error rates. It can be concluded that there is a decrease in motor response but the judgment ability and executive functions are not affected by 24 hours of sleep deprivation.



RESEARCH ORAL PRESENTATION ABSTRACT

Oral (O1) Central Nervous System

O/ CNS/1

Resting State Eeg Modulations of Theta Power in Patients with Parkinson's Disease

**ANITA PAL, MADHURI BEHARI, NALIN MEHTA
RATNA SHARMA**

Background : Resting state electroencephalogram (EEG) abnormalities in Parkinson patients suggest alterations in neural oscillatory activity. Various studies have shown changes in the activity of low and high frequency band in patients with Parkinson's disease.

Objective : Resting state electroencephalogram (EEG) was assessed to study the modulation of power in theta band in patients with Parkinson's disease compared to controls

Material and Methods: Resting-state EEG was recorded in sixty nine subjects (by using high density 128 channel EEG net (Electrical Geodesics, Inc. EGI). Mini mental state examination (MMSE) scale was used to classify PD patients as PD without dementia (PDND, n = 30) and PD with dementia (PDD, n=26). Patients with MMSE score \leq 24 were considered as PD demented and with MMSE score $>$ 24 as PD non-demented. Data of these patients were compared with normal healthy individuals of same age and education having MMSE score $>$ 26 (Con, n=13). Clinical dementia rating (CDR) was used to assess the degree of severity of dementia in the groups. Frequency bands were divided on the basis of individual alpha frequency (IAF) calculated for each subject. Absolute mean power was calculated for preprocessed data of eyes closed and eyes open conditions by using Fast Fourier transform (FFT) algorithm in MATLAB. Comparison of power among the groups was done by rank sum test ($p < 0.05$).

Results: Theta power was higher in PDD compared to control and PDND whereas PDND had lower power compared to PDND control.

Conclusion: At baseline, higher theta power in PDD compared to control and PDND is an indicative of poor processing of information in these patients.

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O/ CNS/2

Effect of Thermal Challenges on Body, Hypothalamic and Cortical Temperature in Rats

**LAL CHANDRA VISHWAKRAMA, TRINA
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Background: Simultaneous changes in body (T_b), hypothalamic (T_h), and cortical temperature T_{Co} to thermal challenges need elucidation.

Objective: To study the effect of acute exposure to cold (6°C) and hot (36°C) ambient temperature on T_b , T_h and T_{Co} .

Material and Methods: The study was conducted in six male Wistar rats. T_b was measured by a pre-implanted peritoneal radio transmitter (TA10TAF-40, DSI, USA). T_h and T_{Co} were measured by Fluke thermometers connected to thermocouples implanted near the hypothalamus and the cortex respectively. Temperature was measured at 15sec intervals for 24h. The rats were exposed to cold T_a (6°C) and hot T_a (36°C) for 2h during 10.00 o 12:00h on separate days in an environmental chamber. The sites of thermocouple implantation were confirmed histologically. Repeated measures of Anova was used for statistical analysis.

Results: All controls recordings were done in ambient temperature of $24 \pm 0.2^\circ\text{C}$. The T_b recorded in six rats ranges from $37.3 \pm 0.2^\circ\text{C}$ to $37.9 \pm 0.2^\circ\text{C}$. The T_h ranges from $36.1 \pm 0.4^\circ\text{C}$ to $36.8 \pm 0.4^\circ\text{C}$, where as the T_{Co} ranges from $35.5 \pm 0.6^\circ\text{C}$ to $36.3 \pm 0.6^\circ\text{C}$. During exposure to cold and hot, the T_h & T_{Co} changed abruptly and came back normal after withdrawal from exposure. The T_b was maintained during the exposure.

Conclusion: The T_b , T_h and T_{Co} exhibited diurnal variation. The temperature of the cortex was lowest. Cold exposure reduced T_h whereas. hot exposure increase T_h abruptly. T_b was maintained during the exposure. T_h plays

a significant role in sensing ambient temperature for regulation of T_b .

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O/ CNS/3

Higher Alpha Power Over Left Side of the Scalp During Perceptual Reversals Marks the Predominance of Positive Stimuli Over the Neutral Stimuli in Binocular Rivalry

**NAVDEEP AHUJA, NALIN MEHTA,
RATNA SHARMA**

Background: Binocular rivalry is a phenomenon of alternating percepts when two different stimuli are presented simultaneously to different eyes. The predominance of emotional stimuli over neutral stimuli during binocular rivalry has been reported in literature, but EEG correlates of perceptual reversals of positive and neutral stimuli have not been reported to the best of our knowledge.

Objective of the study: Present study aimed to examine perceptual reversals in rivalry of positive and neutral stimuli.

Materials and methods : International Affective Picture System (IAPS) pictures classified according to their valence ratings were presented according to intermittent paradigm of binocular rivalry and their perceptual rivalry was achieved with the help of a mirror stereoscope. Experiments were done in twenty healthy male subjects aged between 20-35 years. EEG was recorded with 128 channels and wavelet analysis was done with continuous wavelet transform using 'Morlet' wavelet.

Results : Statistical analysis revealed higher dominance durations of positive stimuli compared to that of neutral stimuli. Wavelet analysis showed a significantly higher alpha power over left areas of scalp during perceptual reversals compared to stable perception in time intervals of 100 ms before the stimulus onset as well as during 600 ms after stimulus presentation.

Conclusion : The higher alpha power indicates more relaxed mental state during perception of stimuli with positive affect and has been reported to enhance cognitive task performance

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O/ CNS/4

Neural Correlates of Inter-Individual Difference in Visuospatial Working Memory Capacity

MUTHUKRISHNAN SURIYA PRAKASH, NALIN MEHTA, RATNA SHARMA

Background : Visuospatial Working Memory (VSWM) is an essential cognitive ability pivotal for a range of daily activities and crucial for professionals such as drivers, sailors, aviators and naval officers. Neural mechanisms underlying the inter-individual differences in the capacity of VSWM is still not well understood.

Objective : Inter-individual difference in the performance of VSWM is still unclear. In the current study, we investigated the effect of difference in the performance level in VSWM in healthy human adults.

Materials and methods : We used a VSWM paradigm involving simultaneous encoding, maintenance, active manipulation and retrieval to simulate routine daily activities. Subjects performed the VSWM paradigm which had 3 memory loads and simultaneous 128 channel EEG recording was acquired from 24 participants. GeoSource source analysis software was used to determine the brain substrates responsible for the EEG activity.

Results : Left medial frontal gyrus, left superior frontal gyrus, right superior frontal gyrus, left superior parietal lobule, right inferior parietal lobule and left precuneus showed higher activity in good performers.

Conclusion : In summary, the current study indicates both the frontal cortex and parieto-occipital cortex that are known to play a role in decision making and to form representations of visuo-spatial memory traces respectively, determine the qualitative differences in the cognitive performance between the individuals.

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O/ CNS/5

The Nerve Conduction Study in Patients with Gullain Barre Syndrome and Normal Healthy Controls

**SANJEEV KUMAR SINGH, URMIL GUPTA,
SUDHIR SHARMA, MONIA RATHORE**

Background : The nerve conduction studies (NCS) have a major importance in GBS patients. The present study has been done to do its comparison with the normal healthy controls to quantify its relevance.

Objective : "The nerve conduction study in patients with Gullain Barre Syndrome & normal healthy controls"

Materials and methods : This study was conducted from August 2014 to August 2015 in Department of Physiology on patients referred from Neurology department. 30 patients (M:F =17:13) age > 19 years, presenting within 2

weeks of clinical manifestations of GBS, fulfilling Asbury and Cornblath criteria were included in the study. 30 normal healthy controls were included for comparison. The electrophysiological variables studied were distal latency (DL), compound motor action potential amplitude (CMAP) & motor nerve conduction velocity (NCV) of median, ulnar, peroneal & tibial nerves. Similarly sensory latency (SL), sensory nerve action potential (SNAP) & sensory nerve conduction velocity (SNCV) were taken of median, ulnar & sural nerves. Median & tibial F-waves & tibial H-reflexes were also done. Mean values of electrophysiological variables of controls with 2 standard deviation were taken as the normal range.

Results : Almost all patients complained of motor weakness and majority were areflexic. There were 43% AMAN, 40% AIDP, 6.66% AMSAN type, 10.4% were having both demyelinating and axonal features. Cranial nerves were involved in 13.3% of cases. DL of motor nerves studied was prolonged in 68.83% of cases (p value <.0001) in comparison to controls. CMAP were decreased in 55.17% (P value <.0002) & NCV decreased in 50% of the cases (p-value <.000). SL was increased in 27.78%, SNAP was decreased in 26.6% & SNCV decreased in 31.11% cases. Median F waves were absent in 50 %, prolonged in 16.67% of cases. Similarly tibial F-waves were absent in 56%, prolonged in 6.9% of cases. H reflexes were absent in 80% of cases.

Conclusion : This study shows statistically significant differences in the various electrophysiological variables in the patients of GBS in comparison to controls.

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O/ CNS/6

Effect of NMDA and Ampa Receptors at The Preoptic Area on Brain and Body Temperature in Free Moving

TRINA SENGUPTA , ASHOK KUMAR JARYAL, HRUDA NANDA MALLICK

Background : Glutamate influences brain and body temperature (T_{br} and T_b) when microinjected at the preoptic area (POA) in rats. Glutamate and its various receptors are normally present in the POA.

Objective : The aim of this study was to identify which specific receptor(s) in the thermosensitive neurons of POA are involved in glutamate induced rise in T_{br} and T_b in freely moving rats.

Materials and methods : To identify these glutamatergic receptors at the POA leading to rise in T_{br} and T_b, specific glutamate receptors were pharmacologically blocked by localized pretreatment of their respective antagonists. Specific agonist for different glutamate receptor was then

microinjected into the POA while quantifying its effects on temperature and locomotor activity in freely moving chronically implanted rats.

Results : The results suggest that pretreatment of specific antagonists for α -amino-3-hydroxy-5-methyl-4-isoxazolepropionic (AMPA) receptors were able to block AMPA induced rise in temperature. Pharmacological blockade of N-methyl-D-aspartate (NMDA) was unable to block NMDA microinjection induced rise in temperature.

Conclusion : The findings suggests that glutamate induced rise in temperature in freely moving rats is due to the activation of specific AMPA receptors.

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O2. Cardiovascular System

O/CVS/1

Discrete Wavelet Decomposition and Principal Component Embedding based ECG Steganography

ANUKUL PANDEY, B. S. SAINI, BUTTA SINGH, NEETU SOOD

Background: The integrity of privacy of personal information, past medical record over wired or wireless transmission of the biomedical signal is a critical issue now a days. Encryption and steganography are the commonly used signal processing techniques for privacy, data hiding and data security.

Objective: This brief presents a robust electrocardiogram (ECG) steganography methodology based on discrete wavelet decomposition and secret principal component embedding.

Material and Methods: The experiment with all 48 ECG records from standard MIT-BIH Arrhythmia database validates the proposed steganography process. The novelty of the proposed work is decomposition in 2D ECG formulated by stacking of segmented QRS blocks. Furthermore, the principal component of secret information is embedded in the selected sub-band. This embedding is accomplished by standardization of subband and calculation of appropriate eigenspace where it matches to the principal component of secret information.

Results: Performance evaluation of the proposed ECG steganography method over six performance metric confirms the robustness. Secret data of 200 bytes is embedded in 2 min long ECG duration of all records. The average performance metrics of 48 data records; peak signal to noise ratio, mean square error, structural similarity index, Kullback–Leibler divergence, percentage root mean

square error and bit error rate are equal to 67.09, 1.31, 1, 1.68×10^{-4} , 0.05 and 0 respectively.

Conclusion: The proposed ECG steganography method significantly outperforms other well-known methods present in literature in terms of performance measures.

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O/CVS/2

Modulation of Cardiovascular Response during Graded Activation of metaboreflex

EKTA KHANDELWAL, PALASH RAWLANI, AVINASH INGLE, SUMEET TRIPATHI

Background : Exercise pressor reflex or Metaboreflex plays a significant role in regulating the cardiovascular response to exercise. In humans, metaboreflex evoking sympathetic vasoconstriction is well established but its role in cardio-acceleration is not very clear.

Objective : Aim of this study is to evaluate changes in hemodynamics occurring during metaboreflex activation obtained by post- exercise muscle ischemia (PEMI) after two different exercise intensities.

Material and Methods : Twenty healthy male volunteers after a supine rest for 15 minutes baseline parameters were recorded. Subjects performed two sets of exercise protocols after determination of maximum voluntary contraction (MVC) using handgrip dynamometer from which grade I 30% (moderate) and grade II 45% (High) was calculated. Protocol 1 (free flow recovery) and protocol 2 (isolation of metaboreflex) was performed. Continuous Heart rate & Respiration recorded. Blood pressure was recorded during baseline, at the end of exercise, at the end of PEMI, at recovery 1min, 2min, 3min & 5min. Data was statically analysed by using SPSS.

Results : During metaboreflex, exercise conducted against the grade II caused a more pronounced blood pressure rise than the strain conducted against the grade I ($p=0.002$), Heart rate responses during postexercise muscle metaboreflex were not significantly different from that of control.

Conclusion : During PEMI 45%, blood pressure response was mainly achieved through enhancement of myocardial contractility that increased in cardiac output, whereas during PEMI 30%, blood pressure response was reached predominantly by means of vasoconstriction. The parasympathetic cardiac tone is enhanced during activation of the metaboreflex and balances enhanced cardiac sympathetic activity to result in heart rate an unchanged.

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O/CVS/3

Granger Causality Approach on Cardiovascular System during Postural Change

HELEN MARY M C, DILBAG SINGH¹ AND K K DEEPAK²

Background : Directional interaction among the variables measured from cardiovascular and cardio-respiratory system plays a significant role in the investigations related to their short-term regulation. Commonly used linear approaches including cross-correlation and coherence analysis are insufficient to quantify nonlinear structures. Recently, Granger causality has been found as a preferred method for evaluation of causality, i.e., of directional interaction.

Objective: The nonlinear approach based on Granger causality are proposed to detect interaction between short time-series using information transfer quantification based on conditional entropy during the postural change. This method can compensate the bias in the evaluation of entropy rate occurring at the the long-term signal.

Materials and Method: To analyze the causal interaction of cardiovascular, cardio-respiratory and vascular-respiratory system, simultaneous recording of ECG, arterial blood pressure (ABP) and respiration signal using Biopac[®] MP100 system of 10 healthy subjects (age: 24 ± 3 years) in supine and standing posture were collected. The data was analyzed using Granger causality approach

Results: During supine, unidirectional information flow is detected from respiration to heart rate (HR) and systolic blood pressure (SBP). As regards, a bi-directional interaction is observed between SBP and HR with reduced feedback ($I_{SBP \rightarrow RR}$) of 0.13 ± 0.19 and enhanced feedforward ($I_{RR \rightarrow SBP}$) of 0.52 ± 0.21 . While on standing, information transferred from respiration to HR decreases and respiration to SBP remains unchanged. However, the interaction between SBP and HR increased to 0.47 ± 0.16 in feedback direction and a negligible decrease (0.44 ± 0.15) in feedforward that leads to unbalancing of cardiovascular regulation.

Conclusion: This study indicates that short-term regulation of cardiovascular system is mediated by respiratory sinus arrhythmia during supine posture and baroreflex activity on standing posture. The Granger Causality Analysis is helpful to estimate the meaningful information transfer from respiration to the cardio-vascular system. It can also quantify the meaningful causal relationship between heart rate and blood pressure during standing posture. Therefore, it can help in understanding the regulation of

cardiovascular system during postural changes to identify syncope and provide information about heart stability during this transition.

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O/CVS/4

Hypovolemia during Blood Donation is Associated with Sympatho-Excitation but Attenuated Baroreflex

KAVITA YADAV, AKANKSHA, ASHOK JARYAL, POONAM COSHIC, KABITA CHATTERJEE, KK DEEPAK

Background : Loss of blood volume during blood donation leads to reflex adjustments in the cardiovascular system to maintain blood pressure

Objective : To study the cardiovascular changes before during and after blood donation

Materials and methods : In the present study, Lead II ECG and beat-to-beat blood pressure recording were done for 5 minutes before the start of blood donation, during the course of blood donation (5- 8 minutes) and 5 minutes after the completion of the blood donation to estimate heart rate variability and baroreflex sensitivity in 51 healthy volunteers.

Results : Donation of about 450 ml of blood was associated with significant increase in LF: HF ratio (sympatho-vagal balance) during blood donation and post donation as compared to the baseline values [3.3 (1.62-4.6)] and 3.71 (1.69 - 5.34) vs. 1.69 (1.05 - 2.7) respectively] with increase in LF component (sympathetic) as well decrease in HF component (parasympathetic). Time domain measures of parasympathetic components (viz. SDSD, pNN50) also showed significant decrease during blood donation and post donation as compared to the baseline without any change in SDNN and total power. The baroreflex sensitivity (estimated using spontaneous method) decreased during blood donation and post donation as compared to the baseline [8.6 (6.0 - 12.69) and 9.4 (6.3 - 11.5) vs 12.8 (6.8 - 18.10) ms/mmHg, respectively].

Conclusion : Blood donation is associated with sympathetic activation and parasympathetic withdrawal. The attenuation of baroreflex during hypovolemia induced by blood donation possibly indicates towards important role of low volume receptor in sympatho-excitation and parasympathetic withdrawal.

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O/CVS/5

Quantification of Cardiac Baroreflex Sensitivity at Rest and Autonomic Stimulation

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Background: The cardiac baroreflex system plays a major role in the short-term regulation of the blood pressure. The baroreflex function as an interface between the central nervous and cardiovascular systems and in consideration of its clinical significance, the quantification of Baroreflex function is of high relevance. Its functional properties are strongly influenced by the parasympathetic system. In this study, we quantified Baroreflex sensitivity (BRS) at rest and during slow deep breathing (SDB) and cold pressor test (CPT).

Material and Methods: In 14 healthy volunteers' baroreflex sensitivity (BRS) was quantified by applying sequence analysis based on continuous recording of blood pressure and heart rate. The BRS was quantified during the rest, slow deep breathing (SDB), cold pressor test (CPT) and recovery.

Results: A significant increase in BRS up sequences was observed during the SDB as compared to the rest (18.57 ± 11.84 vs 31.52 ± 11.69 ; $p = 0.01$). Cold pressor test did not show any significant difference in the BRS up sequences compared to the rest (18.57 ± 11.84 vs 18.34 ± 9.89 ; $p > 0.05$). A significant lower BRS up sequence was observed during CPT as compared to the rest (18.34 ± 9.89 vs 31.52 ± 11.69 ; $p = 0.01$). A significantly higher BRS down sequences were observed during SDB as compared to the CPT (13.64 ± 8.03 vs 25.68 ± 8.44 ; $p = 0.04$). A significantly higher BRS all sequence was observed during the SDB as compared to the CPT (17.37 ± 8.57 vs 28.28 ± 7.2 ; $p = 0.02$).

Conclusion: The present study revealed a substantial modulation of the baroreflex sensitivity with respiratory sinus arrhythmia, which constitutes a widely accepted measures of parasympathetic tone.

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Prediction of VO₂ max by Treadmill Jogging Test and Assessment of Physical Fitness

MOHD YUSUF

Background : Aerobic power (VO₂max) is the maximum capacity of an individual to transport and utilize oxygen during incremental exercise, which reflects the physical fitness of the individual. Higher levels of physical fitness appear to delay all-cause mortality.

Objective : The aim of this study was (i) to predict the value of VO₂max by treadmill jogging test and (ii) to assess of physical fitness in apparently healthy students.

Materials and methods : Apparently healthy male subjects (n=125) in the age group of 18 to 25 years were included in this study group. VO₂max was predicted by following the protocol of Treadmill Jogging Test. Physical fitness assessment was also done using criteria defined by The Physical Fitness Specialist Certification Manual, The Cooper Institute for Aerobics Research, Dallas TX, revised 1997 printed in Advance Fitness Assessment & Exercise Prescription, 3rd Edition, Vivian H. Heyward, 1998, p. 48.

Results : The predicted values of VO₂max in Treadmill Jogging test ranged from 40.51 to 51.17 ml/kg/min with mean (\pm SD) 47.20 ± 2.27 ml/kg/min. The VO₂max associated Physical fitness assessment scores of the test showed (excellent in 68% (n=85), good in 28% (n=35) and fair in 4% (n=5) amongst the participants.

Conclusion : Thus we conclude that treadmill jogging test is an effective and safe method to predict the value of VO₂max in individual willing to participate in a fitness programme as well as to follow up the level of fitness in the course of training.

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Sequential changes in arterial stiffness in Gestational Diabetes Mellitus

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Background: Gestational Diabetes Mellitus (GDM) is a frequent complication of pregnancy. GDM is associated with changes in vascular compliance due to pregnancy and

on the other end patho-physiological changes due to diabetes.

Objective: To decipher the dynamic changes in arterial stiffness indices in GDM and how they might differ from normal pregnancy, we serially assessed them in three trimesters of pregnancy.

Material and Methods: Forty women (20 developed GDM and 20 with normal pregnancy, age= 27.6 ± 3.7 vs 26.7 ± 3.6 yrs, $p=0.4$) were periodically followed up to third trimester. All measurements were made at three time points ie. Visit 1 at first trimester (11-13+5 weeks), Visit 2 at second trimester (20-22+5 weeks), and Visit 3 at third trimester (30-32+5weeks). Arterial stiffness indices which include augmentation index (AIx) and pulse wave velocity (PWV) were recorded using applanation tonometry.

Results: Augmentation index (AIx) and pulse wave velocity (PWV) in normal pregnancy and GDM did not show any statistically significant change across the three trimesters. On inter-group comparison, AIx was statistically higher in GDM group than normal pregnancy group in both first and second trimester ($p=0.05$), although this difference was not statistically significant at third trimester. In terms of PWV, the inter-group analysis revealed no statistically significant difference in all three trimesters in GDM and normal pregnancy group.

Conclusion: We conclude that systemic arterial stiffness is higher in GDM as compared to controls even at first trimester of pregnancy and fails to dip in the second trimester. During final trimester, the cardiovascular dynamic changes of pregnancy are able to overcome this difference and the two groups are statistically similar.

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O3. Endocrinology and Reproductive Physiology

Eutopic Endometrium of Sub-Fertile Subjects with Ovarian Endometriosis Displays Markedly Altered Estrogenic Milieu Both In Proliferative and Secretory Phases

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Background: Endometriosis is considered as an estrogen dependent disorder but there exists conflicting reports regarding the expression of steroidogenic proteins involved in estrogen synthesis, metabolism and action. In the present study, we have examined the immunochemical levels of steroidogenic proteins in eutopic endometrium during proliferative and secretory phases of sub-fertile patients

with ovarian endometriosis to bring out differences in the local estrogenic niche.

Method: Eutopic endometrial tissues were collected during proliferative (n=11) and secretory (n=8) phases of menstrual cycle from sub-fertile group of women affected with ovarian endometriosis. Control endometrial tissues were collected from unaffected sub-fertile women during proliferative (n=6) and secretory phases (n=9) of menstrual cycles. Steroidogenic proteins (SF-1, StAR, aromatase, 17 β HSD1, 17 β HSD2, ER- α , ER- β and PGR) were immunohistochemically localized and quantified using Western immunoblotting and immunohistochemistry procedures, respectively. Data were statistically analyzed using ANOVA followed by Tukey test.

Results: The profiles of specific steroidogenic proteins which include aromatase, StAR, 17 β HSD1, ER- β , and PGR showed significant differences in the eutopic endometrial samples in patients with ovarian endometriosis as compared to control endometrial samples. Secretory phase eutopic endometrium was seen to have high 17 β HSD1 and progesterone resistance contributing to high estrogen at tissue level. Aromatase and StAR were found to be significantly lower in eutopic as compared to control endometrium in all phases.

Conclusions: The results of the present study indicated that there was significant shift towards an estrogenic phenotype in the endometrium of subjects having ovarian endometriosis with increased synthesis and action of estrogen at the cellular level in both phases, however, not for increased aromatase as commonly suggested.

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O/ER/2

Prevalence of Thyroid Dysfunction among Pregnant Women Attending Antenatal Clinic of Gynaecology and Obstetrics Dept

APARAJITA MAJI, JYOCHNAMAYI PANDA, JAYANTI MISHRA, MAGNA MANJAREEKA

Background: Undetected and untreated thyroid disorders during early pregnancy in women are associated with adverse maternal and fetal outcomes.

Objective: The purpose of this study is to evaluate the prevalence of thyroid dysfunction especially hypothyroidism during first trimester of pregnancy as such studies have been scarcely documented from Odisha.

Material and Methods: A cross-sectional study was conducted in the antenatal clinic of Department of Obstetrics & Gynecology, KIMS, Bhubaneswar, Odisha over a period of six months. The total sample population comprised of 200 pregnant women with uncomplicated

singleton pregnancies without any history of thyroid disease. Morning blood samples from the participants was analysed for thyroid function test like TSH.

Results: 61.6% of the subjects were found to be hypothyroid (p< 0.0001) on the basis of cut off values of TSH. The cut off values of TSH level for 1st trimester is considered to be 2.5mIU /L and 3mIU/L for the 2nd and 3rd trimesters. Most of the cases were in their 1st trimester (184) and rest were in the 2nd and 3rd trimesters.

Conclusion: Prompt identification of thyroid dysfunction and its timely treatment is essential. Thus universal screening of pregnant women for thyroid dysfunction should be considered especially in a country like India due to high prevalence of thyroid dysfunction

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O/ER/3

Correlation of Glycated Hemoglobin Level with Spirometric Findings of Type 2 Diabetic Males -A Pilot Study

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Background: Diabetes mellitus is a disease complex characterized by chronic hyperglycaemia, along with disturbances of carbohydrate, protein and fat metabolism due to defect in insulin secretion, action or both. Diabetes affects almost all the organs of the body but its pulmonary complications are widely debated. As studies on spirometric findings in diabetics are lacking in this part of the country, its correlation with glycated haemoglobin (HbA_{1c}) level was ventured in our study.

Objective of the study: To find out the correlation of Forced Expiratory Volume in 1 second (FEV₁), Forced Vital Capacity (FVC), FEV₁/FVC ratio, Peak Expiratory Flow Rate (PEFR) and Forced Expiratory Flow between 25% to 75% of FVC (FEF₂₅₋₇₅) of diabetic males with their HbA_{1c} level.

Materials and Methods: A randomized cross sectional hospital based observational study was done on 33 known diabetic males between the age group of 40-60 years. After proper history taking and general examination, HbA_{1c} levels were estimated in all the subjects. Helios 401 spirometer was used for lung function assessment. Statistical analyses were done by Microsoft Excel 2010.

Results: Mean \pm SD of HbA_{1c}, FVC, FEV₁, FEV₁/FVC, FEF₂₅₋₇₅ and PEFR are 8.11 \pm 1.29%, 80.48 \pm 9.8 % predicted, 86.39 \pm 7.61 % predicted, 101 \pm 7.71 % predicted, 84.39 \pm 8.39 % predicted and 87.88 \pm 7.92 % predicted respectively. FVC, FEV₁, FEF₂₅₋₇₅ and PEFR showed

significant negative correlation with HbA_{1c} (p value <0.05).

Conclusion: Spirometric findings in male diabetics are negatively correlated with HbA_{1c}.

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O/ER/4

A Comparative Study of TSH levels in Newborn of Hypothyroid and Euthyroid Mothers

DHRUBA JYOTI NATH, SHRABANI BARMAN, JYOTISMITA DEKA, DIBAKAR DEY

Background : Hypothyroidism is a common problem in women during pregnancy which can lead to neonatal hypothyroidism. Babies born to mothers with thyroid disease often get thyroid function tests done randomly. Several studies on thyroid function tests in newborn suggest further studies to establish a relationship between maternal hypothyroidism and thyroid function of the newborn.

Objective : To determine the possible relationship between maternal hypothyroidism and TSH level of their newborn.

Materials and methods : The study (approved by the institutional ethical committee) was conducted on 107 newborns categorized in two groups, Group I (Babies born to known hypothyroid mothers) and Group II (Babies born to euthyroid mothers). TSH level was estimated on the day 4 in each baby by Enzyme Linked Fluorescent Assay using mini VIDAS in the Department of Physiology, Silchar Medical College. Statistical analysis was done using MS Excel 2007. Large sample test (z-test) was performed to assess the significance of difference of proportions of incidence with high TSH in newborns in Group I and Group II

Results : 4.67% of newborns (3 in group I and 2 in group II) had TSH > 20 µIU/ml and 19.63% of newborns (12 in group I and 9 in group II) had TSH more than 10 µIU/ml but less than 20 µIU/ml. There was no statistically significant difference in the incidence of high TSH in newborn of hypothyroid and euthyroid mothers.

Conclusion: The overall incidence of hyperthyrotropinemia in newborn is quite high irrespective of maternal thyroid status highlighting the urgent need for TSH test in all newborn.

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O/ER/5

Whole Human Genome Transcriptomic Analysis Identifies Overt Differences between Endometrium of Subfertile Patients with and without Ovarian Endometriosis

BHAT M A, KHAN M A, ROY K K, SHARMA J B, GHOSH D

Background : There is no large scale transcriptomic analysis of endometrium to explore differences in their expressions in eutopic endometrium obtained from subfertile women with and without ovarian endometriosis.

Objectives : Based on whole human genome transcriptomic analysis, the differences between endometrium of subfertile patients having stage IV ovarian endometriosis and patients without endometriosis during the proliferative and secretory phases of menstrual cycles were examined.

Methods : Endometrial samples were collected from subfertile patients (n=24) with stage IV ovarian endometriosis and from subfertile patients with normal endometrium. Total RNA was extracted and 22 samples (RIN >8.0) were subjected to whole genome expression microarray. The quality control passed samples (n=20) were further analyzed using GeneSpring v13.1.1 software to unravel clustering pattern and differential expression. The data were further subjected to enrichment analysis using GeneGO MetaCore Web portal.

Results : Exploratory analysis identified overt differences between endometrium of subfertile groups with and without ovarian endometriosis. The differential expression between eutopic endometrium of ovarian endometriosis and normal endometrium identified 237 genes in the proliferative phase and 78 genes in the secretory phase, respectively. Functional genomics revealed the fate of differentially expressed genes to be associated with regulation of cell differentiation and transcription initiation in proliferative phase and enzyme linked receptor protein signaling pathway and regulation of immune response in secretory phase of menstrual cycle between eutopic and control endometrium.

Conclusions : The whole genome analysis reflects high order of pathophysiological leads which would help towards a better understanding, management and probable non-invasive treatment of ovarian endometriosis.

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O/E R/6

The Correlation of Fasting Blood Insulin Levels with Blood Pressure in Normal Subjects and in Patients of Type 2 Diabetes Mellitus

RICHA SRIVASTAV, SANJAY PATEL,
ANKITA PRAKASH

Background : Hypertension (HT) is a common finding with type2 diabetes mellitus (DM). Either it coexists or precedes diabetes. HT is absence of diabetic nephropathy can be linked to high insulin levels in normal subjects as well as in diabetics.

Objective : This study was conducted to study the relation of blood insulin levels with blood pressure in normal and diabetic individuals.

Materials and methods : A cross sectional study on 30 subjects inclusive of normal and diabetic individuals were done. All the subjects were examined for fasting blood insulin levels and blood pressure.

Results : Out of 30 subjects studied, 10 were not diabetics and 20 were non-diabetics. On studying levels of fasting insulin in both the groups, 20% of normal subjects had hyperinsulinemia, out of which 50% were hypertensives; 30% of diabetics had hyperinsulinemia, out of which 83.3% were hypertensives. Mean value for fasting insulin were 17.3 ± 4.9 microunits /ml in diabetics and 13.8 ± 3.24 microunits/ml in normal subjects. Odds ratio between hyperinsulinemia and HT were indicating the correlation between two.

Conclusion : The study indicates that insulin has a causal relationship with BP, because of its effect on sodium retention as well as trophic effect on blood vessel endothelium.

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O/E R/7

Prevalence of Metabolic syndrome in Psoriasis and levels of IL-6 and TNF- α in psoriasis patients with metabolic syndrome: Indian tertiary care hospital study

SURJIT SINGH

Background: Psoriasis is a chronic inflammatory multisystem disease, associated with metabolic syndrome (MS).

Objective: To evaluate the prevalence of MS along with levels of IL-6 and TNF- α in psoriasis with MS.

Material and Methods: A tertiary care centre based case control study on 334 psoriasis patients and 230 controls.

Results: MS was significantly more common in psoriasis patients than in controls [Multivariate OR (95% CI) of Original NCEP ATP III = 5.73 (2.99 – 10.99), Revised NCEP ATP III = 4.44 (2.43 – 8.10), Modified NCEP ATP III = 6.00 (3.43 – 10.52)]. Higher prevalence of abdominal obesity (66.2 % vs 47%, p value < 0.001), hypertriglyceridemia (40.4% vs 29.6%, p value = 0.009), systolic BP \geq 130 mm Hg (25.1% vs 7.4%, p value < 0.001), Diastolic BP \geq 85 mm Hg (30.2% vs 12.2%, p value < 0.001), fasting plasma glucose \geq 100 mg/dl (17.4% vs 9.1%, p value = 0.005) among psoriasis patients as compared to controls. Joint involvement was significantly more common in psoriasis with MS as compared to psoriasis without MS (p value = 0.001). Mean (SD) values of IL-6 and TNF- α were 76.7 (73.9) pg/ml and 234.3 (273.9) in subgroup of psoriasis patients with MS (n = 42), significantly higher than the normal population (p value < 0.0001).

Conclusion: MS is more common in psoriasis patients. Levels of IL-6 and TNF- α is significantly higher in psoriasis patients with MS, signifying the role of these cytokines in pathogenesis of psoriasis and MS.

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O4. Gastrointestinal Physiology

O/GIT/1

Bisphenol a depresses the Contractile Functions of Rat Ileum and Colon in Vitro

MALOY B MANDAL, KUMARI NIRJA

Background : BisphenolA (BPA) is an extensively used chemical for production of polycarbonate plastics and epoxy resins that are employed in manufacturing plastic bottles and food containers. The toxic effects of BPA on endocrine and reproductive systems are well documented and believed to be mediated via oestrogen receptors. However, its effect on gut motility remains to be explored.

Objectives : The present study aimed to assess the effect of BPA on contractility of rat small and large intestine.

Material and Methods : In vitro isometric contractile tension from segments (15-20 mm) of ileum and colons of adult albino rats were recorded using organ bath preparations. The recording of spontaneously occurring contractions was made with the help of force transducer and computerised data acquisition system, before and after

application of BPA (1, 10, 30 and 100 micromolar bath concentration). The responses of BPA were further evaluated with pre-treatment of antagonists viz. oestrogen receptor antagonist tamoxifen, nitric oxide (NO) synthase inhibitor L-NAME, ganglion blocker hexamethonium and muscarinic antagonist atropine to understand the mechanism of action.

Results : BPA reduced contractile tension and frequency in a dose dependent manner. The tension was reduced by 70-80% with 100 micromolar BPA. None of the antagonists used in the investigation could reverse the attenuating effect of BPA.

Conclusion : isphenol A decreases the contractile functions of rat ileum and colon in vitro, possibly without involving estrogen receptor, NO system and neuronal elements.

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O/GIT/2

A study on 5-HT induced contractile responses of large gut in neonate rats.

SHUCHITA SINGH, M B MANDAL

Background : Serotonin or 5-hydroxytryptamine (5-HT) is a monoamine neurotransmitter and one of the key mediators in the physiology of gut motility. However, little is known about the role of 5-HT and its receptors in neonate gut contractility.

Objective : The present study aimed to assess the role of 5-HT in mediating contractile responses of large gut in neonate rats.

Materials and methods : Using organ bath preparations, in vitro isometric contractions were recorded from isolated gut segments (colon and rectum) obtained from neonate albino rats. Spontaneously occurring contractions were recorded with the help of force transducer and computerized chart recorder, in the presence or absence of 5-HT. Further, the action of 5-HT was evaluated after pretreatment of various antagonists. Similar recording was also made from adult rat gut for the purpose of comparison.

Results : 5-HT (0.01-10 μ M) produced higher contractile response (g/g wet tissue, P<0.05) in both colon and rectum of neonate rats, as compared to adult. Pre-application of ondansetron, a 5-HT₃ antagonist, failed to block 5-HT induced contractile response in neonate rectum but not in adult. However, methysergide, a 5-HT_{1/2/5-7} antagonist, inhibited the response in both adult and neonate rectum. Further, muscarinic cholinergic blocker- atropine and ganglion blocker- hexamethonium did not attenuate the 5-HT induced responses in both colon and rectum of neonate and adult rats.

Conclusion : Neonate has stronger role of 5-HT in colon and rectal contractile functions without involving

cholinergic or ganglion elements. However, unlike adult, action of 5-HT on neonate rectum appeared to be mediated via non- 5-HT₃ receptor subtypes.

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O5. Respiratory Physiology

O/RP/1

Assessment of Pulmonary status, smoking profile and mode of initial presentation in patients of Ca Lung.

**JAYSHREE PHURAILATPAM,
B ARUNKUMAR SHARMA, Y INDIBOR SINGH**

Background: Ca Lung has emerged as the leading cause of death among all cancers worldwide as well as in the North-East Indian state of Manipur. Pulmonary assessment through PFT forms an important part in the management of this condition.

Objective: to evaluate lung functions in patients of Lung cancer, correlate their smoking status retrospectively with their disease condition and assess their mode of initial presentation.

Material and Methods: 26 recently diagnosed cases of Lung cancer attending Regional Cancer Centre, RIMS Hospital, Imphal having a Karnofsky performance scoring (KPS) >60% were randomly selected, detailed smoking history and mode of initial presentation assessed. Pulmonary functions were then evaluated through a computerized spirometer HELIOS 702 (RMS, Chandigarh).

Results: Out of 26 patients evaluated, 21 (80.77%) were active smokers (duration>40-60 years), 3(11.6%) non-smokers (1: heavy tobacco user in other forms) and 2 (7.69%) passive smokers, younger in age and exposed to smoking for around 20years. 19 cases (73.1%) initially presented with tubercular-like symptoms but all AFB-ve; 4 cases had other significant associated diseases while 3 had no other complaints. Pulmonary function assessment showed 4 cases as normal, 19 (73.1%) having restrictive pattern and 3 with mixed blockage.

Conclusion: Irrespective of gender, most cases of Lung cancer show a prolonged exposure to smoke and majority mimicked tuberculosis. Though active smoking is known to cause lung cancer, the study documents that passive smoking is also deleterious, lung cancer appears much earlier and is associated with a lesser duration of exposure. The main lung dysfunctional pattern in Ca Lung patients is restrictive.

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O/RP/2

Modulation of hypoglossal nerve (HGN) activity in rats exposed to chronic intermittent hypoxia (CIH)

**PREETI SOLANKI, RAMAN GHAI,
KRISHNAN RAVI**

Background : The central mechanisms modulating the hypoglossal motoneuron output responsible for repeated episodes of airway occlusion reported in patients with obstructive sleep apnea (OSA) are not established.

Objective : To evaluate the effect of excitatory central neurotransmitters- serotonin and glutamate -microinjected into the hypoglossal nucleus, in modulating HGN activity in rat model of CIH mimicking the hypoxia-reoxygenation pattern observed in OSA.

Materials and methods : Adult male Wistar rats were divided into 2 groups- Control (room air for 35 days, n=6) and CIH (2 min of 99% N₂ followed by 8 min of 21% O₂, 6 episodes/hr and 8 hrs/day, for 35 days, n=6). Subsequently, each rat was anaesthetized (urethane 1g/kg b.w., i.p.), a cannula for microinjections implanted stereotaxically into the hypoglossal nucleus, HGN exposed in the neck and prepared for recording neural activity. Changes in HGN activity to injections of serotonin (10 nmoles) and glutamate (10 nmoles) into hypoglossal nucleus were observed in both the groups and compared

Results : Compared to control, CIH for 5 weeks induced increases in mean arterial blood pressure (81.79 \pm 17.88 vs 108.55 \pm 11.99 mmHg, p<0.05) and heart rate (301.97 \pm 34.98 vs 351.29 \pm 24.49 bpm, p<0.05), reduced basal (tonic) activity of the HGN (11.41 \pm 4.07 vs 3.69 \pm 0.94 mV.sec, p<0.01), and decreased responsiveness of the HGN to agonists (Serotonin-206.01 \pm 23.42 vs 53.19 \pm 19.4 %, p<0.01; Glutamate-90.65 \pm 16.70 vs 69.42 \pm 15.39 %, p<0.05).

Conclusion : The recurrent narrowing and collapse of upper airways reported in OSA patients could be due to depression in HGN activity as a result of decrease in release of excitatory neurotransmitters in the brain.

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O/RP/3

Role of Vagus in mediating Indomethacin-induced exacerbation of ARDS in rats

RATNA PANDEY

Background: Acute respiratory distress syndrome (ARDS) is a syndrome associated with inflammation and lung

injury. ARDS confers substantial morbidity and mortality, and have no specific therapy.

Objective: Prostaglandin and other inflammatory mediators are implicated in the pathophysiology of ARDS. Prostaglandins are known to stimulate vagal fibres. The present study was undertaken to elucidate the effect of prostaglandin in ARDS and the role of vagus nerve in mediating these effects.

Materials and Methods: Tracheal and jugular vein cannulation was done in anesthetized rats. Animals were divided into four groups; Group I (saline treated control group), Group II (oleic acid/OA, 75 μ L treated group), Group III (indomethacin, 10 mg/kg + OA treated group) and Group IV (vagotomy + indomethacin + OA group). In all the experiments, respiratory frequency (RF) was recorded and lungs were taken out at the end for determination of pulmonary water content and histological examination. In group I and II, PaO₂/ FiO₂ ratio was also determined.

Results: OA produced ARDS indicated by initial increase in RF followed by progressive decrease leading to death of the animals within 75 min. Pulmonary water content was significantly greater than control group and PaO₂/ FiO₂ ratio was 186 mm Hg. Lung histology exhibited pulmonary edema, damage to alveolar-capillary barrier and infiltration of inflammatory cell. Prostaglandin synthesis inhibitor (indomethacin) pretreated animals, showed progressive decrease in RF after OA injection and the animals died by 10 min. Pulmonary water content was greater than control and histology manifested exacerbation of lung injury. Bilateral vagotomy did not alter the changes produced by OA injection in indomethacin pretreated rats.

Conclusion: Indomethacin-induced exacerbation of lung injury by OA is not mediated by vagus.

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O/RP/4

Pattern and profile of pulmonary dysfunctions in patients of sickle cell anemia in central India

**SUMEET TRIPATHI, EKTA KHANDELWAL,
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Background: Pulmonary dysfunctions due to sickle cell disease (SCD) are one of the leading cause of morbidity and mortality in central India. Although hypoxemia and respiratory disease are risk factors for vaso-occlusive crisis in patients with SCD, the mechanisms remain unclear. Obstructive and restrictive pulmonary changes develop in patients with SCD, but reports conflict as to the type of change that predominates.

Objective: To compare pulmonary functions of SCD patients with controls and to understand the pathophysiology & pattern of distribution of pulmonary dysfunctions in SCD.

Material and Methods: 140 patients of age 10 to 58 years and 151 control of age 10 to 60 years were compared for pulmonary functions. Both groups were investigated for complete Hemogram, Echocardiography, Sickling test, Hemoglobin (Hb) electrophoresis. The results were statistically analyzed.

Results: SCD group FVC, FEV1, PEF, FEF25%-75% and MVV were lower as compare to control groups in both sexes. The difference in FEV1, PEF, and FEF 25%-75% is statistically significant ($p < 0.05$) after the age of 20 years and in FVC after the age of 30 years in both the sexes. MVV was statistically significant after 20 years of age in females and 30 years in males. Obstructive, restrictive and mixed patterns of lung function abnormalities were observed, of which the restrictive pattern was predominant.

Conclusion: Pulmonary function is abnormal in Patients with Hb-SS & AS. It is likely that abnormal pulmonary function reflects intrinsic lung disease in these patients and that the mechanisms are more complex in this population than originally appreciated.

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O/RP/5

Comparison of ventilator function test among non-smoker, smoker and smoker brick kiln workers

**VISHAL GOEL, SHELJA, SURJIT SINGH,
SUSHMA SOOD, SURINDER KAUR,
ASHISH ARVIND**

Background : Pulmonary function test, chest x-ray and CT scan are common diagnostic tools for diagnosing respiratory diseases. Diseases and conditions of respiratory system are generally caused by inhalation of foreign bodies such as cigarette smoke, chemicals, allergens and other irritants.

Objectives : The objective of this study was to compare Ventilatory functions in nonsmokers, smokers and smoker brick kiln workers to analyze the extent of impairment in the airways.

Material and methods : The Pulmonary Function tests were conducted on 75 subjects of which 25 were taken as the control group and other 50 as the study group. The control group subjects were non smoker males randomly selected from general population. The study group was categorized into 2 major groups i.e. Group-1 or G1

included smoker males randomly selected from general population. Group-2 or G2 included smoker brick kiln workers who have worked in brick kilns for more than 10 years. Parameters recorded were PEFR, FEV1, FVC, FEF25-75% and FEV1/FVC%.

Results : "First, we have done comparison of ventilatory functions between nonsmokers and smokers. It was observed that values of PEFR, FEV1, FEV1/FVC and FEF25-75% significantly decreased in smokers (p value <0.001) as compared to non smokers. Our results indicate that smokers are at high risk of developing narrowing of airways in comparison to non smokers depicted by lowering of FEF25-75% (p value <0.001).

Further we have compared the ventilatory functions between smoker brick kiln workers with non smokers and smokers individually. The result shows that there is more decrease in values of PEFR, FEV1, FVC, FEV1/FVC and FEF25-75% in smoker brick kiln workers (p value <0.001).

FVC is not significantly reduced in smokers as compared to smoker brick kiln workers.

Conclusion : Smokers are at high risk of developing obstructive airway diseases. But Smoker brick kiln worker whose duration of working in brick kiln is more than 10 years are susceptible of developing mixed pattern of obstructive or/and restrictive ventilatory impairment.

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O6. Life Style

O/Life Style/1

Regular exercise enhances the cardio pulmonary functions to cope the after load during sub maximal hemodynamic activity

**DILEEP KUMAR VERMA, JAGDISH NARAYAN ,
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JAYVARDHAN SINGH, PRADEEP KUMAR,
SHRADDHA SINGH**

Background : Cardio- Pulmonary Fitness refers to the ability to supply oxygen to skeletal muscle during physical activity. Regular exercise makes these systems more efficient. How the regular exercise training improves the fitness, it is a matter of controversy.

Objectives: The objective of present study were to compare the heart rate (HR), systolic blood pressure (SBP) & Diastolic blood pressure (DBP) in apparently healthy persons during different stages of sub maximal Bruce protocol.

Material & Methods : Present study was conducted in healthy male medical students , divided into two groups based on inclusion and exclusion criteria. Group -1, consisted on non irregular exercising male subjects and Group 2 consisted of regularly exercising male subjects. Sub maximal exercises were given according to Bruce protocol.

Results : No significant difference ($P>0.05$) was observed in heart rate & systolic blood pressure during different stages of exercise while we observed significant difference ($P<0.05$) in diastolic blood pressure.

Conclusion : Regular exercise enable our cardio-pulmonary system to cope the after load during high cardiac activity.

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O/Life Style/2

Efficacy of 8 week integrated Yoga on psychophysiological profile of primigravida

POOJA CHATTERJEE, BRIJESH PURWAR

Background : Late motherhood has become a global reality today .This demographic phenomenon brings various feto- maternal complications which pose a challenge in care to health care provider, be it at the primary, district/secondary, or, tertiary level . The study aims to study the efficacy of 8week integrated yoga (pranayama, dhyana and dharana by om meditation,rajyoga) on psychophysiological profile of primigravida, N=60(30 each in study and control gp.) ,age = 30-45 years ,in second trimester. Assesment comprised of State And Trait anxiety questionnaire, heart rate variability (H.R.V) and cognitive evoked potential (P300).

Objectives : To study the efficacy of 8 week integrated yoga (pranayama, dhyana and dharana by OM meditation, Rajyoga) on primigravida (age=30-45yrs). To compare the psychophysiological profile by Speilbergerâ€™s State and Trait Anxiety Form Y-1, Heart Rate Variability (lf,hf,lf/hf ratio), and cognitive evoked potentiall (P300) ofprimigravida(age=30=45yrs),uncomplicated pregnancy before and after 8 weeks.

Material and methods : The study included 60 primigravida(age=30-45yrs),in second trimester, with uncomplicated pregnancy undergoing routine antenatal care, stratified equally into yoga(n=30) and control group(n=30). The yoga group performed pranayams (nadishuddhi and brahmari), dhyana and dharana meditation(OM mantra by His Holiness Swami Rama), and Rajyoga meditation for 30-45 mins daily for 8weeks,while controls simply continued routine antenatal care. Basal

recordings of Speilbergerâ€™s State and Trait Anxiety FormY-1, Heart Rate Variability (lf,hf,lf/hf ratio), Cognitive Evoked Potential(P300)(amplitude and latency) were recorded initially and after 8 weeks in both groups.

Results : The yoga group group showed reduction in anxiety as seen by questionnare trend. Significant changes were seen in Heart Rate Variability, by hf increased ($p\leq,0.01$), lf decreased ($p\leq,0.01$), and decreased lf/hf ratio($p\leq,0.001$).P300 showed decrease in both amplitude and latency ($p\leq,0.01$).In the control group anxiety showed an upward trend with increased lf,hf and lf/hf ratio. P300 pre and post showed no changes .

Conclusion : Decreased state anxiety with increased parasympathetic activity as seen in HRV, prove the benefits of this ,integrated yoga. Since the findings on P300is novel with this format randomised study for validation is needed.

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O/Life Style/3

Comparative effect of treadmill and yoga on MDA level in normal young adults

RUCHA D WAGH

Background : Beyond a certain point, stress stops being useful and leads to major damage to our health, productivity, relationship and quality of life. Stress has misled the young's of today because of which they have opted for various ways in life which can lead them to crime and depression. Such behavior is responsible for the production of free radicals in human body.

Objective : To study the comparative effect of treadmill and yoga on MDA level.

Materials and methods : The following observational study was conducted in Department of Physiology at Exercise Physiology Lab (JNMC, DMIMS, Sawangi Meghe, Wardha). Fifty male subjects of age group 18-20years were divided into two groups, treadmill exercise (Group A) and yoga (Group B) consisting of 25 each. Group A performed the exercise as per Bruce Protocol 5 days a week and Group B performed the three basic steps of asana (Suryanamaskar), pranayam (Anulom-Vilom) and Raj yoga meditation for similar time period. Based upon regular performance of exercise, blood samples of these subjects were assessed for Malondialdehyde levels at the start of and after 3 months of the training schedule. The other parameter assessed were vital parameters (heart rate, pulse rate) and VO2 max. Subjects were also assessed for their social and mental behavior by WHO-QOL questionnaire. Clearance from institutional ethical committee was taken. Results were compared using student

paired "t" test and unpaired "t" test & age-wise distribution by Chi-Square test.

Results : Results showed that the pre-exercise levels of MDA in Group A (1.30 ± 0.1) and Group B (1.23 ± 0.1) and the post-exercise levels in Group A (0.92 ± 0.2) and Group B (0.37 ± 0.2). There was an increase in the vital parameter in Group A whereas no significant changes were observed in Group B.

Conclusion : The above study shows that yoga has more beneficial effect than the treadmill exercise which leads to decrease in the free radical production.

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O7. Molecular Biology

O/Mol Bio/1

Folic acid deficiencies and maternal risk in Down's Syndrome

AMBREEN ASIM, SARITA AGARWA,
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Background: Down syndrome (DS) or trisomy 21 is the most common genetic cause of mental retardation, with an incidence of 1/700 ~ 1/1000 live births [1]. Folic acid is essential for the de novo synthesis of nucleotide precursors for normal DNA synthesis and cellular methylation reactions. MTHFR and MTRR are two genes involved in folate metabolism contribute to maternal risk for DS babies.

Objective: To explore the relationship between genetic polymorphisms in MTHFR, MTRR and the maternal risk of DS in North India.

Methods: Genomic DNA was isolated from the peripheral lymphocytes of 54 mothers of children with DS and 60 age matched control subjects. PCR-RFLP were used to evaluate the polymorphisms of MTHFR C677T, MTRR A66G and the risk of DS was analyzed.

Results : The frequency of T and G allele of MTHFR C677T and MTRR A66G polymorphisms respectively was found to be higher among mothers of DS cases (23.3 and 52.2% respectively) compared to controls (2.9 and 3.6% respectively). Genotype frequencies of CT in MTHFR C677T were higher among mothers of case than control (42.2% versus 26.0% respectively) with odds ratio 4.8 (95% CI 0.1868-121.51; P value-0.033) respectively. Genotype frequencies of GG in MTRR A66G was found to be significantly higher among mothers of case than controls

(95.5% versus 3%) with odds 2.4 (CI 0.0005-0.4965, P=0.0183) respectively.

Conclusion : Present study clearly indicates the genetic association of MTRR and MTHFR gene polymorphisms as maternal risk factors for DS.

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O/Mol Bio/2

Study of Mutational analysis of RET gene in Hirschsprung's disease

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Background: Hirschsprung's disease (HD) is an intestinal obstruction characterised by the failure of the migration of neural crest cells during fetal development that results in the absence of ganglion cells. Dysfunction of a number of genes, including RET (rearranged during transfection) gene have been implicated in the development of HD.

Objective: To do the mutation profile of RET gene in HD patients

Material and Methods: Blood samples (23 family, total 63 samples) from HD patients admitted in Department of Paediatric Surgery, Sir Sunderlal Hospital, Banaras Hindu University were collected. DNA was isolated and primers of exon 3, 4, 5 and 6 of RET gene were used for the polymerase chain reaction (PCR) to amplify DNA sequence. The purified PCR products were sequenced using the ABI Big Dye Terminator cycle sequencing kit. All sequence of exons of RET are analyzed by Clustal X and Mega 6 software. Mutated sequences were analyzed through Polyphen2 and Mutation taster to determine the impact of sequence variation on protein function

Results: The study showed two suspected variation in one sample. In this sample T was replaced by A in exon3 at the position of 249 leading to the change of amino acid phenyl alanine to isoleucine at 147 position. Also in this sample at the position of 591, deletion of cytosine residue has been observed and thus, caused the frame shift mutation in exon3

Conclusion: It may be suggested that genetic mutation in exon3 of RET gene may also be responsible for of HD in some cases

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O8. Phytomedicine

O/PM/1

Fibrinogenolytic, Fibrinolytic and blood stain removal activity of purified enzyme fractions from *Calotropis gigantea*

MAHESHWARI KUMARI SINGH

Background : Latex from *Calotropis gigantea* is known to be wealthy source of proteolytic enzymes that has diverse ethnopharmacological applications. Accumulating data on their wound healing potential is restricted only to crude enzyme. In order to shed more light into the specific protease/s involved and to understand the molecular mechanism behind, further purification is a prerequisite

Objective : To delineate hemostatic potential of the purified latex proteases from *C. gigantea*

Materials and methods : Crude, partially purified and purified latex protease fractions, LPF, (via anion exchange chromatography) were assessed for the caseinolytic activity, procoagulant potential (recalcification time of platelet poor plasma and fibrinogenolytic assay through Tricine PAGE) and fibrinolytic activity (blood clot lysis assay, blood Stain removal activity and human plasma clot lysis assay through Tricine PAGE).

Results : The purified LPF exhibited strong proteolytic activity when compared to crude and partially purified enzyme. The time taken for the clot formation was least for purified LPF (180 ± 0.2 to 39.36 ± 1.5 sec). LPF hydrolysed α , β and γ subunits of human fibrinogen in time dependent reaction. γ subunits which is highly resistant was also hydrolyzed within 15 minutes of incubation by the purified LPF unlike the crude which took more than 60 min. The % of blood clot lysis was high (86.32%) for purified LPF followed by partially purified and crude. All the three exhibited enhanced destaining of blood stained cloth. The LPF hydrolysed crude fibrin clot completely when visualized on Tricine PAGE

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O/PM/2

Psidium Guajava reinstates hepatic PI3K/AKT and JAK-STAT3 cascade in rodent model of fructose induced metabolic syndrome

RAJANI MATHUR, PREETY RAJORA,
RATIKA SEHGAL, UBAID NAEEM

Objective : Evaluate the effect of aqueous leaf extract of *Psidium guajava* (PG), against the metabolic correlates

developed in pathological state of metabolic syndrome induced by excess fructose consumption in developing rats.

Methods : Post-weaning Wistar albino rats (4week old, male) were randomly divided into NC, FC and PGT groups (n=6each) and provided *ad libitum* either chow+water, chow+fructose (15%) or chow+fructose (15%) + PG (500mg/kg/d, po) respectively, for 8 weeks. The following parameters were studied- total food and fructose intake, body weight, visceral weight, fasting blood glucose(FBG), oral glucose tolerance(OGTT), plasma insulin and leptin, serum lipid, liver glycogen, glucose-6-phosphatase, fructose-1,6-bisphosphatase and hexokinase. In addition, effect of PG on insulin and leptin downstream signaling pathways (hepaticPI3K/AKT, JAK-STAT3) were studied using human liver carcinoma cell line, HepG2, cultured under standard aseptic conditions and grown in DMEM enriched with FBS(12%). Using sensitive isocratic RP-HPLC method, each mg of PG was reported to contain 8.005 μ g of Quercetin.

Results : Significantly raised FBG,AUC-OGTT, serum lipid, visceral weight, plasma insulin & leptin, liver glycogen and gluconeogenesis enzyme levels and decreased hepatic glycolytic state was recorded in FC as compared to NC. Hepatic levels of PI3K/AKT and JAK-STAT3 were downregulated in FC indicating state of insulin and leptin resistance. Taken together, state of metabolic syndrome was created in FC. PGT recorded significant reduction of anthropometric and glycemic parameters, reinforcement of hepatic glycolytic over gluconeogenic pathway and elevated levels of PI3K/AKT and JAK-STAT3 pathways, as compared to FC. Independent elevation of these pathways by PG in HepG2 cell line further evidenced the mechanistic basis of its *in vivo* action.

Conclusion : PG significantly restored the glycolytic over gluconeogenic pathway along with increasing insulin and leptin sensitivity in the hepatocytes to ameliorate fructose induced MS in rats.

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O/PM/3

Does Cleistanthin A modulate proton currents of human neutrophils in the presence of ATP?

V ABIRAMI, PRAGHALATHAN
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Background : *Cleistanthus collinus* is a poisonous plant, the leaves of which are consumed for suicide in many parts of southern India. Exact mechanism of toxicity remains unclear. Previously, two toxic principles from the plant namely, Cleistanthin A and Cleistanthin C were tested for proton channel blockade in human neutrophils. While

neither compound blocked proton channels, the impression was that Cleistanthin A may actually enhance proton currents, though the increase was not statistically significant. Since ATP was not present in the pipette in the earlier experiments, we hypothesized that in the presence of ATP, Cleistanthin A may enhance proton currents significantly. This data is important because it will help us establish this effect as the mechanism of toxicity leading to respiratory arrest in cases of *Cleistanthus collinus* poisoning.

Objective : To compare the percentage of proton currents remaining after the addition of the test (Cleistanthin A) or control (Ethanol), as compared to the currents recorded before the addition, while ATP was included in the patch pipette

Materials and methods :

- Isolation of fresh human neutrophils
- Isolation of Cleistanthin A
- Recording proton currents on isolated neutrophils by Patch Clamp technique
- Analysis of the percentage of proton currents remaining after the addition of the test or control solution

Results : When the test and control groups were compared at different voltages, the difference in percentage current remaining across both groups was not statistically significant.

Conclusion : The results indicate that even in the presence of ATP, Cleistanthin A does not show any significant effect on voltage gated proton channels of human neutrophils.

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O9. Pharmacology

O/Pharma/1

Possible involvement of the nucleoside transporters in the ocular kinetics of intravitreally administered Ribavirin

**HANUMAN PRASAD SHARMA, BASKAR SINGH,
NABANITA HALDER, T. VELPANDIAN**

Background : Being a nucleoside analogue, ribavirin is highly water soluble and can't be transported across cellular membrane without the help of nucleoside transporters. Till date the role of these transporters has not been fully understood in the blood ocular barriers.

Objectives : The presence & functional assessment of the nucleoside transporters in the transportation of ribavirin across blood ocular barriers were conducted using RT-PCR and pharmacological tools.

Material and methods : The animal study was approved by the institutional animal ethics committee. Ribavirin was intravitreally injected into the rabbits (n=4) in presence and absence of blocker S-(4-Nitrobenzyl)-6-thioinosine (NBMPR) at a suitable substrate concentration for the nucleoside transporters. After one hour of substrate injection blood and ocular tissues were collected and stored at -80 °C till analysis . Concentration of ribavirin was analyzed by validated LC-MS/MS method.

Results : All the endogenous interferences could be separated from the analytical peak (ribavirin) without compromising sensitivity of the method. The method was capable enough to detect ribavirin as low as 5 ng/ml in ocular fluids (aqueous and vitreous humors) as well as in plasma. Vitreous to blood concentration of ribavirin was found to be 4 times less in presence of blocker. The presence of the ribavirin transporters was also confirmed by RT-PCR.

Conclusion : The differential substrate movement across blood ocular barrier in presence and absence of blocker is indicating the possible involvement of the nucleoside transporters.

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O/Pharma/2

Analgesic prescribing practices of dental practitioners in National Capital Region of India

**POOJA GUPTA, HIMIKA WASAN,
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Objective : To investigate the prescribing pattern of analgesics and their fixed dose combinations among dental practitioners of National Capital Region of India.

Material and Methods : A self-designed questionnaire was administered to 667 dental practitioners holding degrees of Bachelors, Masters and those pursuing their masters, working in academic institutes and private clinics, of whom 539 (80.8%) responded. Pearson chi square and Fisher's exact test were used for analysis.

Results : Out of 539 responders, 66.4% prescribe by brand name, 27.8% by generic and 5.2% prescribe by both generic and brand name. Of the total analgesics prescribed, 48.6% are prescribed as fixed dose combinations (FDCs). Ibuprofen+paracetamol (22.9%) is the first choice. Serratiopeptidase and other proteolytic enzyme based combinations constitute 22.6% of total FDCs prescribed. Ibuprofen + paracetamol (39.4%) and ketorolac (67.6%) are the preferred analgesic for mild to moderate pain and severe pain respectively. Nimesulide is prescribed by 7.8% practitioners for pain in children of <12 years age. Analgesic induced gastric adverse effects have been

observed by 69.6% practitioners and are managed by prescribing antacids (65.6%) and proton pump inhibitors (30.7%). Of the total FDCs prescribed, 71.9% are considered to be rational.

Conclusion: Analgesic prescribing is not always evidence based and irrational use of analgesic FDCs is likely to increase the risk of ADRs as well as overall healthcare cost. There is an urgent need of guidelines and continuing medical education to improve the prescribing practices.

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O/Pharma/3

Protective effect of Taurine against Streptozotocin-induced cognitive impairment in sporadic model of Alzheimer's disease in rats

REETA K H, DEVENDRA SINGH, GUPTA YK

Background : Taurine (2-amino-ethanesulfonic acid) has shown neuroprotective effect by acting through multiple mechanisms. Alzheimer's disease is a common progressive neurodegenerative disorder affecting millions of people worldwide.

Objective : To evaluate the protective effect of taurine in a sporadic model of Alzheimer's disease in rats.

Methods : Male Wistar rats (250-300 g) were divided into 7 groups: Normal, Sham, Streptozotocin (STZ), STZ + Taurine (40, 60 and 120 mg/kg, p.o. administered from days 1 to 28) and Taurine *per-se*. STZ, 3 mg/kg, dissolved in artificial CSF, was injected by intracerebroventricular route stereotaxically (0.8 posterior, 1.5 mm lateral and 3.6 mm ventral) on day 1. Cognitive impairment was assessed using a battery of neurobehavioral tests performed on days 0, 14 and 28. Biochemical parameters were estimated both in cortex and hippocampus at the end of study period.

Results : STZ produced significant impairment of learning and memory behaviour as shown by increased escape latency and decreased time spent in target quadrant in Morris water maze test, increased retention latency in elevated plus maze and decreased transfer latency in passive avoidance paradigm on days 14 and 28. Taurine caused significant improvement and reversed the changes produced by STZ in a dose-dependent manner.

Reduced glutathione level and superoxide dismutase activity were decreased while malondialdehyde, nitric oxide, acetylcholinesterase and butyrylcholinesterase levels were increased in STZ group. Taurine restored their levels towards normal both in cortex and hippocampus.

Conclusion : This study demonstrates protective effect of taurine against STZ-induced cognitive impairment in sporadic model of Alzheimer's disease in rats.

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O/OP/1

Rapid synthesis method for biological pigment A2E and developing LC-ESI-MS method for lipofuscin

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Background : Age related macular degeneration (AMD) is one of the leading cause of blindness worldwide in the elderly population. Lipofuscin are the components deposits in retinal pigment epithelial cells of human retina which are known to be responsible for the progression of AMD. Formation of lipofuscin in aging human retina has been associated with the development of Age related macular degeneration.

Objective : Therefore, the objective of this study is to develop a rapid synthesis method for one of its component A2E for its quantification and developing method for the analysis of lipofuscin components in human cadaveric retina for deriving the correlation.

Materials and methods : A mixture of two molecule of all-trans retinal and one molecule of ethanolamine was subjected for microwave assisted synthesis of A2E under dark condition and progress of the reaction was monitored using by TLC, purified and characterized by NMR, Mass, UV and IR spectroscopy. Semi-purified hydrophobic cadaveric human retinal extracts were subjected for separation and individual component identification using ESI-LC-MS/MS using IDA protocol using Xterra column. Lipofuscin components at corresponding retention time was confirmed by by APCI-MRM and ESI-MRM for its proposed use in ESI-SIM modes

Results : Microwave assisted synthesis method has shortened the conversion of all-trans retinal to A2E and was confirmed by NMR, Mass, UV and IR spectroscopy with 70% yield. Method developed for simultaneous quantification of lipofuscin components that includes 258.2 for all-trans retinal, 592.4 for A2E, 551.5 for all-trans-retinal dimer, 595.8 for all-trans-retinal dimer ethanolamine, 594.9 for A-2-dihydrophosphoethanolamine, 608.4 for monofuranA-2-E, 624.9 for monoperoxy A-2-E and 746.9 for A-2-glycerophosphoethanolamine using LC-ESI-SIM mode.

Conclusion : The method optimized through microwave is a rapid method capable of yielding high pure A2E for quantitative and cell culture experiments. The ESI-LC-MS

method optimized is capable of identifying other components of lipofuscin involved in the pathogenesis of AMD.

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O/OP/2

Diabetic Induced Changes in Blood Ocular Barrier Permeability: Relevance to Glutamate Induced excitotoxicity

**THIRUMURTHY VELPANDIAN,
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S N DAS**

Background : Presence of transporters is well studied in blood retinal barriers which in turn regulates the transfer of their substrates across the retina at times even against concentration gradient.

Objective : This study evaluated the expression of retinal glutamate transporters in the streptozotocin (STZ) induced diabetic model in rats and its neurological and functional consequences in the ocular system.

Material and Methods : Diabetes was induced using STZ in Wistar Rats. Electroretinography and fundus angiography were carried out at periodic intervals in diabetic animals to assess retinal function and vasculature respectively. Expression of 15 transporters of ABC and SLC family-importantly glutamate transporter were studied by using qRT-PCR on day 10, 20, and 30. The levels of glutamate substrate in vitreous was quantified. Integrity of blood retinal barrier was assessed by using vitreous to blood ratio of ofloxacin levels by LC-MS/MS.

Results : In the experimental period of 30 days, significant changes in ERG were observed initially at 10th day along with concordant 40 fold increase in glutamate transporters expression (SLC1A1,SLC1A3) at 20th and 30th day. Significant increase of glutamate concentrations in vitreous and increased vitreous to blood ratio of probe was found at the end of the experimental period.

Conclusion : Results of this study indicate the initial steps leading to excitotoxicity in diabetes preceding vascular complications in diabetes. The timeline of the progression of the neuronal changes and the blood retinal barrier dysfunction in rat model suggested the need for earlier intervention in the neuronal complications in diabetic patients.

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O/OP/3

Tear levels of Antimicrobial agents through lacrimal secretion: Targeting organic cation transporter

**UJJWAL KUMAR DAS, NATH M, HALDER N,
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Background : Cationic charge of gentamicin at physiological pH is reported to behave as a substrate of organic cation transporters (OCT). Therefore, the present study evaluated the possibility of targeting lacrimal OCTs for the delivery of gentamicin in the precorneal area after systemic administration.

Objective :

1. To determine tear levels of gentamicin components after i.v. administration in rabbit in absence and presence of OCT blockers.
2. To compare tear to plasma ratio of gentamicin components in rabbits using different OCT blockers.

Materials and methods : New Zealand albino rabbits of either sex weighing (1.9-2.2kg) were used for this study and were randomized into three groups. All the groups received, intravenous gentamicin sulfate (having the mixture of C1, C1a and C2a&b) at a dose of 5mg/kg. Group I, I & III were instilled 50µl saline, quinidine sulfate (6.13mM) and atropine sulfate (3.47mM) topical solution 30 minutes prior to the injection of intravenous gentamicin. Blood samples were collected at different time points (0, 0.25, 0.5, 1, 2, 4, 6, 8, 12 and 24 hr) along with tear samples by using a calibrated Schirmer's strips. The plasma and tear samples were quantified for gentamicin using highly sensitive method by ESI-LC-MS/MS having appropriate mass transitions for gentamicin components in presence and absence of OCTs blocker.

Results : Gentamicin showed an increasing trend in tear to plasma (t/p) ratio varying from 1-35% over the period of 24hrs. Highly cationic gentamicin C1a (with 4 amino groups) was found to have t/p ratio of 52 at 24hrs which was higher than other compounds with lesser amino group. Significant decline was found in the level of gentamicin components in presence of OCT blockers (quinidine and atropine). Tear concentrations were found to be independent of plasma concentration as the slope of falling plasma levels did not correlate with the tear levels indicating the possible role of OCT in the lacrimal gland.

Conclusion Cationic charge of gentamicin could be responsible for its tear levels, indicating the possibility of using lacrimal organic cation transporters to deliver antimicrobial agents.

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O10. Miscellaneous

O/Mis/1

Academic study of undergraduate M.B.B.S students about teaching methods and evaluation during first year MBBS Course

SHILPA GUPTA, ASHOK RATHOD

Background : As an academician we teach physiology but we don't know students' feedback whether they like it or not. We do not have perceptions of students.

Objective : This study aims at receiving feedback from the students, regarding teaching methodology practiced during teaching physiology at this institute. This will help in deciding methods while teaching physiology.

Materials and methods : Cross-sectional study involving 130 undergraduate students having completed one year course, were provided with questionnaire pertaining to teaching methods in physiology. Informed consent of the students was taken. Permission of Institutional Ethical committee also obtained.

Results : Responses were analysed statistically. 40 % students prefer 45 minutes lecture, 45 % prefer lecture as teaching method. 44% prefer chalk board as teaching aid. For 57% MCQ is the choice of assessment method. 70 % preferred formative assessment. 83% felt 9 -11 is the best time for lecture. 33% students enjoyed CVS most. 39% felt that blood should be taught first. 82% preferred one year duration course. 58% felt anatomy as toughest subject.

Conclusion : One year course is accepted by students. Anatomy is toughest of all subjects followed by physiology. CVS is the most liked system. Physiology teaching should start with Blood followed by other systems. Regarding teaching methodology students prefer lecture. They also prefer Chalkboard and powerpoint as teaching tools. MCQ is the preferred method of assessment. Formative assessment is preferred, whereas students prefer lectures in the morning hours. Modification in teaching methodology can be done according to the perceptions of students.

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O/Mis/2

Gender difference in the level of stress experienced among medical students

**SARANYA KUPPUSAMY, PUNITA
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Background : Medical training constantly exposes the students to stressors. The Medical Student Stressor Questionnaire (MSSQ) is valid in measuring the stress in medical students. MSSQ categorizes stressors into 6 domains: Academic Related Stressors (ARS), Intrapersonal and Interpersonal Related Stressors (IRS), Teaching and Learning Related Stressors (TLRS), Social Related Stressors (SRS), Drive and Desire Related Stressors (DRS), Group Activities Related Stressors (GARS).

Objective : To assess the gender difference in the level of stress experienced among the medical students.

Materials and methods : Cross-sectional study was designed and 150 medical students (72 male, 78 female, age 18-24 years) were recruited after obtaining written informed consent. Stress was assessed using MSSQ under six domains. Students were instructed to respond to the 40 items as 0, 1, 2, 3 and 4 according to the intensity of stress experienced. The students were categorized into mild, moderate, high and severe depending on their response. The percentage distribution of 4 categories and the level of stress were compared between male and female students.

Results : A significant difference exists in the percentage distribution of mild, moderate high and severe categories between female and male students with respect to ARS, IRS and TLRS domains. Also, the intensity of stress related to ARS, IRS and TLRS domains was high among female students. There was no gender difference in SRS, DRS and GARS domains.

Conclusion : Female medical students experience higher stress than male students especially in academic related stressor, interpersonal stressor, and teaching learning stressor domains.

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RESEARCH POSTER ABSTRACTS

Poster 1 (P1). Central Nervous System

P/ CNS/1

Common trigger factors of Migraine

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Background : Migraine is one of the common neurological disorders associated with unilateral episodic headache with or without aura. Migraine is mainly diagnosed by clinical history. Most of the time headache is induced by some common factors to which migraine patients are hypersensitive. These triggers are specific to patients.

Objective : To find out the common trigger factors for migraine.

Materials and methods : After obtaining the institutional ethical clearance migraine patients attending a tertiary care were recruited for the study. Patients having history of migraine for minimum two years with headache frequency 2 to 15 per month were included in the study. Patients were asked to write diary daily for one month. Trigger factors were noted after taking the details history and by seeing the migraine diary.

Results : Common trigger factors for migraine patients in our study are missing meals, skipping / decreased duration of sleep, strong odour.

Conclusion : For the migraine patients, it is very important to know the common trigger factors which can be identified by close observation and by maintaining the headache diary. This will help them to avoid these trigger factors and reduce the frequency of headache. These triggers factors will also give the insight for the pathophysiology of migraine.

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P/ CNS/2

Assessment of Visual Reaction time in Shift Duty Drivers of Rajasthan Roadways

SHEFALY CHAUDHURY, KEERTI MATHUR,
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BHAVYA MATHUR

Background : Reaction time (RT) is an index of the processing ability of central nervous system and is a simple means of determining sensory-motor associations and performance of an individual. How quickly a person responds to a stimulus depends on his reaction time thus it determines the alertness of a person, which is a prerequisite in certain occupations like driving.

Objective: To find out the effects of shift working i.e. influence of night duty as compared to day duty on Visual reaction time in bus drivers.

Material and Methods: Three groups were formed: Group 1: 50 healthy controls, Group 2: 25 day duty workers and Group 3: 25 night duty drivers. Visual reaction time in each group was assessed by using visual Reaction Time apparatus. Mean \pm SD values for red and green visual reaction time was assessed. Data were analyzed using one way ANOVA with post-hoc Tukey HSD test.

Results: Visual reaction time shows a significant ($p < 0.001$) difference among the groups for red and green color. On post-hoc analysis night duty workers has significantly higher visual reaction time for red and green colors as compared to day duty and control subjects.

Conclusion: The present study showed that the night duty drivers have a delayed visual response. This may be because of fatigue thus the drivers should have adequate sleep before going to their night shifts and there should be provision of duty break.

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P/ CNS/3

Visuospatial working memory in Schizophrenia

SUNAINA SONI MAMTA SOOD, SIMRAN KAUR,
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Background : Impairments in working memory are a core cognitive deficit in schizophrenia which also reflects genetic liability to the disorder and may serve as an endophenotypic marker.

Objective : To study the effect of increasing visuospatial working memory load using a task involving simultaneous maintenance, manipulation, retrieval and recoding of encoded information in patients with schizophrenia, their first degree relatives and healthy controls.

Materials and methods: Eleven patients with schizophrenia (DSM-5 criteria, age range- 18 to 45 years), 11 first degree relatives of patients and 11 age, sex and education matched healthy controls encoded abstract pictures (Load I- 3 pairs, Load II- 6 pairs, Load III- 8 pairs) for 10 seconds and then matched all pairs of abstract pictures correctly to complete the load. Outcome measure: (i) Number of error trials for load I, II and III (ii) Total error trials

Results : Error trials in load I, II and total error trials showed statistically significant difference between groups [ANOVA, $F(2,30) = 3.421, 5.349, 4.714$; $p = 0.046, 0.010, 0.017$ respectively] at $p < 0.05$. Post hoc comparison revealed that for load I, patients committed significantly more errors compared to first degree relatives ($p = 0.045$). For load II, patients committed significantly more errors compared to healthy controls ($p = 0.011$). No significant difference was found between groups for load III. Patients committed significantly more total errors compared to both healthy controls ($p = 0.027$) and first degree relatives ($p = 0.039$).

Conclusion : Patients with schizophrenia exhibited reduced performance on visuospatial working memory task. Impairment in visuospatial working memory in first degree relatives may not be evident at the behavioural level.

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P/ CNS/4

To assess the Autonomic Dysfunction in Idiopathic Parkinson's disease

SANJAY DHIMAN, ANITA PADAM YUVRAJ

Background : Autonomic dysfunctions are common features of Parkinson's disease. It has been estimated that

over the course of Parkinson's disease, more than 90% of patients experience symptoms of autonomic dysfunction, which have negative impact on the quality of life.

Objective : To assess the autonomic Dysfunction in Idiopathic Parkinson's disease.

Materials and methods : To assess the parasympathetic dysfunction, heart rate variability at rest, heart rate variability in response to deep breathing and valsalva manoeuvre and to assess the sympathetic dysfunction, blood pressure change in response to change in posture and sustained hand grip test were performed in age and sex matched thirty five patients and thirty five controls.

Results : Valsalva ratio was significantly lower in idiopathic Parkinson's disease patients as compared to controls ($p = 0.036$). In orthostatic test, significant fall in systolic blood pressure on standing from supine posture in idiopathic Parkinson's disease patients as compared to controls ($p = 0.001$). In heart rate variability at rest using spectral analysis, high frequency was significantly lower in patients than controls ($p = 0.03$).

Conclusion : Autonomic dysfunction is more common in patients of idiopathic Parkinson's disease as compared to controls. In the present study, the parasympathetic insufficiency is more marked, as significant decrease has been found both in Valsalva Ratio and High Frequency Component of Heart Rate Variability Test. Sympathetic insufficiency has also been found in idiopathic Parkinson's disease patients as there is significant fall in systolic blood pressure in response to change in posture from supine to standing.

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P/ CNS/5

Cross modal plasticity in congenitally deaf using Evoked Potential studies

ADITYA KOPPULA, CH.N.RAJKUMARI

Background: Congenital deafness afflicts more than 3 in 1000 live births in developed countries. Its causes include Genetic defects, Infections, drug exposure in utero etc.,. It affects child's linguistic, social and cognitive abilities. Cross modal neuroplasticity tends to compensate for the loss with gain in other perceptual modalities.

Objective: To study cross modal compensation in congenital deafness by EVOKED POTENTIAL STUDIES.

Material and Methods: Appropriately matched ,Male , congenitally deaf student(n=40) study group,normal spoken student(n=40) control group were selected and subjected for VISUAL(VEPs) and SOMATOSENSORY EVOKED POTENTIAL STUDIES(SSEPs) .The recorded parameters were P100, N20/P25 absolute latencies and

N9N20, N13N20, N9N13 interpeak latencies. Statistical analysis was done by independent sample t-test using PSPP software.

Results: A statistically significant difference was found between the two groups for N9N13 interpeak latency. Other parameters were not found to be significant.

Conclusion: Short latency SEP(N9N13) showing significance difference is consistent with plasticity at the subcortical level. As every ascending sensory system has a descending control system, this decrease reflects facilitation at the subcortical level as a consequence of cortical reorganization in response to congenital auditory deprivation.

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P/ CNS/6

Valence Specific Changes in Theta Power during Processing of High Arousing Emotional Stimuli

NISHI PEGWAL, RAJKUMAR YADAV, ASHIMA NEHRA, RATNA SHARMA

Background : Theta rhythms have long been associated with the components of limbic system and hence found to be higher during emotional experiences. But there is no consensus amongst different studies on how these rhythms behave when exposed to high arousing emotional stimuli of different valence.

Objective : The current study was conducted to understand the changes in total theta band power in response to high arousing stimuli of different emotional significance.

Materials and methods : High arousing negative and positive and low arousing neutral IAPS pictures were used to induce emotions in 33 subjects (both male and female). EEG was recorded using high-density EEG sensor net (128-electrode) during emotional picture viewing. EEG signals were then pre-processed in Netstation and EEGLAB. Total power in theta frequency band was calculated using Fast Fourier Transform during baseline eyes open condition and the picture viewing condition on Matlab platform. Conditions were compared using wilcoxon rank-sum test ($p < 0.05$).

Results : High arousing emotional stimuli showed significantly higher total theta power when compared to their baseline eyes open condition than the neutral stimuli. Also the negative picture viewing state showed higher theta power in anterior leads while positive emotions induced higher theta power in posterior leads.

Conclusion : Theta band shows valence and arousal specific changes with more total power in anterior brain

regions for negative emotions and more total power in posterior brain regions for positive emotions when compared to their respective baseline conditions.

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P/ CNS/7

Cognitive Effects of GLP-1 Modulators in Rodent Models

LALIT KUMAR GUPTA, MAYUR KAMBLE, HARMEET SINGH REHAN

Background: Evidence supports a neurotrophic and neuroprotective role of GLP-1 receptor stimulation.

Objective: To evaluate the effect of liraglutide (a long-acting GLP-1 agonist) and sitagliptin (a DPP-4 inhibitor) on the cognitive behavior in rats or mice.

Material and Methods: Cognition was assessed by measuring the transfer latency in elevated plus maze (EPM) and escape latency in Morris water maze (MWM). Memory deficit was induced by pentylenetetrazole (PTZ) or scopolamine. In EPM, liraglutide and sitagliptin were administered daily over the six days. In MWM, sitagliptin and liraglutide were administered daily for 4 days, 30 min before scopolamine to assess their effect on learning and memory.

Results: In EPM test, administration of liraglutide 100 $\mu\text{g}/\text{kg}$ and 200 $\mu\text{g}/\text{kg}$ and sitagliptin 3 mg/kg and 6 mg/kg decreased the transfer latency as compared to PTZ alone. In MWM administration of liraglutide 200 $\mu\text{g}/\text{kg}$ and sitagliptin 6 mg/kg prevented the scopolamine-induced increase of the escape latency on day 4, indicating amelioration of scopolamine-induced impairment of acquisition.

Conclusion: Both liraglutide and sitagliptin produced cognitive improvement in the animal models.

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P/ CNS/8

VEPs in Diabetes Mellitus type 2

MYTHILI CHALLA INDIRA, RAJKUMARI

Background: Diabetic retinopathy is a common complication of DM that affects retinal blood vessels. One of the primary goals of management in diabetic patients is to avoid the risk of diabetic retinopathy by maintaining blood glucose levels close to the normal range. Before the onset of microvascular lesions, the retina in diabetics undergoes subtle functional changes that are not detectable

by fundus photography. Analysis of pattern VEP responses may provide early diagnosis of such diabetic changes .Pattern VEP (PVEP) can detect any defect from the optic nerve to the occipital cortex

Objective: To evaluate cortical and retinal activity by pattern visual evoked potentials (PVEP) in patients with type II diabetes mellitus.

Material and Methods: PVEPs recorded in 30 Diabetic patients without any retinopathy and compared to 30 age and sex matched normal Controls using Viking select

Results: P100 wave latency is significantly longer ($p < 0.01$) in diabetic Patients as compared to normal Controls

Conclusion: Increased PVEP latency before the appearance of the first ophthalmoscopically detectable signs of diabetic retinopathy indicate neuronal dysfunction involving visual pathway. PVEP may be considered as a method for detecting onset of diabetic retinopathy

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P/ CNS/9

The Role of Sleep in the Consolidation Conditioned Memory

SUSHIL JHA

Background It still remains an enigma that "Why do we sleep?" • It is believed that the different sleeping stages such as Non-Rapid Eye Movement (NREM) sleep and REM (Rapid Eye Movement) sleep, possibly, together or individually, provide optimal conditions for the consolidation of certain learning tasks. For example, improvement in the visual texture discrimination task correlates with the levels of both the sleep states: REM and NREM sleep, while improvement in the motor sequence task and the motor adaptation task correlates with NREM sleep only. However, the role of sleep in the consolidation of several other types of memory such as associative memory is not clearly known.

Objective: "After a series of experiments, we have recently observed that the consolidation of associative memory is also sleep-dependent and requires augmented sleep. Further, we have observed that the changes in sleep architecture are an explicitly consolidation dependent phenomenon. In addition, we have found that both sleep deprivation along with alteration in the circadian timing contribute at larger scale in impairing consolidation of associative memories. Further, our results suggest that sleeping brain possibly helps activate the underlying protein synthesis/gene expression machinery during sleep.

In addition, sleep is thought to consolidate changes in synaptic strength, but the underlying mechanisms are

unknown. We investigated the cellular events involved in this process during ocular dominance plasticity (ODP) " a canonical form of in vivo cortical plasticity triggered by monocular deprivation (MD) and consolidated by sleep via undetermined, activity-dependent mechanisms. We find that sleep consolidates ODP primarily by strengthening cortical responses to non-deprived eye stimulation. Consolidation is inhibited by reversible, intracortical antagonism of NMDA receptors (NMDARs) or cAMP-dependent protein kinase (PKA) during post-MD sleep. Consolidation is also associated with sleep-dependent increases in the activity of remodeling neurons and in the phosphorylation of proteins required for potentiation of glutamatergic synapses. These findings demonstrate that synaptic strengthening via NMDAR and PKA activity is a key step in sleep-dependent consolidation of ODP"

Our results suggest that sleep plays an instructive role in the consolidation of associative memory and neuronal plasticity.

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P/ CNS/10

A Comparative Study of Audiovisual Reaction Time between Urban and Rural Children in the Age Group of 11-16 years.

NARHARI P POPHALI,
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Background : Reaction time is the interval between onset of a signal(stimulus) and the initiation of a movement response. Degree of physical fitness and various other factors can affect reaction time in urban and rural children. The purpose of the study is to compare audiovisual reaction time among them.

Objective: 1.To measure simple reaction time in urban and rural children.

2.To compare simple reaction time in urban and rural children.

Materials and methods : Our study included 11-16years of school going children, 60 from urban and 60 from rural school. Their height and weight were recorded and BMI was calculated. The simple reaction time was measured using audio visual reaction time apparatus and data was compared between urban and rural children. Students "t" test was used for the analysis of data.

Results : The "p" value was found to be statistically significant ($p < 0.05$) for auditory and visual reaction times. The reaction time of rural school going children was found better than urban school going children.

Conclusion : In this study, the audiovisual simple reaction time of rural school going children was found to be

significantly better than that of urban children of the same age group. More physical activity and less sedentary life styles probably be the reason for better reaction time in rural children as compared to urban children.

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P/ CNS/11

Previous exposure to maternal separation stress impairs cued fear extinction and differential fear conditioning in rats

**PRADEEP KUMAR MISHRA, BINDU M KUTTY,
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Background: Experiencing early-life stress has been considered as a real risk factor for the development of many of brain disorders like PTSD.

Objective: Delayed fear extinction with enhanced fear is hallmark of anxiety disorders. The aim of the present study is to investigate the effects of long-term impact of 10-days of maternal separation stress on the fear memory and fear extinction in male Wistar rats.

Material and Methods: Rats were subjected to maternal separation and isolation stress (MS) during the Stress Hypo Responsive Period (SHRP) (P4-P14) (6 hours daily for 10 days). Two months later, these rats were subjected to cued fear conditioning session. 24 hours after fear conditioning, both normal control and MS groups received six extinction training sessions (20 tone-alone presentations). An extinction test session was carried out after 10 days of extinction training. Single- units were simultaneously recorded in rats from neurons in IL division of medial prefrontal cortex (mPFC). Comparative changes in the distribution and density of the nuclear staining (HDAC immune- reactive cells) were observed in IL in both NC and MS rats.

Results: Percent freezing and spike activity of ILC neurons were assessed during all phases of fear conditioning. MS stress did not impair the fear acquisition, but significantly increased the fear memory when compared to normal controls. MS stress also impaired cued fear extinction memory having recovery of early and late extinction fear memory. In addition to behaviour findings, MS stress showed increase in tone evoked responses in IL neurons during early extinction training and these responses decreased in magnitude over the course of extinction training as compared to NC rats. Alteration in number of both regular and tone evoked neuronal activity in the IL may show deficit in immediate fear extinction. Baseline expression of HDAC 2 immuno-reactive cells were increased in MS group may indicate the same.

Conclusion: The behaviour, electrophysiological and epigenetic findings showed deficit in fear extinction and increased fear memory retention in MS rats suggest that

MS stress may be responsible for the anxiety disorders in adulthood.

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P/ CNS/12

Do the Congenitally Blind Individuals have better Haptic perception than Blindfolded sighted Individuals

**BHAVANA BHIRUD LALITACHANDAN,
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Background : Haptic perceptual enhancement in congenitally blind people is a subject of intense debate. There is no consensus whether the congenitally blind get the benefit of their haptic experience or the sighted get the benefit of previous visual experience when it comes to recognizing objects by manual exploration. The present study compared haptic object perception between congenitally blind and blindfolded sighted participants in a situation where manual exploration of objects was constrained.

Objectives : Aim of our study is to compare haptic object perception between congenitally blind and sighted participants. And to investigate the role of visual experience on haptic recognition of objects by congenitally blind and sighted participants.

Material and Methods : Thirty congenitally blind braille readers of 30 yrs of age and gender matched controls were studied. All participants were required to identify the objects haptically, without the aid of vision. Manual exploration of the objects was constrained by permitting touching of the object with only the exposed tip of the index finger with the aim to limit cues about material information. Performance was evaluated in terms of speed and accuracy with which objects were identified.

Results : The recognition time analysis showed that congenitally blind participants recognize objects much faster than blindfolded sighted participants. The analysis of haptic recognition rates showed that congenitally blind participants identified the objects more accurately compared to blindfolded normal sighted individuals.

Conclusion : Congenitally blind individuals appear to possess a definite enhanced haptic perceptual ability allowing for faster and more accurate recognition of objects even when manual exploration is constrained.

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P/ CNS/13

Visual Evoked Potential (VEP) as a marker for CNS dysfunction in hypothyroid patients

APRAJITA SHARMA G, AGGARWAL S, SOOD S

Background: Hypothyroidism affects the CNS through its role in gene expression, myelin production, axonal transportation and neurotransmitters. As myelination is affected there is delay in conduction of impulses resulting in abnormal VEP.

Objective: To compare the VEP of newly diagnosed treatment naive hypothyroid patients with healthy controls and to find its correlation with TSH level.

Method: VEP was measured using RMS EMG EP MK2 machine in 30 patients (serum TSH ≥ 10 mIU/L) and 30 healthy controls between 18 – 50 years of age.

Result: The mean age in years (\pm S.D.) of patients and healthy controls were 31.7(\pm 8.3) and 32.9(\pm 7.6). There were 28 female hypothyroid patients. Serum TSH (mIU/L) range was (10.35 – 500) and mean (\pm S.D.) was 81(\pm 121.5). The VEP showed a triphasic response (N75, P100, N145) with increased mean latency and decreased mean amplitude in hypothyroid patients. Right eye (patients versus controls) N75 msec (74.6 \pm 9.1 vs. 70.3 \pm 8; 'p' 0.02); P100msec (110.7 \pm 7.7 vs. 101.1 \pm 6.5; 'p' <0.0001); N145msec (156 \pm 16.3 vs. 151.8 \pm 10.7; 'p' 0.12); P100-N75 mV (3.1 \pm 1.7 vs. 3.8 \pm 1.7; 'p' 0.05). Left eye N75 (75.3 \pm 7.3 vs. 71.5 \pm 7.7; 'p' 0.02); P100 (110 \pm 7 vs. 103.2 \pm 9.5; 'p' 0.001); N145 (157.4 \pm 13.9 vs. 154.4 \pm 14.2; 'p' 0.2); P100-N75 mV (3.3 \pm 2.2 vs. 4.1 \pm 1.8; 'p' 0.07). Serum TSH did not show good correlation with measured VEP parameters.

Conclusion: VEP is a non invasive and sensitive method to detect subtle early changes in the CNS and in follow up of these patients to assess the response to treatment in correlation with the clinical improvement.

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P/ CNS/14

Effect of TRPV1 channel antagonist microinjection in preoptic area on brain and body temperature in rats

RAJESH YADAV, HRUDA NANDA MALLICK,
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Objective : To study the effect of microinjection of transient receptor potential vanilloid (TRPV1) channel antagonist in the preoptic area on brain and body temperature in awake rats.

Materials and methods : The study was conducted in 6 male Wistar rats. Under thiopentone sodium anesthesia (40 mg/kg BW) a bilateral guide cannula (24G) with indwelling styli was implanted with their tips aimed at 2 mm above the preoptic area (POA) as per De Groot's atlas. A radio transmitter TA10TAF-40 (Data Science International, USA) for the telemetric recording of body temperature (Tb) was implanted in the abdomen. A K- type thermocouple wire was inserted near the hypothalamus to measure the brain temperature (Tbr). Tbr was recorded at 15 second interval through a fluke digital thermometer. Tb was recorded telemetrically at 15 second interval. The temperature was measured from 10.00 to 16.00 h and injection was given at 12.00 h. Temperature data was averaged at 15 minute epochs. TRPV1 antagonist, JNJ17023212 (Sigma-Aldrich) (0.4 μ g/0.2 μ l) injection was given bilaterally at the POA at a rate of 0.1 μ l/min using an injector cannula. The site of injection was confirmed histologically. The statistical comparison was made between pre and post injection record using repeated measure Anova and time matched control with injection was compared with wilcoxon signed rank test.

Results : Body temperature recorded in six rats range between 37.46 \pm 0.27 $^{\circ}$ C - 37.92 \pm 0.4 $^{\circ}$ C and brain temperature 36.22 \pm 0.18 $^{\circ}$ C - 37.45 \pm 0.39 $^{\circ}$ C. The injection of TRPV1 antagonist (0.4 μ g/0.2 μ l) into preoptic area produced significant increase in body and brain temperature. After the microinjection of TRPV1 antagonist, JNJ17023212 (0.4 μ g/0.2 μ l), there were significant increase Tb during 12.30 to 1.15PM and Tbr during 12.15 to 2PM. The magnitude of maximum increase Tb was about 0.8 $^{\circ}$ C and Tbr about 0.7 $^{\circ}$ C. It was observed around 45 minutes for Tb and 1h for Tbr after the drug injection. The Tb and Tbr during this period were 38.4 \pm 0.2 $^{\circ}$ C and 37.1 \pm 0.2 $^{\circ}$ C. The Tb and Tbr did not return to its baseline value around till 4PM and its value was (38.6 \pm 0.4) $^{\circ}$ C and (36.4 \pm 0.1) $^{\circ}$ C.

Conclusion : The injection of TRPV1 antagonist, JNJ17023212 (0.4 μ g/0.2 μ l) into preoptic area produced significant increase in body and brain temperature in rats.

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P/ CNS/15

To study the taste sensitivity to Phenylthiocarbamide (PTC) in smokers & non-smokers in Indian population.

PRANALI BHANDARE, MANISH DHADSE

Background : Phenylthiocarbamide (PTC) is a chemical compound that has a bitter taste to most people, but some cannot taste it. The ability to taste PTC is inherited, and appears to depend on a pair of genes. Individuals having

the recessive gene homozygous are non-tasters, therefore the ability to taste PTC is a dominant trait. We hypothesized that individuals who, in a simple taste test, perceive phenylthiocarbamide (PTC) as bitter may find the taste of cigarettes aversively bitter and could therefore have a reduced vulnerability to nicotine addiction compared to non-taster, who would be the group at greater risk of addiction. There is a bimodal distribution for PTC taste threshold: Low thresholds are classified as tasters High thresholds as non-taster.

Objectives : To study the taste sensitivity to Phenylthiocarbamide (PTC) in smokers & non-smokers in Indian population.

Material and Methods : Harris & Kalmus method as described below using PTC solution different concentration.

Sample size: 122 participants were included in this study from 18 to 45 years of age group.

Results Statistically significant result was obtained between smokers and non-smokers with p value less than 0.05.

Conclusion : The purpose of this study was to identify adults who are most vulnerable to nicotine addiction. This will help us in early detection and taking preventive measures for nicotine addiction

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P/ CNS/16

Effect of Body mass index on cognition in children aged 5 to 6 years

SHEETAL C N, VEENA UMESH B

Background : Growth and development is one phenomenon that is peculiar in the pediatric age group. The fetal environment, birth weight, and subsequent growth are all affected by a number of environmental factors that influence the quality of life, including the cognition, and these may persist into adulthood.

Objectives :

"1. To assess the cognitive functions of children at 5 to 6 years of age by performing a battery of cognitive function tests.

2. To compare the cognitive performances of children based on their BMI

Material and Methods : Seventy children aged 5 to 6 years were selected from different private schools, of whom twenty three were identified as undernourished and forty seven as adequately nourished, based on their height and weight measured. NIMHANS neuropsychological

battery for children was used to assess motor speed, attention, memory, speech and visuospatial function. Temperament was assessed by the teacher of each child.

Results : Undernourished children scored lower in parameters of speech (P=0.001) and memory i.e reverse digit span(P=0.009) and the difference was statistically significant

Conclusion : BMI has a influence on the cognition of the child .

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P/ CNS/17

Effect of metformin in experimentally induced Alzheimer's disease in Wistar rats

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Background: Alzheimer's disease (AD) is a neurodegenerative disorder. Pathological hallmarks of AD are accumulation of amyloid beta, hyperphosphorylation of tau proteins and neuronal loss. Accumulated proteins form senile plaques leading to synaptic dysfunction, neuronal degeneration and cognitive impairment. The prevalence of AD is increasing worldwide.

Objective : To evaluate the effects of metformin on experimentally induced Alzheimer's disease in Wistar rats.

Materials and methods : Animals were randomly divided into 4 groups- control, disease model, disease model treated with standard drug rivastigmine and disease model treated with test drug metformin. AD was induced by oral aluminium chloride (17/mg/kg body weight) for a period of 4 weeks. Control group was left untreated. Test group and standard groups were treated with metformin and rivastigmine respectively for 4 weeks. At the end of 4 weeks, passive avoidance test was performed and animals were sacrificed to estimate the levels of brain acetylcholinesterase. Data was analysed by one way ANOVA using SPSS.

Results : The result of the present study showed that disease model treated with metformin showed a statistically significant improvement in learning & memory and there was an increase in acetylcholinesterase activity when compared to disease model group (p<0.05).

Conclusion : Metformin attenuates learning and memory dysfunction in aluminium chloride induced AD in Wistar rats. However, further research in this area will throw a light on the effectiveness of metformin in AD.

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Expression of IL-2 and TNF- α in the hippocampus of male wistar rat in adverse physiological conditions- A pilot study

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Background : IL-2 and TNF- α potentially produced by neurons are associated with hippocampus development and regulation. Benzo[α]Pyrene (B[a]P) one of the potent carcinogen causes physiological changes in the hippocampus leading to memory dysfunction and immune suppression of CNS. The real mechanism behind the effect of B[a]P on cytokine production in the hippocampus is unclear. Therefore, we have done preliminary studies using Dimethylsulfoxide (DMSO).

Objectives : To study the expression of cytokines in the hippocampus of DMSO and B[a]P treated rats.

Materials and Methods : Multiple sequence alignment tool CLUSTAL Ω (1.2.0 version) was used to analyze IL-2 and TNF- α protein sequences of rat and human obtained from PUBMED database. Administration was done intrathecally in the five days old male wistar rats and sacrificed on 28 post-natal days. Vibratome sections of rat brain (40 microns) were immunohistochemically stained with 3, 3'-Diaminobenzidine. Western blot was also carried out.

Results : Homology of IL-2 and TNF- α between rat and human were determined to be 66% and 76%, respectively. No cytokine expression was observed in the hippocampus of control and DMSO treated rats unlike the B[a]P treated ones.

Conclusion : The conserved pattern of IL-2 and TNF- α between rat and human provides an insight towards the development of immunotherapy in tumor patients associated with loss of memory. Both the cytokines are of immense use in the consolidation of memory response in hippocampus. In particular, expression of these cytokines in the hippocampus of B[a]P treated rats can serve as important biomarkers linked to immune activation in carcinogenic conditions along with memory loss.

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Autonomic Function Tests in female migraine patients during headache free period : a case- control study

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KAPIL DEV MATHUR**

Background : Migraine is the 3rd most prevalent and 7th leading cause of disability worldwide. It is a chronic neurological disorder that has diverse autonomic manifestations. Yet, there are less conclusive studies available regarding dysfunctions of the autonomic nervous system in migraineurs during headache free periods.

Objective : To assess and compare the autonomic function tests in female migraine patients during headache free period and age matched healthy female controls.

Material and Methods : Forty diagnosed female migraine patients age ranging between 30-40years, fulfilling the criterias of ICHD 2004 formed the study group. Age matched 40 healthy female subjects froms SMS Medical College were taken as control. For Sympathetic function tests:- Postural B.P. change, sustained handgrip test. For Parasympathetic function tests: 30:15 R-R ratio, Heart rate response to Deep breathing were performed . Statistical analysis was performed using SPSS software version 20 and unpaired student t-test to derive the level of significance.

Results : Mean 30:15 R-R ratio and mean maximum-minimum Heart Rate in Deep breathing was significantly lower in study group as compared to controls (p-value<0.001). Postural Systolic Blood Pressure change and Diastolic Blood Pressure change with Sustained handgrip was significant different in migraine patients (p-value <0.001) during headache free period compared to controls.

Conclusion : Migraineurs during headache-free periods are found to have sympathetic hyperactivity. Therefore, an early understanding of the autonomic nervous system dysfunctions in migraine patients can help in diagnosis, prevention and treatment.

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The effects of cognitive, visual and auditory distractions on audiovisual reaction time in MBBS students of GMC Aurangabad, a cross-sectional study.

**BEULAH RAINER, PRATIBHA DESHMUKH,
SYEDA AFROZ**

Background : In our fast pace world, the speed and accuracy with which we respond to a situation, despite various distractions is essential for our everyday activities like driving, sports, industrial work, security services, etc.

Objectives : So we have undertaken to study the effect of cognitive, visual and auditory distractions on audiovisual reaction time (AVRT) in young males and females.

Material and Methods : Choice AVRT of MBBS students of the age group of 18-25years was measured using an AVRT machine in a controlled setting. After history & general examination, two different colors were randomly presented to measure visual reaction time & two different sounds for auditory reaction time. Subjects were made to count aloud in a reverse order for cognitive-speech distraction, see a PPT slideshow for visual distraction and listen to music for auditory distraction. Minimum reaction time for red color & high frequency sound was taken.

Results : Auditory & visual reaction times in both males and females were significantly different for cognitive, visual and auditory distractions.

Conclusion : Distractions significantly prolong the audiovisual reaction time; so they should be avoided especially during activities requiring attention, precision, quickness & coordination.

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P/ CNS/21

A Study of Visual And Auditory Reaction Time with Dual Tasking

**MANISHA SOOD, R R DESHPANDE,
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Background : Reaction time involves stimulus processing, decision making and response programming and is found to be altered by a number of factors both physiological and pharmacological. In current times multitasking like talking on the phone while driving, cooking etc. has become a common scenario. In such a situation, the present study was designed to compare the differences in auditory and visual reaction times, between both the sexes, with and without dual tasking; and find their ability to handle the "dual task" of simultaneously talking on cellphone and performing the test on the ART (Audiovisual Reaction Time) machine

Objective : To find the effect of concurrent mobile use on Visual and Auditory Reaction Time

Material and Methods : The study is being carried out on 50 healthy females and males between age group of 20-40 years (after proper general and systemic examination). Their Visual and Auditory reaction time are being measured using the auditory and visual reaction time machine. Average of three readings will be taken. Auditory reaction time and Visual reaction time is also being taken while conversing on the mobile using the hand held mode and with hands free mode. Data collection is ongoing

Results : As the data collection is ongoing ,the results will be obtained after compilation of data and appropriate stastical analysis.

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P/ CNS/22

Change of astigmatism with aging

**CHITRA KUMAR, ARUP BANERJEE, K C RAY, K
KUMAR, S DE**

Background : In regular astigmatism, a condition where the two principal meridians of cornea have different radii of curvature, the axes of required refractive correction are reported to change linearly with age in most individuals. Children and young adults commonly have WTR(With The Rule astigmatism, requiring negative cylindrical correction within 70-110 degrees) while elderly people commonly have ATR (Against The Rule astigmatism, requiring negative cylindrical correction between 161-180 & 1-20 degrees).Though majority of the studies published so far have supported this view, there also have been a few contradictions.

Objective : A clinical survey on a randomised cross-sectional astigmatic population to detect and determine the types of astigmatism present, to determine their relationship with advancement of age and to corroborate the findings with their established physiological explanations.

Materials and methods : The study was performed upon eyes of 1300 astigmatic individuals of Kishanganj, Bihar, divided in 13 age groups . Corneal curvatures were measured with keratometer while axes of astigmatism were determined with auto-refractometer and streak retinoscope. Results obtained therefrom were analysed using Microsoft Excel.

Results : Upto the age of 15 years majority of the astigmatisms are WTR(about 64%).

In 16-25 years age group the incidences of WTR, Oblique and ATR astigmatism are almost equal (about 34%,36%and 30% respectively).

In 26-40 years age group Oblique astigmatism is predominant (about 48%).

Above the age of 40 years ATR is the commonest type of astigmatism(about 55%).

Conclusion: In majority of population with progression of age, With The Rule astigmatism physiologically progresses to Against The Rule astigmatism almost linearly.

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P/ CNS/23

Nerve conduction: a comparative study in males and females of Haryana

ASHISH ARVIND, VISHAL GOEL, SUSHMA SOOD

Background : Nerve conduction studies have become an important non invasive tool for diagnosis of nerve lesions. Among the various factors affecting nerve conduction, gender may have a significant role. This study was planned to study the effect of gender on various parameters of nerve conduction.

Objective : To compare the nerve conduction velocity in males and females.

Materials and methods : Nerve conduction study data of 30 males and female subject was obtained retrospectively from the lab records and analyzed. Nerve conduction properties were evaluated for median and ulnar nerve on both the sides by using standard techniques of supramaximal percutaneous stimulation with a constant current stimulator and surface recording electrode for both nerves of each subject.

Results : The motor nerve conduction studies for median and ulnar nerve revealed a statistically significant difference in distal motor latency and amplitude in ulnar nerve on both the sides. The amplitude was non-significantly higher in females than males in both the limbs for both the nerves. Difference in conduction velocity for both the nerves on either side was obvious but not statistically significant. It was higher in females than in males.

Conclusion : The difference in nerve conduction parameters was observed in males and females and hence it is important to consider this difference before diagnosing any lesion based on electrophysiological studies.

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P/ CNS/24

Restoration of Motor Skills after Constraint Induced Movement Therapy (CIMT) in Ischemic Stroke Rats

NESIN MATHEW, SABITHA K. RAJESH, ANUPAM GUPTA, LAXMI T RAO

Background : Stroke is the leading cause of adult disability and Rehabilitation is the only method to regain the lost functional connectivity. Constraint Induced Movement Therapy (CIMT) is identified to be well effective in regaining the functional activity of paretic upper arm even in chronic stroke cases.

Objectives : Our study aimed to understand the extent to which CIMT helps the motor recovery with minimum compensatory mechanisms in rat model of ischemic stroke.

Material and methods : Endothelin-1(ET-1) was microinjected intracortically in Sprague Dawley male rat to develop the ischemic stroke. CIMT was applied for 1 week starting from 5th day after inducing ischemia. After 2 days of recovery from CIMT, motor performance was tested for 3 days. To confirm the infarct size, 2,3,5-Triphenyltetrazolium chloride(TTC) staining was carried out. The behavioral validation of stroke and recovery from stroke was done using gait analysis, cylinder test, grid walking and reach to grasp test.

Results : Intracortically administered ET-1 induced ischemic stroke model was confirmed by the infarct in the sensorymotor cortex in TTC stained brain slices. Gait analysis show a significant decrease in stride length ($P<0.0001$, $n=9$) after stroke. The ipsilateral bias observed in cylinder test after stroke was significant ($n=7$) but did not show complete recovery with CIMT. However, CIMT was beneficial in increasing success percentage to reach ($P<0.001$) and the quality of reach to grasp task compared to the non-treated group. CIMT also helped to reduce the use of compensatory mechanisms which is a usual condition associated with stroke

Conclusion : In the present study, we tried to demonstrate the validation of ischemic stroke in rats using different behavioural tests and effect of CIMT on the functional motor recovery after ischemic stroke.

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P/ CNS/25

Effect of different frequencies on ART during performing dual task

ISHAAN KALAVATIA, MANJINDER KAUR, NAREN KURMI

Background : Previous studies have shown that ART increases during performing dual task. But high pitch sound is associated with faster response. Attention switching is the key factor associated with the quick response.

Objectives : To evaluate the effect of different frequencies (250 Hz, 500Hz, 750 Hz) on the ART in normal subjects during performing dual task.

Material and methods : 82 normal young subjects were recruited from general population. Audio visual reaction time machine , RTM-608 (Medicaid Systems, Chandigarh) was used for the estimation of ART estimation for 250, 500 & 750 Hz frequencies. Their baseline ART scores for these three frequencies were noted. Then again same examination was repeated while the subjects were talking

on the mobile phone (dual task). ANOVA & Post Hoc Tukey test were performed to compare the means.

Results : There was significant increase in response time for all the three frequencies as compare to their respective baseline scores. P values for 250 Hz, 500 Hz & 750 Hz were .004, .000 & .001 respectively. But there were no significant differences (P= .256) among the ART for these frequencies while performing the dual task.

Conclusion : Dual task increases the ART. But this increase in ART is not significantly affected by difference in the pitch of auditory stimuli.

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P/ CNS/26

Impact of Dynamic mutation (GAA expansion) in altered physiology of Friedreich's ataxia patients

SRINIVASAN MUTHUSWAMY, SARITA AGARWAL

Friedreich ataxia is an autosomal recessive, neurodegenerative disease caused by dynamic expansion of GAA triplet repeat at first intron of FXN gen. These expanded GAA repeats disturbs frataxin production. Frataxin is an important Fe-S clustering protein. Lack of frataxin causes deficient Fe-S cluster and as a result iron import increases. Under excess iron availability, it favors fenton reaction generating free radicles owing to imbalance in oxidant and antioxidant system disturbing the physiology of system. This results in neuronal degeneration, Iron deposition in cardiomyocytes leading to hypertrophic cardiomyopathy.

Materials and Methods : Clinically suspected cases of FA were diagnosed by molecular methods and included in the study (20 no.) along with controls (50 no.) after obtaining informed consent. Two ml of vein puncture blood was collected in EDTA vial and used for DNA extraction, lymphocytes isolation and antioxidant enzymes estimation. We did long range PCR to estimate the GAA repeat size. The antioxidant enzyme levels were measured by colorimetic method (Cayman Chemical Kit, USA).

Results : FA patients showed a non-significant increase in SOD activities (4.32 ± 2.5346 Vs 3.50 ± 1.8662 U/ml); glutathione peroxidase values (1.3 ± 0.64 vs 0.97 ± 0.54 U/ml) were comparable to that of controls; however a significant increase in GST values (0.04 ± 0.02 vs 0.01 ± 0.006 U/ml) compared with controls was observed. The present observation confirms the similar biochemical pathogenesis, oxidative stress, in Indian patients of friedreich ataxia. We did not observe any correlation with frataxin levels and enzyme activity however the antioxidant enzyme levels were raised.

P/ CNS/27

Effect of altered breathing patterns on frontal alpha activity of EEG in human subjects

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Background: Alpha waves in EEG can be observed predominantly at the parieto-occipital region of the brain in an awake, relaxed person. However, various reports show dynamic changes in alpha pattern in terms of its regional distribution and symmetry under different physiological challenges.

Objective: The study aim to investigate whether any change in breathing pattern alter alpha activity in the anterior region of the brain as compared to resting pattern.

Material & Method: To achieve this objective, EEG was recorded from the frontal region following standard procedure after medical screening in awake, relaxed young adult males with eyes closed before and after mild Hyperventilation (mHV for 3 min), Slow Deep Breathing (SDB) and Breath-holding (BH). Six five second artifact free EEG epochs were randomly selected in between each intervention and averaged. Changes in EEG power were expressed as percent - deviation from basal for statistical analysis.

Results: There was no marked change in alpha, theta and delta activity in the frontal region bilaterally, following SDB. However, after mHV, a significant increase in alpha activity was observed bilaterally in frontal region (Left: $42.32 \pm 13.6\%$; $p < 0.001$ and Right: $26.44 \pm 10.3\%$; $p < 0.001$) having marked asymmetry with left side dominance. The trend was reversed post-BH where a significant decrease in frontal bilateral alpha activity was observed (Left: $14.32 \pm 6.2\%$; $p < 0.01$ and Right: $17.24 \pm 6.3\%$; $p < 0.01$).

Conclusion: Changes in alpha patterns reflect variations in thalamo-cortical oscillations in response to different respiratory challenges which may depict altered status of oxygenation / hypoxic states in the frontal region which otherwise has beta wave predominance.

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P/ CNS/28

Consanguineous marriages: A preventable cause for Sensorineural Hearing impairment in children

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Background : Hindus of South India particularly in the states of Karnataka, Andhra Pradesh, and Tamil Nadu, strongly favour marriage between first cousins. Uncle-niece marriages are also widely contracted. One of the detrimental health effect associated with consanguinity is hearing impairment.

Objective : The aim of this study was to find the strength of association of family history and consanguinity with permanent hearing impairment in infants and preschool children's

Materials and methods : It was a comparative study involving 150 children aged between 1 month -5 years born out of consanguineous marriages and 50 children without parental history of consanguinity who attended pediatric OPD. BERA testing was done with RMS EMG EP MARK-II machine. Student's unpaired 't' test was used for statistical analysis

Results : Out of 150 cases with positive history of parental consanguinity, 112 had hearing impairment. No BERA waves were recordable in 34 of 112 children. Remaining 78 had mean wave V threshold 52.36 ± 21.41 dB, which was highly significant statistically when compared to the controls (32 ± 0.1 dB) without any history of consanguinity. Absolute latencies (in ms) of the wave V were 6.57 ± 0.51 and 6.43 ± 0.35 and IPL III – V were 2.72 ± 0.49 and 2.12 ± 0.32 in consanguineous and non-consanguineous group respectively and the difference was statistically significant.

Conclusion : A well planned counseling program to create awareness regarding the adverse effects of consanguineous marriages will be helpful in preventing hereditary hearing impairment. Screening tests like BERA need to be done in all the at risk neonates so that we can pick up any abnormality at an early stage and timely intervention can be undertaken.

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P/ CNS/29

Motor cortex mapping: an essential intraoperative neurophysiological technique for neurosurgery

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Background: Motor cortex mapping is an indispensable intraoperative neurophysiological tool for the neurosurgeons when presented with the singular challenge of lesions present in close proximity to the motor cortex. It is a specific intra-operative neuromonitoring technique which provides guidance to the neurosurgeons to

accomplish lesionectomy without motor deficits despite distorted brain architecture.

Objective: To underline the vital role of intraoperative motor cortex mapping in identifying the motor cortex and thus provide guidance to the neurosurgeons during surgery and minimize potential motor deficits.

Material and Methods: For intraoperative identification of the motor cortex, direct cortical stimulation (DCS) with a monopolar stimulation probe was done. Motor evoked responses were recorded on the contralateral side of the body from various muscles of face, lower limb and upper limb by needle EMG electrodes.

Results: Motor cortex mapping was employed to identify the motor cortex in a total of 11 cases of intracranial surgeries. Motor cortex was successfully identified all of the cases.

Conclusion: Motor cortex mapping is an essential and effective technique for identification of motor cortex during critical intracranial surgeries where close proximity of the lesion make it difficult to prevent motor deficits.

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P2. CVS

P/ CVS/1

Variations in Peripheral Pulse Wave Velocity, Carotid-Femoral Pulse Wave Velocity, Central Aortic Pressure, Augmentation Pressure and Augmentation Index in Normotensive Subjects in Relation to Demographic and Anthropometric Profile

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Background : In current times, mortality due to cardiovascular diseases (CVD) is rapidly increasing and hypertension (HTN) is a major risk factor for CVD. Advancing age, obesity, dyslipidemia, hyperhomocystenemia are common risk factors for development of atherosclerosis which increases arterial stiffness and decreases compliance of vessels. Velocity of the peripheral reflected pulse wave (PWV) is an index of peripheral arterial stiffness. Sum of incident pressure wave generated by left ventricular systole and of the reflected pressure wave from the peripheral arterial system produce the peak systolic central (aortic root) pressure. This augmentation effect makes central blood pressure (BP) different from brachial BP and this is the pressure directly exerted on

heart, brain, kidneys. Central (aortic) BP apart from routine brachial artery BP measurement is found to be an independent predictor of HTN outcome. In apparently healthy individual with compliant vessels, the reflected pressure wave reaches aortic root during diastolic phase whereas in case of arterial stiffness the reflected wave reaches during the systolic phase thereby increasing the peak systolic pressure considerably resulting in higher augmentation pressure and augmentation index.

Objective : The purpose of this study was to know physiological variations in peripheral pulse wave velocity, carotid-femoral pulse wave velocity, central aortic pressure, augmentation pressure and augmentation index with respect to demographic parameters like age, gender, height, weight, Body Mass Index (BMI), waist circumference, hip circumference, waist-hip ratio.

Material and Methods : Participants: 98 normotensive volunteers between the ages of 18 and 60 years belonging to both genders were enrolled for the study. The study was approved by Institutional Review Board (IRB). Informed written consent was taken from all participants. Demographic, anthropometric and test data was entered in a case report form.

Exclusion criteria: Hypertension (Essential and Secondary), Diabetes Mellitus (DM), arrhythmias, Coronary Artery Disease (CAD), Renal parenchymal or renal vascular disease, Peripheral Vascular Diseases (PVD).

Anthropometric measurements: Height, weight, waist and hip circumference was measured using Bio-Plus Stature Meter, Krups Weighing Scale, Flexible tailoring meter respectively. BMI and Waist:Hip ratio was calculated.

Cardiovascular parameters: Peripheral arterial and central arterial parameters were recorded using PeriScope™ (Genesis Medical Systems Pvt. Ltd., Hyderabad, India).

Data compilation and analysis: Data collected was tabulated in MS Excel 2007, imported into SPSS 17.0 and analysed.

Results : Multiple linear regression was carried out by forward method to know the best predictors (among demographic and cardiovascular) parameters for Brachial-ankle pulse wave velocity, Carotid-femoral pulse wave velocity, Aortic systolic, diastolic and augmentation pressure, augmentation index and estimated vascular age. Age and right ankle diastolic pressures were good predictors of right brachial-ankle pulse wave velocity where as age and left brachial diastolic pressures were good predictors of left brachial-ankle pulse wave velocity. Right and left brachial-ankle pulse wave velocities in turn were predictors of carotid-femoral pulse wave velocity. Right and left brachial systolic pressures and carotid-femoral pulse wave velocity predicted the aortic systolic pressure. Predictors of aortic diastolic pressure were right and left brachial diastolic pressure, left ankle diastolic pressure, right brachial-ankle pulse wave velocity and hip circumference. Right and left brachial systolic and diastolic

pressures and carotid-femoral pulse wave velocity were good predictors of aortic augmentation pressure. Carotid-femoral pulse wave velocity, right brachial systolic and diastolic pressures and height were the predictors for augmentation index.

Conclusion : There was no statistically significant effect of demographic parameters like gender, weight, height, waist circumference and hip circumference on prediction of Brachial-ankle pulse wave velocity, Carotid-femoral pulse wave velocity, Aortic systolic, diastolic and augmentation pressure, augmentation index and estimated vascular age, except for age which was significant predictor of Brachial-ankle pulse wave velocity.

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P/ CVS/2

Effect of Body Mass Index on Cardiac Output after Angioplasty in Patients of Acute Myocardial Infarction

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Background: Generally overweight and obese are at more risk of developing cardiovascular diseases. But few researchers found that when coronary artery disease (CAD) developed in overweight and obese patients, it does not cause poor clinical outcome accordingly. There are very few numbers of studies done to find out relation between body mass index (BMI) and outcome of angioplasty in the context of acute coronary syndrome (ACS).

Objective: To find out effect of BMI on outcome of angioplasty in acute myocardial infarction (AMI) patients.

Material and Methods: In the present study, Cardiac output (CO) of 52 patient of AMI were assessed by echocardiography before and after (2 weeks) of angioplasty. End diastolic volume (EDV), End systolic volume (ESV) & Left ventricular outflow tract (LVOT) diameter, measured by ECHO were used to calculate CO. Statistical software SPSS version 19 was used for analysis of data.

Results: Analysis of data showed that overweight and obese patients had improved CO in comparison to underweight after angioplasty. There is weakly positive correlation ($r=0.110$) which is insignificant ($p=0.437$).

Conclusion: Increased BMI is not necessarily associated with poor outcome after angioplasty in acute MI patients.

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P/ CVS/3

Study of Heart Rate Variability on Rheumatoid Arthritis

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Background : Increased Heart rate and decreased hrv might be associated with increased mortality in patients with rheumatoid arthritis.

Objectives : To assess heart rate variability in patients of rheumatoid arthritis.

Materials and Methods : The study was conducted on 30 rheumatoid arthritis patients in the age group of 20-70 years and 30 healthy age and sex matched controls. Short term analysis of Heart rate variability was performed for time domain and frequency domain parameters .This study was conducted to evaluate the effect of autonomic function test on rheumatoid arthritis. Basal Blood pressure and 12 lead ECG was recorded. Heart rate variability was done with MEDICAID STUDENTS PHYSIOPAC and analyzed with KUBOIS software VERSION 2.1.Data was analyzed using statistical software STATA 11.2 using ANOVA. Significance of p value was taken as 0.05.

Result : Resting heart rate is higher in patient group than that of control group. Time domain indices of HRV, SDNN, RMSSD, NN50 are reduced in patients group. Frequency domain indices of HRV LF, LF/HF ratio significantly higher and HF significantly lower in patient group.

Conclusion : In patients with Rheumatoid arthritis Heart rate variability is altered.

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P/ CVS/4

Analysis of Heart Rate Variability in Premenopausal and Postmenopausal females

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Background: The premenopausal and postmenopausal phases of females are associated with changes in the Heart Rate Variability (HRV) that affects the autonomic regulations of heart.

Objective: This study concentrates on analyzing the HRV variations between the premenopausal (follicular phase of the menstrual cycle) and postmenopausal phases of females in the lying and standing postures by using nonlinear

methods of HRV such as Correlation Dimension (CD), Detrended Fluctuation Analysis (DFA) and Sample Entropy (SampEn).

Material and Methods: 20 females aged 18 to 25 years having regular menstrual cycle and 20 females aged 48 to 65 years having absence of the menstrual cycle for last 2 years volunteered for this study. ECG signals of follicular phase of the menstrual cycle and postmenopause were acquired using BIOPACÂ® MP150.

Results: The mean values are used to find out the changes in HRV variations between phases. The results are presented in the form of comparative analysis of detecting HRV variations correctly using statistical parameter, i.e., accuracy. The results proved that CD is more accurate in detecting the HRV variations between the premenopausal and postmenopausal females as compared to the DFA and SampEn in the lying and standing postures.

Conclusion: It is concluded that sympathetic activities are higher and parasympathetic activities are lower in the postmenopausal as compared to premenopausal females because of having lower HRV in the postmenopausal females both in the lying and standing postures. Further, CD is able to differentiate the HRV variations accurately between the premenopausal and postmenopausal females as compared to other nonlinear methods.

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P/ CVS/5

Metaboreflex Activation by Rhythmic Exercise as a Cardiovascular Risk in Metabolic Syndrome and Obesity.

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Background: The increasing prevalence of metabolic syndrome (MS) worldwide seems to be driven largely by obesity exacerbated by sedentary lifestyle. Some dysregulation in a mechanism causing cardiovascular and hemodynamic adjustments during exercise (Metaboreflex; a feed-back mechanism originating in skeletal muscle due to local metabolites) has been studied in detail in MS.

Objective: The purpose of the present study is to see the effect of metaboreflex by rhythmic handgrip exercise on hemodynamic parameters (Blood pressure, cardiac output(CO) and its index(CI), stroke volume(SV) and its index(SVI), pulse rate(PR), systemic vascular resistance(SVR) and its index(SVRI)) in subjects with MS and obesity.

Material and Methods: A total of 46 subjects, aged between 25 to 45 years of both the sex were enrolled in this

study and classified into a) subjects without MS with normal BMI b) subjects without MS with overweight/OW BMI c) subjects with MS with OW BMI and d) subjects with MS with obese BMI. Hemodynamic parameters were evaluated by impedance cardiography in supine position, after 5 minutes of rest. Maximum Voluntary Contraction was measured by Handgrip Dynamometer. Rhythmic handgrip exercise was done at 30% of the subjects' MVC (for 2 mins), followed by post exercise cuff occlusion to enhance metaboreflex, for 2 mins (20 mm Hg above systolic). The parameters were assessed after rhythmic exercise.

Results: Following exercise, there was vasoconstriction mediated pressor response (statistically significant increase in diastolic BP) and flow mediated pressor response (statistically significant increase in systolic BP) in normal subjects. In subjects without MS with OW BMI and subjects with MS with OW BMI, statistically significant decrease in SVR and SVRI was found. In subjects with metabolic syndrome with obese BMI, decrease in SV and SVI and statistically significant increase in PR was found.

Conclusion: In this study, it can be concluded that in subjects with overweight BMI decreases, vasoconstriction response due to metaboreflex decreases but in subjects with MS vasoconstriction and increased afterload occur after exercise.

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P/ CVS/6

Effect of Hypovolemia on Efficacy of Reflex Maintenance of Blood Pressure on Orthostatic Challenge

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Background : Blood volume is an important determinant of the efficacy of the negative feedback mechanisms that maintain blood pressure. However, effect of hypovolemia on the time profile and magnitude of responses remain unstudied.

Objective : To study the effect of mild hypovolemia on the time profiles and magnitude of changes in blood pressure and heart rate in healthy subjects before and after blood donation.

Materials and methods : 56 healthy volunteer blood donors (age 35 ± 7 years; weight 75 ± 9 Kg) were recruited for the study. Baseline beat-to-beat blood pressure and Lead II ECG was recorded for 5 minutes followed by orthostatic challenge (semi reclining to standing) for 3 minutes before and after blood donation.

Results : The donation of 450 ml of blood did not lead to any changes in the resting systolic, diastolic or mean blood pressure. However, there was a significant decrease in pulse pressure after blood donation and an increase in heart rate. During orthostatic challenge after blood donation, there was a greater fall in systolic, diastolic, mean and pulse pressure along with a greater increase in heart rate as compared to before blood donation. The latency to response and the total time to recovery of blood pressure and heart rate also increased significantly after blood donation.

Conclusion : Maintenance of blood pressure after orthostatic challenge is not compromised after mild hypovolemia produced by donation of 450 ml of blood. However, mild hypovolemia results in an increase in latency of response and is accompanied with larger magnitude of fall in blood pressure in early period of orthostatic challenge.

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P/ CVS/7

Assessment of Left Ventricular Diastolic Function in Young Obese Subjects

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Background: Obesity is associated with increased cardiovascular morbidity and mortality. A direct effect of isolated obesity on cardiac function in young age is not well established.

Objective: To determine the effect of obesity on left ventricular diastolic function by 2D Echocardiography and Tissue Doppler imaging technique.

Material and Methods: The left ventricular function was evaluated in 30 normal weight subjects (BMI < 23 kg/m²), 30 overweight subjects (BMI 23-25 kg/m²) and 30 obese subjects (BMI > 25 kg/m²) in the age group of 20-40 years of both genders. They had no other pathological conditions. Peak early transmitral diastolic flow velocity (E), late transmitral diastolic flow velocity (A), early diastolic mitral annulus velocity (E1), Isovolumetric relaxation time (IVRT), and Deceleration time (DT) were measured. E/A and E/E1 were calculated.

Results: The E/A was lower in obese subjects than in normal weight subjects ($p < 0.05$). Overweight and obese subjects had lower E1 ($p < 0.05$) and higher E/E1 (both $p < 0.05$), increased Isovolumetric relaxation time and increased deceleration time (both $p < 0.05$), than normal weight participants.

Conclusion: The increased risk of LV diastolic dysfunction in both overweight and obese persons may partially

account for the increased risk of heart failure. In young obesity, promoting optimal body weight will result in improvement of left ventricular (LV) diastolic function, and may have a beneficial effect in preventing the future development of heart failure.

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P/ CVS/8

A Case Control Study of Autonomic Function Test in Rheumatoid Arthritis Female Patients

SADHANA AGRAWAL, JYOTSNA SHUKLA

Background: cardiovascular autonomic functions are deranged in Rheumatoid Arthritis (RA) patients.

Objective: Evaluation of cardiovascular autonomic neuropathy (CAN) in RA patients.

Material and Methods: "Thirty female RA patients diagnosed as per ACR-EULAR Classification criteria 2010 and thirty age matched healthy female controls were taken for the study. Tests for Parasympathetic function tests-(1) HR response to deep breathing (2) HR response to standing (3) High Frequency normalised units (HF nu) Tests for Sympathetic function tests-(1) BP response to standing (2) BP Response to sustained handgrip (3) Low frequency normalised units (LF nu). Analysis of data was done using statistical software primer version 6 and the level of significance was assigned using unpaired t-test."

Results: "Deep breathing difference (DBD) and Expiratory/Inspiratory (E/I) ratio both found lowered in RA group as compared to control ($P \leq 0.05$) and HF nu is found lowered in RA group as compared to control ($P \leq 0.03$). HR response to standing is found lowered in RA group as compared to control but statistically insignificant ($P > 0.05$). BP response to sustained handgrip is found lowered in RA group as compared to control ($P \leq 0.05$) and LF nu is found higher in RA group as compared to control ($P \leq 0.03$). BP response to standing is found higher in RA group but not statistically significant ($P > 0.05$)."

Conclusion: Early detection of cardiac autonomic neuropathy in RA patients can help in early institution of treatment and can prevent the morbidity.

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P/ CVS/9

Comparative study of preprandial and postprandial heart rate variability between obese and non obese young women

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Background : In obesity as excessive fat accumulates, an altered metabolic profile occurs along with a variety of adaptations/ alterations in the cardiac structure and functions even in the absence of co-morbidities.

Objective : To study Heart rate variability (HRV) and to compare it in preprandial and postprandial state in obese and non obese young healthy females.

Material and Methods : 50 obese and 50 non obese young healthy females aged between 21-25 years were selected based on body mass index. HRV was recorded in both pre and postprandial state by using digital finger pulse photoplethysmography. It is computer based software which analyses various frequency components i.e total power (TP), low frequency (LF) and high frequency (HF) components. All the statistical analyses were carried out by using SPSS version 16.0. Unpaired t test was applied to compare the mean values of the two groups. P value < 0.05 was considered statistically significant.

Results : HRV analysis found significantly lower values of LF, HF (when expressed in ms^2) & higher values of LF (when expressed in normalised units) and LF/HF ratio among the obese group in both pre and post prandial state when compared to non-obese group.

Conclusion: Our data indicate that obese subjects have decreased parasympathetic activity as evidenced by decrease in TP (ms^2), LF (ms^2), HF(ms^2) and HF(nu) and increase in sympathetic activity as evidenced by increase in HR, LF(nu) and LF/HF ratio in both pre and post prandial state.

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P/ CVS/10

The Impact of Exercise in Cardiac Troponin I Release in Healthy Subjects

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Background : Elevated serum cardiac troponin (cTn) levels are not restricted to acute coronary syndrome (ACS) but is also frequently observed following exercise in healthy individuals.

Objective : To investigate the effects of a maximal treadmill exercise test on the cardiac troponin I levels in healthy individuals.

Material and Methods : In this cross sectional study, 50 healthy volunteers (age 18-34 years;males=32,females=18;VO₂ max 54.60±7.52) were recruited from among the staff and students of RIMS. The serum levels of cardiac troponin I were measured before and within 30 minutes after performing a maximal treadmill exercise (Bruce protocol) in the department of Physiology RIMS,Imphal.

Results : Before exercise, all individuals had undetectable CTn I levels. After exercise, 28 individuals (54%) had a rise in circulating CTn I (.858 ± 1.215 ng/ml ; p<0.001). 18(64%) individuals had levels above the Upper Reference Limit (=1ng/ml) out of which 11 had levels above the cut off value for Myocardial Infarction (= >1.5ng/ml).

Conclusion : The findings suggest the release of CTn I in healthy subjects after a standardized exercise test.Thus, history of recently performed exercise should be taken into consideration in the evaluation of acute chest pain with release of cardiac TnI.

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P/ CVS/11

Estimation of Vascular Resistance and Compliance in a Rat Hindlimb Preparation

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Background : Windkessel model is a simplified physical model of the vascular system which relates blood flow(I) and pressure(P) in the arteries with the parameters resistance(R) and compliance(C). It is represented in the following differential equation:

$$I(t) = P(t)/R + C(dP/dt)$$

Using a custom-written algorithm, resistance and compliance were calculated in real time using pressure and flow data.

Objective : Validation of an algorithm to estimate vascular resistance and compliance using windkessel model of arterial system

Materials and methods : Rats were anaesthetised and descending aorta cannulated and perfused with physiological salt solution containing albumin using a peristaltic pump. The trunk was dissected below the level of diaphragm.The perfusate flowed freely throught the cut IVC. Aortic pressure was recorded using a pressure

transducer connected to CMCdaq data acquisition system. Since flow rate of the pump was known, the flow versus time curve was derived. The algorithm developed by us used varying combinations of resistance and capacitance values by iteration, to output a pressure curve from flow data. The derived pressure curve which best-matched the measured pressure curve was arrived at. The resistance and capacitance values for that iteration with the best fit for measured pressure was determined as actual R and C values for that beat. Beat to Beat Resistance was also calculated using the expression Mean Blood Pressure / Flow.

Results : Resistance estimated with the algorithm was compared to resistance obtained from MBP/Flow. Pearson's corellation coefficient between the two was 0.97 ± 0.04(n=6). The Mean Absolute Percentage Error of the estimated value was 8.9 ± 3.5%.

Conclusion : A rat hindlimb preparation serves as a reliable experimental model for studying changes in vascular resistance and compliance.

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P/ CVS/12

Relevance of Inter Arm Blood Pressure Difference in Young Healthy Individuals

SEETHALAKSHMI K, BIJU BAHULEYAN

Background : Overall prevalence of hypertension in India is 33% in urban areas and 25% in rural areas. 10% of young population suffers from pre-hypertension. Current WHO guidelines recognise the need to check blood pressure in both arms, which is not followed by many clinicians. An appreciation of the potential for inter-arm blood pressure difference is vital for diagnosis and management of hypertension. It has a prognostic value as a risk factor for future cardiovascular events , peripheral vascular disease etc. This study emphasizes the importance of incorporating measurement of Inter arm blood pressure difference in routine clinical practice and analyses if family history of hypertension and BMI has any correlation with it.

Objective : To find out inter arm blood pressure difference in young, healthy individuals & to assess its correlation with family history of hypertension and BMI of the subject.

Materials and methods : This cross-sectional study was conducted in Jubilee Mission Medical College, Thrissur.We enrolled 110 MBBS students of(18-25) years age group, both males and females.Proforma was filled up and BP was measured sequentially in both arms,using mercury sphygmomanometer, first on right arm followed by left.

Results : In all, 51 of 110 subjects had mean systolic inter arm BP difference ≥ 10 mm Hg and 38 of 110 subjects had diastolic inter arm BP difference ≥ 5 mmHg. Mean \pm SD of right arm systolic BP is 107.87 ± 11.59 , left arm systolic BP is 101.73 ± 10.58 , right arm diastolic BP is 71.73 ± 8.75 , left arm diastolic BP is 70.62 ± 8.16 , which shows higher BP on the right arm. There is statistically significant difference between systolic blood pressures of both arms (95% confidence interval, p value=0.0001) and diastolic blood pressures of both arms (95% confidence interval, p value= 0.034). Inter arm blood pressure difference is higher in subjects with family history of hypertension though it is insignificant statistically (p value= 0.512). Correlation between BMI and inter arm blood pressure difference is also negative.(p value=0.07).

Conclusion : Inter arm blood pressure difference is present in normal, healthy young adults with higher pressure on right arm. Hence emphasis should be given for assessment of blood pressures in both arms in clinical practice. If the difference is above normal, it can be taken as an indication of cardiovascular risks and therefore managed with life-style changes

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P/ CVS/13

Differential Relationship of Hemodynamic Parameters with Central and Peripheral Arterial Segments in Metabolic Syndrome

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Background : Central and peripheral arterial stiffness reflect the function of elastic and conduit arteries respectively. In addition, derangement in hemodynamic parameters has been shown to influence the arterial stiffness. The hemodynamic changes in patients of metabolic syndrome due to clustering of multiple risk factors can potentially cause arterial stiffness and in turn, increase their susceptibility to develop cardiovascular disease (CVD).

Objective : The objective of this study was to evaluate the relationship of central and peripheral blood pressure with the central and peripheral arterial stiffness in patients of metabolic syndrome.

Materials and methods : Patients of metabolic syndrome according to NCEP ATP III criteria (n=42), age 59.9 ± 8.3 years, were recruited and arterial stiffness was assessed by applanation tonometry using Sphygmocor® device. Augmentation Index (AIx@75) and carotid-femoral Pulse Wave Velocity (PWV) were used as a measure of central arterial stiffness and carotid-radial PWV was

measured to assess peripheral arterial stiffness. Non-invasive central blood pressures were recorded by placing the same tonometer probe on the radial artery and subsequent standardized transfer function analysis by the software. Peripheral blood pressure was measured by using a mercury sphygmomanometer.

Results : Linear correlation analysis demonstrated a significant correlation between AIx@75 and central Pulse Pressure (PP) ($r=0.40$, $p=0.008$) and a non-significant weak correlation between carotid-femoral PWV and central PP ($r=0.32$, $p=0.06$). On the other hand, carotid-radial PWV correlated significantly with both the central ($r=0.36$, $p=0.018$) and peripheral ($r=0.38$, $p=0.012$) diastolic blood pressure.

Conclusion : The correlation of diastolic blood pressure with carotid-radial PWV indicates a possible influence of resting vascular tone on peripheral arterial stiffness. On the other hand, measures of central arterial stiffness better reflect the changes in the central pressures and would be a better indicator of increased cardiovascular risk.

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P/ CVS/14

Study of effects of obesity on cardiac autonomic functions

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Background : Obesity is emerging as a global epidemic, significant health hazard irrespective of age, sex and race. Since ANS is involved in energy metabolism and regulation of CVS, it is conceivable that one or more sub-groups of obesity have an alteration in autonomic nervous system which lead to several clinical consequences of obesity especially the cardiovascular conditions like hypertension, IHD and stroke.

Objectives : To determine whether there is altered cardiac function in obese adults of both the sexes. Since there is dearth of literature for comprehension studies in relation to autonomic function, so this study has been attempted.

Material and Methods : The present study was carried out on 60 healthy volunteers within age group of 20-55 yrs. Out of which 30 subjects with BMI > 30 kg/ m sq were included in the study group and 30 subjects with BMI < 30 kg/ m sq were included in control group. The Autonomic nervous system function was evaluated by six non-invasive tests, four of which are based mainly on parasympathetic control [30:15 ratio, standing to lying ratio(S/L ratio), the valsalva maneuver, the HR response to deep breathing] and 2 sympathetic tests (BP response to standing and cold pressure test).

Results : There is a significant changes observed in both sympathetic and parasympathetic function observed in obese group than in control group.

Conclusion : In this study it is seen that obesity has got a significant influence on autonomic status, in turn the cardiac functions and health status of the individual.

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P/ CVS/15

Effect of Frequency Dependent Oscillations of Arterial BP on Dynamic Cerebral Autoregulation

SHIVANGI, ASHOK KUMAR JARYAL, KISHORE KUMAR DEEPAK

Background : Dynamic cerebral Autoregulation (DCA) refers to pressure - flow relationship observed during transient changes in arterial blood pressure and takes place over seconds. It has been observed that fast transient fluctuations in arterial blood pressure are transmitted to cerebral circulation almost linearly, whereas, cerebral circulation effectively buffers slower fluctuations in BP suggesting that DCA is a frequency dependent phenomenon. However, the frequency dependent nature of cerebral autoregulation is inadequately studied.

Objective : To study the effect of frequency dependent oscillations of arterial blood pressure on Dynamic Cerebral Autoregulation.

Material and Methods : The study was conducted on 8 healthy subjects aged 20-30 years. Lower body negative pressure was used to induce oscillations in the arterial blood pressure by a magnitude of 6-10 mmHg at 3 different frequencies (0.03Hz, 0.05Hz and 0.1Hz). Simultaneous recording of Beat-to-Beat BP and middle Cerebral artery Blood Flow Velocity (mCBFV) was done using Non-invasive blood pressure recorder (Portapres) and Transcranial Doppler (TCD) respectively.

Results : Coherence between mean arterial blood pressure and mean mCBFV was analyzed. One-way ANOVA was used for statistical comparison of coherence at the 3 frequencies i.e., 0.03Hz, 0.05Hz and 0.1Hz (Mean \pm SD 0.33 \pm 0.15, 0.43 \pm 0.24, 0.63 \pm 0.24). Coherence was significantly higher at 0.1Hz as compare to 0.03Hz (Mean \pm SD 0.63 \pm 0.24 vs 0.33 \pm 0.15, $p < 0.05$).

Conclusion : These observations indicate that cerebral autoregulation acts as a high-pass filter for high frequency oscillations in blood pressure, which gets transferred into oscillations of cerebral blood flow.

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P/ CVS/16

Relationship of Ventricular Ejection Fraction and Ejection Duration in MI Patients

EDMIN CHRISTA, ASHOK KUMAR JARYAL, RAJ KUMAR YADAV, AMBUJ ROY, KISHORE KUMAR DEEPAK

Background : Left ventricular ejection fraction is the most commonly used clinical measure of Left ventricular systolic function and is one of the powerful determinants of mortality after Myocardial Infarction (MI). Increased arterial stiffness which is a surrogate indicator of left ventricular systolic loading, increases the left ventricular ejection duration and negatively influence the myocardial perfusion contributing to Myocardial Infarction. Though both the parameters are indices of myocardial health, the relationship of both these parameters are not well documented. We therefore, assessed the relationship between ejection fraction and ejection duration in Myocardial infarction patients.

Objective : To study the relationship between ejection fraction and ejection duration in Myocardial infarction patients.

Material and Methods : Study group of 10 males aged 35 to 64 years with myocardial infarction from the Yoga Cardiac Rehabilitation trial receiving standard care were tested. The radial pulse wave was recorded using applanation tonometry. The pulse wave analysis index and ejection duration was derived using the SphygmoCor validated transfer function. Left Ventricular Ejection fraction was calculated using 2D echocardiography. Both the testing was done at the 3rd week post MI in the Department of Physiology and Cardiology at AIIMS, New Delhi.

Results : Ejection fraction was analyzed in relation to ejection duration in ten MI patients with a mean age of 48.60 ± 10.68 years and BMI of $23.85 (22.89 - 26.46)$ Kg/m². The patients had mean \pm SD ejection duration of $34.40 \pm 4.57\%$ and ejection fraction of $54 \pm 6.99\%$. Univariate correlation was evaluated with Pearson's correlation coefficient between ejection duration and ejection fraction. It was found that ejection fraction correlated significantly with ejection duration ($r = 0.65$; $p = 0.03$).

Conclusion : We report significant correlation between ejection fraction and its duration. Relying on ejection fraction as a major predictor of sudden cardiac death post MI may limit its predictive power due to the occurrence of incidences in patients with normal ejection fraction also. Therefore considering positive correlation, the Ejection duration may be used as a reliable quantifier of risk stratification in patients post MI in adjunct to Ejection fraction. Large cohort studies are required to determine cut off values for these parameter.

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P/ CVS/17

Are ryanodine receptors important for diastolic depolarization in heart ?

**TEENA MARIA JOSE, JESI W,
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Background : On the surface of sarcoplasmic reticulum there are mainly two types of Ca²⁺ channels for releasing Ca²⁺ from it- Ryanodine receptors and IP₃ receptors. The best known role of RyR 2 in cardiac muscle is Ca²⁺ release during systole to produce contraction. In this study we wanted to see if RyR 2 is also responsible for diastolic Ca²⁺ release for pacemaking. The role of Ryanodine receptors is studied using the receptor blocker Ryanodine in isolated wistar rat hearts.

Objective : To study the changes in heart rate after addition of 100ÅµM Ryanodine. If RyR is involved in diastolic Ca²⁺ release addition of Ryanodine should decrease the heart rate.

Materials and methods : Rat hearts were isolated after giving anesthesia. Isolated hearts were initially perfused with normal mammalian ringer for 15 minutes followed by Ryanodine 100ÅµM (n=6) for 15 minutes in a Langendorff mode. The percentage change in heart rate after addition of Ryanodine compared to pre-intervention readings and analyzed using Wilcoxon signed-Rank test.

Results : There is a 44% reduction in heart rate with Ryanodine(p=0.0004).

Conclusion : This study confirms the importance of Ryanodine receptors for diastolic Ca²⁺ release which is important for pacemaking. Since there is no stoppage of heart after addition of Ryanodine proves that other receptors like IP₃ are also important for diastolic Ca²⁺ release.

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P/ CVS/18

Role of Respiratory Rhythm Generation in Blood Pressure Variability

**NEETU PRINCE, BENJAMIN JEBARAJ,
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Background : Low frequency blood pressure variations which occur at the frequency of respiration are called Traube & Hering waves. Some recent reports propose that changes in intra thoracic pressure that occur with

respiration and the corresponding changes in stroke volume are responsible for blood pressure variability. Traube and Hering however had already shown that respiratory movements are not necessary for these waves and that they can occur even in curarised animals. They concluded that the immediate cause for such pressure variation was the cyclical variation in the vasomotor tone and the root cause was changes in the respiratory rhythm. Studies have also shown that in voluntary breath holding, pressure variability still persists, thereby excluding the role of respiratory movements in BPV. We provide here the most direct evidence to support the view that BPV is dependent on respiratory rhythm.

Objective : To study the role of respiratory rhythm in blood pressure variability.

Materials and methods : Wistar rats were anaesthetized with ketamine (100mg/kg). ECG, Respiration and intra arterial pressure (carotid) was recorded with the CMC data acquisition system. Baseline recording was continued for 30 mins. Adrenaline at a dose of 2mg/kg was administered to induce apnoea in the animals to study the blood pressure variability in relation to respiration.

Results : Blood pressure variability was observed during the baseline recording but variability was totally abolished during period of adrenaline apnoea.

Conclusion : "Slow frequency variations in blood pressure (traube waves) is not just entrained to respiratory rate but respiratory rhythm generation is mandatory for the same.

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P/ CVS/19

Assessment of Cranial Blood Flow in Cervical Spondylosis Patients

**MUKESH KUMAR, R. C. SIWACH,
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Background : The effect of rotation of head movement on cerebral artery blood flow in normal subjects has been widely studied. Many factors effect blood flow through the vertebral artery such as rotation of head, variably sized arteries, atheroma, tortuous vertebral arteries, carotid sinus compression etc.

Objectives : To determine the effect of head and neck movement on the cranial blood flow in cervical spondylosis patients with reticulopathy

Material and Methods : 100 human subjects with informed consent (20-70 years) participated in this study (50 healthy adults + 50 cervical spondylosis patients with reticulopathy). Subjects with severe hypertension, cardiovascular, liver, kidney or other life threatening diseases were excluded. The changes in the Anterior,

Middle, and Posterior cerebral arteries blood flow between the neutral (face to front) and rotated head positions (flexion and extension) was measured with Trans-cranial Doppler Method in healthy and Cervical Spondylosis with reticulopathy patients.

Results : No significant differences in the afferent cerebral blood flow of the neutral and of the changed head positions in normal healthy subjects was found. In Cervical Spodylosis patients with reticulopathy, the mean values of cerebral blood flow were insignificantly different as compared to healthy subjects, however according to the data collected till now, the lowest blood inflow level was recorded during extension of the head. Flow changes were less than 10% considered to be normal.

Conclusion : The flow changes in the afferent cerebral arteries of healthy subjects were insignificant. When a person has cervical spondylosis with reticulopathy, flexion and extension of head may diminish blood flow through the vertebral artery in its course through the cervical spine. Further studies and data are required to establish association.

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P/ CVS/20

Association of Baroreflex Sensitivity and Pulse Wave Velocity in Type 2 Diabetes with Newly Diagnosed Hypertension

**PRACHI DEVI/SRIVASTAVA,
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Background: Diabetes is associated with impaired cardiovascular function and is often accompanied by hypertension. Arterial stiffness and impaired Baroreflex sensitivity (BRS) are important risk factors for cardiovascular diseases. Arterial stiffness may contribute to the impairment of baroreceptor sensitivity. In this study we investigated the association between BRS and arterial stiffness in type 2 diabetes with newly diagnosed hypertension.

Material and methods: Nine patients of diabetes with newly diagnosed hypertension (Mean age= 49.8±6.7 yrs) participated in the study. Continuous beat to beat BP and lead II ECG were recorded in during supine rest. BRS was calculated by spontaneous changes in systolic BP and corresponding R-R intervals by sequence method. Arterial stiffness was measured by carotid distal pulse wave velocity (Carotid- Dorsalis Pedis, PWVcd) using applanation tonometry (SphygmoCor).

Results: Baroreflex sensitivity and pulse wave velocity (Carotid-distal) were 6.6±2.6 ms/mmHg and 8.8 ±1.0 m/s

respectively in type 2 diabetes with newly diagnosed hypertension. There was a strong negative correlation between BRS and PWVcd (Pearson r = -0.89, p=0.001) in the patients.

Conclusion: Impaired BRS found to be strongly correlated with arterial stiffness in type 2 diabetes with newly diagnosed hypertension. Increased stiffness may be a contributing factor in impairment of BRS in these patients.

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P/ CVS/21

The Impact of Iron Supplements on the Incidence of Re-Hospitalization in Post-MI Patients with Persistent HAA

**SRIVASTAVA RK, SUNEEL KUMAR, SHARMA R,
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Background : Post-MI patients discharged with mild to moderate persistent HAA are susceptible to the worst clinical out-comes and poorer status of health amounting frequent re-hospitalization.

Objective : To find out whether iron supplement to post-MI patients having persistent HAA would affect on the frequency of re-hospitalization

Material and Methods : 40 post-MI patients with moderate persistent HAA were enrolled following inclusion, exclusion criteria and written consent from patients. Two groups were made, each group had 20 patients. One group of patients received iron supplement daily while other group did not receive iron supplement for six months. All patients were on prescribed medication for post- MI and were followed up in Cardiology OPD at one month, 3months and 6months. Clinical assessment, status of health and hematological examination were recorded.

Results : The patients who were on iron supplements achieved normalization of HAA. There was increase in hemoglobin concentration to a normal levels and improved the status of health and clinical outcomes. This reflected no re-hospitalization in iron treated patients compared to untreated patients who required re-hospitalization for the management of cardiac complications including recurrence of myocardial infarction, cardiac failure, hypertension, and renal failure.

Conclusion Our study revealed the need of iron supplements to post-MI patients with persistent HAA to protect re-hospitalization

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Serum Lipid Profile in Coronary Artery Disease among the population of Assam at Gauhati Medical College

REETA BAISHYA

Background : Relation between high level of serum cholesterol and coronary artery disease (CAD) is well known. No data is available about serum lipid profile among the population of Assam with CAD. It may vary in different communities throughout the world.

Objective : To identify the serum lipid profile abnormalities among the population of Assam with CAD and to find out the role of different risk factors associated.

Material and Methods : Thirty CAD patients are selected randomly from the cardiology department, between 21 -60 years. Result are compared with a control group of non-CAD individuals of same age. Serum lipid level and Blood sugar are estimated by enzymatic colorimetric method and glucose oxidase peroxidase method by auto analyzer respectively.

Results : Serum lipid level are altered in the test group. Serum cholesterol, LDL cholesterol and triglyceride are elevated and $p < 0.01$ which is significant in all, whereas HDL cholesterol is low, $p < 0.01$ which significant when compared with control. CAD is more between 51 -60 years and male are more affected. 20% are diabetic with positive family history and 10% are hypertensive. 54% are overweight. 66.66% are smokers.

Conclusion : Lipid abnormalities (dyslipidemia) are present in all patients. Risk factors are smoking, overweight, positive family history, diabetes mellitus and hypertension. Dyslipidemia among population of Assam needs public awareness and promoting healthy diet and physical activity. Routine screening of high risk group for dyslipidemia and other risk factors should be encouraged.

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Correlation of Heart Rate Variability and Stress in Medical Students

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Background : Medical students are constantly exposed to stressors like huge syllabus, clinical postings, exams, lack of sleep and other factors. Stress induces change in the

cardiovascular autonomic nervous system modulation which increases the risk of cardiovascular disease. The level of stress, specifically in medical students can be assessed by the Medical Students Stressor Questionnaire • (MSSQ). Short term heart rate variability (HRV) analysis, a noninvasive tool, measures the autonomic tone.

Objective : To assess the heart rate variability among the medical students and correlate it with the level of cumulative stress.

Materials and methods : 150 medical students were included in the study after obtaining written informed consent. MSSQ was filled by all 150 students and analyzed for stress levels. Lead II ECG was recorded for 5 min in supine position for short term HRV analysis. Time domain and frequency domain indices were calculated. The cumulative stress was correlated with Time domain and frequency domain indices.

Results : Female students had a significant decrease in time domain indices RMSSD, SDNN and pNN50 in comparison to male students. Among frequency domain indices, Total Power and HFnu were significantly reduced and the LFnu and LF-HF ratio were significantly increased in female students. The Total power and RMSSD had a significant negative correlation with the cumulative stress.

Conclusion : Female medical students have decreased heart rate variability in comparison to male students, and this can be associated to the increased stress in female medical students.

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Effort Dependence of Valsalva maneuver for Estimation of Baroreflex Sensitivity

SHIVAL SRIVASTAV, PRIYANKA GARG, ASHOK KUMAR JARYAL, KISHORE KUMAR DEEPAK

Background : Valsalva maneuver (VM) is one of the techniques commonly used for assessment of Baroreflex sensitivity (BRS). But performance of the maneuver at effort of 40 mm Hg may be a problem in some patients

Objective : We investigated if the maneuver may be performed at lower effort for BRS estimation.

Materials and methods : Twenty three healthy males (mean age = 26.3 ± 6.29 yrs) participated in the study. Valsalva maneuver was performed for 15 seconds each at expiratory effort of 10, 20, 30 and 40 mm Hg in supine position. Continuous beat to beat BP and Lead II ECG were recorded. BRS was computed using slope of regression curve between RR interval and Systolic BP during Phase II

of VM designated as VM10, VM20, VM30 and VM40 respectively based on expiratory effort.

Results : VM showed well characterized phases in 9, 14, 18 and 23 subjects at efforts of 10, 20, 30 and 40 mm Hg respectively. Therefore BRS was computed for these subjects only. There was no significant difference between BRS at different efforts \hat{c} VM10, VM20, VM30 and VM 40 ($6.77 \hat{A} \pm 3.79$, $5.24 \hat{A} \pm 3.0$, $5.43 \hat{A} \pm 3.52$ and $5.71 \hat{A} \pm 3.11$ ms/mm Hg respectively, $p=0.72$).

Conclusion : VM may be performed at lower efforts for BRS estimation. Non engagement of regulatory mechanisms at lower efforts probably result in atypical phasic response to VM. However this does not influence BRS. We recommend performance of VM at 30 mm Hg effort for 15 seconds in patients who cannot perform VM at 40 mm Hg effort.

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P/ CVS/25

Correlation of High and Low Basal Heart Rate with Heart Rate Variability in Young Healthy Males

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Background: Heart rate variability (HRV), the non-invasive method for assessment of changes in heart dynamics are reported to vary in response to different pathological conditions. However, it may also reflect variations in the basal physiological parameters of healthy individuals.

Objective: Aim of the study was to determine whether HRV is correlated with basal heart rate in young normal males.

Materials & Methods: A resting artifact free ECG recording in lead II was obtained in healthy young males, for at least 10 minutes with HR ranging from 60 to 90 bpm and was subdivided into three groups, representing Low-HR (61-70 bpm), Medium-HR (71-80 bpm) and High-HR (81-90 bpm). Thereafter, Time and frequency domain analysis of HRV was done.

Results: RMSSD was found significantly higher ($p=0.04$) in Low-HR when compared to Medium-HR, however pNN50 did not differ significantly in any of the groups. LF showed progressive increase ($p<0.05$) while HF ($p<0.05$) and LF/HF ratio showed progressive decrease (0.85 ± 0.35 , 0.5 ± 0.10 and 0.34 ± 0.15 , $p<0.05$) from Low-HR to High-HR group respectively. High correlation was observed between HR and RMSSD, as well as pNN50 ($r=0.5$, $r=0.6$)

in Low-HR group. Also LF, HF and LF/HF ratio showed high correlation ($r=0.6$, $r=0.9$, $r=0.7$) with High-HR group.

Conclusion: High-HR is correlated significantly with measures of frequency domain of HRV, while sympathovagal balance (suggested by LF/HF ratio) shows decrease with increase in HR even in healthy young males. Also, a significant correlation of LOW HR with time domain measures suggests a parasympathetic dominance in these individuals.

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P/ CVS/26

Comparison of Cardiovascular Reactivity to Cold Pressor Task in Indian Children from Different Economic Backgrounds

INDU SAXENA, MANOJ KUMAR

Background: The incidence of hypertension is increasing, while the age of onset of hypertension is decreasing in India, due to lifestyle changes caused by rapid urbanization. Future hypertension has been successfully predicted from the changes in pulse and blood pressure (cardiovascular reactivity, CVR) accompanying cold pressor task (CPT).

Objective: To compare the resting heart rate and blood pressure, and cardiovascular reactivity to cold pressor task in children belonging to different economic backgrounds, to identify children at risk of developing future hypertension.

Materials and Methods: A total of 297 children (130 female) of age group 6-16 year belonging to different economic backgrounds were selected for this study. Resting heart rate and blood pressure were measured. CPT (of one minute duration in a water bath maintained at 2-4°C) was performed on each child. Changes in heart rate and blood pressure were recorded.

Results: Although the mean values of resting systolic and diastolic blood pressure were lower in children from economically weaker families, the number of pre-hypertensive and hypertensive individuals was more (9) in this group, compared to the children from affluent families (5). The average increase in systolic and diastolic blood pressure was lower in children from affluent families.

Conclusion: Children from economically weaker families are apparently more at risk of developing future hypertension. A larger study with more subjects is required to confirm our findings.

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Exercise : Obesity and Blood Pressure

VANDANA B DUDHMAL

Background : Obesity results from energy imbalance : too many calories in, too few calories burned. A number of factors influence how many calories people burn each day, age, body size and genes. But the most variable factor – and the most easily modified is the amount of activity people get each day.

An abdominal obesity is now known to be a risk factor for coronary heart disease. Recent studies have demonstrated that obesity defined as body mass index of 30 kg / m^2 Or higher is associated with exponential increase of cardiovascular complications. Recently, there is growing evidence that the occurrence of most complications of obesity depends not only on the degree of overweight but also on the pattern of body fat distribution. An abdominal, upper-body type of fat distribution which can be easily determined by the measurement of waist and hip circumferences (waist-hip ratio-WHR) is also a confirmed risk factor for metabolic disturbances, hypertension and atherosclerosis, independent of body weight.

Exercise can lower the risk of heart disease, diabetes, stroke, high blood pressure. Despite all the health benefits of exercises, people worldwide are doing of it. The current study was undertaken to see the effect of exercise on blood pressure and Waist Hip Ratio and to compare the effect with similar studies.

Material and Methods : Women belonging to various age groups (25-45 years) were studied. Arm circumference, Chest circumference, WHR, Body Mass Index (BMI) and supine blood pressure (Systolic and diastolic) were recorded before and after 16 Wks, Exercise training.

Results : It was observed that arm circumference, chest circumferences, BMI, WHR, systolic blood pressure and diastolic blood pressure decreased with training (16 Wks).

Conclusion : From this it may be concluded that a short-term exercise intervention can induce favorable changes in the body composition, but the magnitude of these changes is of limited biological significance.

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Fast tempo song increases the heart rate and systolic BP of young adults

V MANIBALAN GUNASEKARAN RAMANATHAN

Background : Previous study reveals that music has physiological effect on cardiovascular system; it has been shown that fast tempo music increase the heart rate slow tempo song has opposite effect

Objective : The purpose of the present study was to find whether the different type of tempo song have affect on heart rate (HR), pulse rate (PR) and systolic BP of young medical students.

Materials and methods : Healthy 30 medical students with normal BMI, age 19-21 years, both sexes were selected. In four different stages their HR, PR and systolic BP were measured 1) Baseline (without any stimulus) 2) before exercise (songs played) 3) after 5-6 min exercise using Bi-cycle Ergo meter (no song played) 4) after exercise. Slow tempo 60-70 beats/ min, medium 80-90 beats/ min and fast tempo 120-140 beats / min songs were played (2.5-3 min) with a resting period of 2-3 min between one tempo to another tempo song.

Results : This study showed that the fast tempo songs significantly ($P < 0.005$) increases the HR, PR and systolic BP when compare to baseline or slow and medium tempo songs

Conclusion : This study conclude that fast tempo song has good effect on HR and systolic BP

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Feasibility Issues During Bedside Evaluation of Autonomic Function Testing in Non-Ambulatory Patient

SARITHA PANGA, SHIVANGI, KAVITA YADAV, DINU S CHANDRAN, ASHOK K JARYAL, KISHOR KUMAR DEEPAK

Background: Ewing™'s battery has been described as bedside test in several books. Considering non-availability of equipment/devices in India this still poses a problem of assessing AFT tests in non-ambulatory patients. Our lab receives requests from ward/ICU to perform bedside AFT testing. We have been accomplishing this objective for several years. This abstract illustrate one such case.

Objective: To illustrate the feasibility issues in conducting bedside AFT testing in non-ambulatory patients

Material and Methods: A 69 years old female non-ambulatory diabetic neuropathy patient who was unable to walk was referred from neurology department for autonomic function testing. A portable digital recording system was used to record AFT testing in bedside patients. We tried to record DBT(deep breath testing), CPT(cold pressor test), HGT(Hand Grip test), HUT(head up tilt),

and also measured HRV. We found it difficult to perform HUT in ward as the tilting/lying-to-standing was not possible. Then we tried to raise the head end of the bed alone in 15sec for 45o.

Results: We observed significant fall in BP after raising head end of the bed alone. Also found severe loss of sympathetic reactivity using changes recorded during CPT and HGT. The patient was unable to perform DBT.

Conclusion: Our attempt of using raising the head end of bed alone instead of HUT also showed significant fall in BP in several cases. Our this experience shows that there is a requirement of simple alternative methods by using available resources in wards/ICUâ€™s to perform AFT tests in bedside patients. There is a need to design and develop a portable device for performing Ewingâ€™s battery along with autonomic tone measurement.

P3. Endocrinology and Reproduction

P/ ER/1

Variations in Pattern Reversal Visual Evoked Potentials during Menstrual Cycle in Healthy Females

**SANGEETA GUPTA, GAURAV GUPTA,
SURJIT SINGH**

Background: Ovarian steroids have widespread effects throughout the central nervous system including the sensory information processing in the brain. For evaluating their effects on the visual system, visual evoked responses can provide valuable informations.

Objective : The present study was planned to record visual evoked potentials in healthy females in two different phases of menstrual cycle.

Material and Methods : Pattern reversal visual evoked potential (PRVEP) was recorded in 20 healthy females in the age group of 18-25 years, in the proliferative and in the luteal phases of menstrual cycle. Monocular stimulation was done and individual eye tested separately. P100 latency and N75-P100 amplitude were studied. Statistical analysis was done by paired t-test.

Results : Mean P100 PRVEP latency was shorter in the proliferative phase with a statistically significant difference ($p<0.0001$) as compared to that in luteal phase. There was a minimal increase in N75-P100 amplitude in the luteal phase which was not found to be statistically significant.

Conclusion : Ovarian hormones seem to affect the PRVEP waveforms. The significant reduction of mean VEP latency in the proliferative phase when estrogen levels are higher

can be attributed to the facilitating effects of estrogen on the neural transmission in the optic pathways.

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P/ ER/2

Serum Free Thyroxine (FT4) level Relationship during Different Trimesters in Normal Pregnant Women in Manipur, India

**SUMIT KUMAR, M RAMESWAR SINGH,
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Background : Pregnancy is associated with significant but reversible changes in the thyroid function as early as the first trimester of pregnancy. Gestation-related reference intervals for thyroid function tests (TFT) are significantly different from non-pregnant normal reference intervals.

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

Material and Methods : In this cross sectional comparative study, a total of 59 healthy pregnant women in different trimesters attending Obstetrics out patient department (OPD) of the RIMS hospital for antenatal check-up were consecutively selected. Serum levels of FT3, FT4 and TSH in different trimesters were estimated by ELISA method and results were analyzed by SPSS version 21 software.

Results : Mean TSH levels in the first, second and third trimester of normal pregnancy were found to be 1.79 ± 0.77 , 1.93 ± 0.99 and 2.14 ± 0.98 mIU/ml respectively. Mean FT3 levels in the first, second and third trimester of normal pregnancy were 2.56 ± 0.56 , 2.77 ± 0.51 and 2.05 ± 0.71 pg/ml respectively. Mean FT4 levels in the first, second and third trimester were 1.32 ± 0.26 , 1.02 ± 0.16 and 0.90 ± 0.25 ng/dl respectively. The study suggests that the serum FT4 level is gradually reduced from first to second trimester ($P<0.05$). However, mean TSH and FT3 levels showed no statistically significant difference between different trimesters.

Conclusion : The thyroid function tests in pregnancy should be interpreted against gestational age-related reference intervals to avoid misinterpretation of thyroid function during pregnancy.

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P/ER/3

Study of Relation Between Type 2 Diabetes Mellitus and Blood Groups

NANDITA M N, R H TAKLIKAR

Background : Diabetes once regarded as a single disease entity, is now seen as heterogeneous group of diseases, characterised by a state of chronic hyperglycaemia resulting from a diversity of aetiologies, environmental, genetic, acting jointly. The population in India has an increased susceptibility to diabetes mellitus with an estimated of 37.7 million cases. During past few years researchers have been trying to find out association of certain disease with particular blood groups. ABO blood groups are known to be associated with various disorders, with one blood group more often seen with patients of particular disease. The present study determines the relation between type 2 diabetes mellitus and ABO blood groups, Rh system.

Objective : Relation of type 2 diabetes mellitus and blood groups.

Materials and methods : A cross sectional study was done on 300 confirmed cases of diabetes mellitus who came for follow up to Navodaya medical college and hospital, Raichur. ABO blood groups were determined by Slide haem-agglutination test. Statistical analysis was done using Chi square test, frequency and percentage were determined.

Results : It was observed that the frequency of Blood groups in diabetes was in order of O > A > B > AB, it was not statistically significant ($P > 0.05$).

Conclusion : We conclude there is no relation between type 2 diabetes mellitus and blood groups.

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P/ER/4

Comparison of Electrocardiogram Changes in Second Trimester of Pregnancy with and without Anaemia.

PADMAJA T SUMANGALA, M PATIL,
NEERJA SHATRI

Background: Globally anaemia is the most common disease and in developing country like India iron deficiency anaemia predominates. Maternal heart disease is the most important non obstetric cause of death in pregnant women. Electrocardiogram is one of the important & simplest tools for the diagnosis of heart diseases. However, the changes in the myocardial function during pregnancy with anaemia

studies are few in India. Hence in the present study we hypothesised to know the effect of anaemia in second trimester of pregnancy on electrocardiography.

Objectives: To study & Compare the effect of anaemia on myocardial function by ECG in normal pregnant women in 2nd trimester & pregnant women with anaemia in 2nd trimester.

Materials and Methods: The study was conducted at antenatal OPD of Prathima Institute of Medical sciences hospital between Oct 2014 to Jul 2015. 100 pregnant women were selected for this study & divided in to 2 groups. 50 normal pregnant women (control group) in 2nd trimester (10-14 weeks of gestation) were compared with equal number of pregnant women with anaemia (study group) in 2nd trimester, aged between 20-30 years. Electrocardiogram was recorded using Philips twelve channel ECG machine model TC20 in both control & study groups. Haematological parameters were analysed by SYSMEX auto analyser. Subjects attending antenatal Out-Patient Department diagnosed as anaemia in whom, there was $Hb < 9\text{gm}\%$ were randomly included in the study. Analysis of Variance (One way ANOVA) was used for comparison between study and control groups and the data was analysed by t tests.

Results: The ECG changes observed in our study include significant decrease in QRS duration, increase in QTc in study group ($p < 0.05$) and T-wave abnormalities like flat and negative T-waves in lead II, III, avF, V2 – V4 were more frequent in study group ($p < 0.05$) than in control group. More percentage of patients having tachycardia and ECG abnormalities with decreased Hb level. There was a negative correlation between Hb level and tachycardia and ECG abnormalities.

Conclusions: Pregnancy with anaemia brings about various changes in ECG, suggests that anaemia and volume overload in pregnancy is a risk factor that may lead to cardiac hypertrophy. ECG recovery can be achieved with anaemia correction.

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P/ER/5

A Prospective Study on Thyroid Hormone Levels in ALD Patients Attending KIMS Hospital, Hubballi

SNEHA NANDRE, SHIVKUMAR J

Background : Alcohol consumption is well entrenched in the social fabric of many adult population, virtually constituting a behavioral norm. It is legal, readily available and cheap. Sustained excessive alcohol consumption is a brain-centered addictive behavioral disorder that crosses all

boundaries of gender, race, age, economic strata and in many patients might lead to Alcoholic Liver Diseases(ALD). ALD has known cause but is a complex process. It affects most of the organs in our body. On this ALDs various studies have been done .It is observed that not many Indian studies on thyroid hormone functional studies in case of alcoholic liver diseases are available. The study of thyroid function tests will throw a light on the functional aspects of liver diseases & gives some better understanding of the ALD & their interrelationship with thyroid function and thus helps in the management of ALDs

Objective : To study thyroid function tests in patients with ALD

Material and Methods : This prospective study consists of 30 ALD patients attending KIMS, hospital Hubballi having no history of diseases like DM, hypertension, non alcoholic liver diseases, renal diseases, thyroid disorders. 30 healthy males with no history of alcohol consumption are taken as controls. Serum T3, T4 and TSH levels in both the groups are studied and compared

Results : The serum concentrations of thyroid hormones showed the mean serum Total T4 and T3 were lower than the normal. The mean serum TSH is increased.

Conclusion : Though the ALD patients are clinically euthyroid, show significant abnormality in thyroid functions, appear to parallel the severity of liver dysfunction.

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P/ ER/6

Association Of Body Mass Index with Serum Testosterone in Polycystic Ovarian Syndrome Women of Reproductive Age Group

KANGKANA DUTTA PHUKAN, BONTI BORA

Background : Polycystic ovary syndrome (PCOS) is a heterogenous, multifactorial endocrinopathy in woman of reproductive age characterised with the ovarian expression of various metabolic disturbances, mainly characterise by anovulation, hyperandrogenism and/or polycystic ovary morphology.

Objectives: 1) To assess the relation between BMI and serum testosterone in PCOS women.

2) To correlate BMI and serum testosterone in women with PCOS.

Materials and methods : The study was carried out in 100 women diagnosed as having PCOS (according to

Rotterdam ESHRE/ASRM PCOS group's revised 2003 criteria) in the reproductive age group (15-44 yrs) .

BMI was calculated using the formula = wt in kg / height in m². On the basis of BMI(kg/m²), those 100 PCOS women were divided into two categories, viz 1) Lean PCOS, whose BMI < 23 and 2) Obese PCOS, having the BMI ≥ 23.

Serum testosterone was measured by using the Enzyme linked Fluorescent Assay technique

Results : The result showed that serum testosterone level is increased than the normal range(0.1-0.9 ng/ml) in both the lean and obese PCOS group with the mean and standard deviation being 1.44± 0.54 and 1.62 ± 0.47 respectively. However when the values were compared between the two groups by student's unpaired t test, it showed a p value of >0.05. Correlation of BMI with the Serum Testosterone using Pearson's correlation coefficient (r), calculates the value of 'r' between the two parameters as 0.096 (negligible correlation)

Conclusion : Serum testosterone is increased in women with PCOS irrespective of the BMI with no significant correlation .

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P/ ER/7

Relationship between Intra-Abdominal Fat and Ovulation in Obese Polycystic Ovarian Syndrome Patient

**MADHURI PANIGRAHI, SANTOSH PANDA,
SHILALIPI PRADHAN,
ANSHUMAN PATTANAİK, KARUNA DASH**

Background : It is seen that some obese anovulatory polycystic ovarian syndrome(PCOS) patients resume ovulation after significant loss of body weight.

Objectives : To compare the changes in body fat distribution specifically intra abdominal fat after lifestyle modification programme in patient of PCOS with obesity and resumptions of ovulation.

Material and Methods : In the study 60 anovulatory obese PCOS patients underwent lifestyle modification programme for six months and then assessed for intra-abdominal fat(IAF) by abdominal C.T. scan and ovulation detection by ovulation detection kit and trans-vaginal ultrasound after six months.

Results: In 60 anovulatory patients of PCOS it is seen that 42 women resumed ovulation after early and consistent loss of IAF as compared to the 18 women who did not show any significant weight loss during the study period.

Conclusion : In this study it was found that anovulatory PCOS women who resumed ovulation lost more body weight specifically IAF and resumed ovulation at the end of six months.

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P/ ER/8

A study on the Prevalence of Anemia in Diabetes

PRAMOD KUMAR, ARUNIMA DATTA, MANISHA MANDAL , KAMAKHYA KUMAR, SUREKHA DE, KALI CHARAN ROY, ARUP BANDYOPADHYAY

Background : Anemia is one of the world's most common preventable conditions or disease states; yet it is often overlooked, especially in people with diabetes mellitus (DM). The complications of DM are ubiquitous involving all organs, but not much importance is given, in regard to anemia in DM. That is why we have ventured to study the prevalence of anemia in DM in our semi-urban and rural based underdeveloped locality in Bihar.

Objective : "To study complete hemogram among Diabetic and normal persons. To compare the data obtained

Materials and methods : From our medical OPD the clinical data of 37 patients were obtained, all of whom were male diabetics of at least one year duration and aged between 18 and 60 years. 35 healthy non diabetic persons of the same age were also selected randomly. In all of them complete hemogram testing was done and the results of the two groups were compared statistically.

Results : Of the 37 diabetic patients, 27 patients were found to be anemic compared to only 7 out of 35 normal controls, proving that diabetic patients were more prone to anemia than their non- diabetic counter parts. The result was found to be statistically significance.

Conclusion : Our study has proved that within our limited set up and in small study in an underdeveloped rural background, diabetic patients were more prone to anemia. This finding is clinical important to detect and treat it early in order to prevent further complications.

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P/ ER/9

A comparison of salivary and blood glucose in type II diabetics in different age groups

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Background : To examine effects of age on salivary and blood glucose in type II diabetics and healthy adults.

Objectives : To estimate and study the effect of age on salivary and blood glucose levels in type II diabetics.

Material and Methods : 80 adults in age group of 30 - 50 years were included in the study and divided into 2 groups - diabetics and healthy adults. Both groups were further divided into 4 groups based on age (30-35, 36-40, 41-45, 46-50 years). Blood and saliva samples were obtained from subjects after overnight fast and 2 hours postprandial. Blood samples were analysed with hexokinase enzyme (automated analyser) and saliva samples with glucose oxidase enzyme (colorimeter). Salivary glucose levels were compared between diabetics and healthy adults by t-test. Relationship between salivary and blood glucose was assessed by correlation test. Difference in salivary and blood glucose levels between age groups was determined by Kruskal-Wallis test.

Results : Salivary glucose is significantly higher in diabetics ($P < 0.001$). Correlation between salivary and blood glucose is not seen. Blood glucose is highest in 36-40 years and salivary glucose in 46-50 years age group.

Conclusion : Salivary glucose levels are significantly higher in diabetics. There is a temporal shift in the age of diagnosis of diabetes. Further studies will help in use of salivary diagnostics for early and non-invasive diagnosis of diabetes.

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P/ ER/10

Iodine Supplementation Decreases Hypercholesterolemia in Iodine-Deficient, Overweight Women

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Background : In iodine deficiency, thyrotropin (TSH) may increase to stimulate thyroidal iodine uptake. In iodine-sufficient populations, higher TSH predicts higher total cholesterol. Whether higher TSH caused by iodine deficiency affects serum lipids is uncertain.

Objectives : Our aim was to determine if iodine repletion decreases serum TSH and improves the lipid profile.

Material and Methods : In this randomized controlled intervention, iodine-deficient, overweight or obese Moroccan women ($n = 163$) received 200 μ g oral iodine or a placebo daily for 6 mo. Main outcomes were serum TSH and plasma total and LDL cholesterol. Secondary outcomes included thyroid hormones and measures of lipid and glucose metabolism and urinary iodine concentration

(UIC). Data were compared by using mixed-model analysis.

Results : In the intervention group, median UIC increased from 38 (95% CI: 34, 45) $\mu\text{g/L}$ to 77 (95% CI: 59, 89) $\mu\text{g/L}$ ($P < 0.001$). After 6 mo of intervention, TSH was 33% lower in the treatment group than in the placebo group ($P = 0.024$). The triiodothyronine (T3) to thyroxine (T4) ratio and thyroglobulin decreased with treatment [-15% ($P = 0.002$) and -32% ($P < 0.001$), respectively], whereas T4 concentrations were higher in the treatment group ($P < 0.001$). Total cholesterol in subjects with elevated baseline cholesterol ($>5 \text{ mmol/L}$) was reduced by 11% after the intervention ($P = 0.034$). At 6 mo, only 21.5% of treated women remained hypercholesterolemic (total cholesterol $>5 \text{ mmol/L}$) vs. 34.8% of controls (baseline: 44.2% in the intervention and 36.8% in the control group; $P = 0.015$). The reduction in the prevalence of elevated LDL cholesterol ($>3 \text{ mmol/L}$) in the intervention group (50.6% to 35.4% compared with 47.4% to 44.9% in the control group) was not significant (P -interaction = 0.23).

Conclusion : Our findings suggest that moderate to severe iodine deficiency in overweight women elevates serum TSH and produces a more atherogenic lipid profile and that iodine supplementation in this group reduces the prevalence of hypercholesterolemia. Thus, iodine prophylaxis may reduce cardiovascular disease risk in overweight adults. This trial was registered at clinicaltrials.gov as NCT01985204.

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P/ ER/11

LDL-C Play Significant Role in the Progression of Diabetic Retinopathy (NPDR to PDR)

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Background : Persistent exposure to hyperglycemia and dyslipidemia in diabetics without proper management, can lead to numerous short-term and long-term complications, both of micro and macrovascular nature, which are the main cause of morbidity and mortality in diabetes. DR remains one of the most prevalent cause of morbidity in diabetic patient. "

Objectives : To see the correlation of dyslipidemia with diabetic retinopathy.

Materials and methods : 200 subjects were enrolled after ophthalmoscopic examination, into study group of Diabetic Retinopathy (n=100) and control group of No-retinopathy (n=100) respectively, on the basis of presence or absence of

retinopathy. Study Group was further divided into NPDR (n=50) and PDR (n=50). Whereas Control Group was divided into Diabetics NR (n=50) and Non-Diabetics NR (n=50) respectively, based on presence or absence of diabetes. Fasting blood samples were collected of all subjects for the estimation of FBS, ALDR-2 and FLP."

Results : On comparing outcomes of NPDR& PDR, duration of diabetes ($p < 0.003$), LDL-C ($p < 0.0234$) was significantly associated in the progression of NPDR to PDR, but no significant difference was observed for ALDR-2 activity ($p = 0.20$), Hyperglycemia ($p = 0.47$). So, we can conclude that ALDR-2 activity and hyperglycemia does not contribute much in progression of DR, although it is significantly responsible in the establishment of DR.

Conclusion : Establishment of DR will certainly occur sooner or later initially as NPDR, because it is very difficult to maintain sustained euglycemia for years, and will further progress to PDR. It is necessary to manage PDR, because PDR ensues as blindness in diabetics. We can halt progression of NPDR to PDR easily by managing dyslipidemia.

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P/ ER/12

Correlation between Glycated Hemoglobin (HbA1c) Levels and Diabetic Nephropathy in Newly Diagnosed type 2 DM Patients

HANCHINAMANI GEETA B, V S BALAJOSHI

Background : The prevalence of diabetes continues to grow worldwide and is extremely pronounced in Asian countries especially in India thus called "Diabetes Capital of World. The estimated overall incidence rate of CKD and ESRD in India is currently 800 per million population (pmp) and 150-200 pmp respectively.

Objectives : To study the correlation between HbA1c levels and Diabetic Nephropathy in newly diagnosed Type 2 DM patients.

Material and Methods : The study was done on patients attending KIMS OPD, Hubballi. 20 newly diagnosed type 2 DM patients of age 40 to 50 years were taken up for the study. Detailed history and clinical examination was done. Venous blood was collected after 12 hours fasting into two test tubes; with no anticoagulant for fasting blood glucose (FPG) and with Ethylene Diamine Tetra Acetic Acid (EDTA) for HbA1C. Morning urine sample was collected in a container (without preservative) for analysis of creatinine and microalbumin.

Results : Of 20 patients, 14 were males and 6 females. 9 were found to have Diabetic nephropathy of which 6 had microalbuminuria and 3 macroalbuminuria. Mean FPG in patients with nephropathy was higher than those without nephropathy showing significant correlation ($p < 0.0001$). The mean HbA1c was found to be 8.6% in patients with nephropathy and 7.8% in others thus having significant correlation.

Conclusion : The mean HbA1c levels and Fasting Blood Glucose levels both show positive correlation with early onset Diabetic Nephropathy in newly diagnosed Type 2 DM patients.

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P/ ER/13

To study autonomic function status in subclinical hypothyroid patients

DIPAK HIRA, ANUJ CHAWLA

Background : Altered sympathetic and parasympathetic function is well documented in patients with hypothyroidism. Impaired cardiac autonomic function is associated with increased morbidity. However, there are limited studies on effects of subclinical hypothyroidism on sympathovagal function. Further, there is controversial evidence of the limb of ANS which is affected and the association of degree of involvement with severity of thyroid hypofunction.

Objective : The study was aimed at measuring cardiovascular autonomic functions in subclinical hypothyroid subjects and to find out the relationship between serum TSH levels and autonomic function status, if any.

Material and Methods : Serum T3, T4 and TSH levels were used to identify subclinical hypothyroid cases. Blood pressure and heart rate responses to a battery of autonomic function test (AFT) maneuvers were measured in 44 cases (F=25, M=19) in the age group of 20-55 years. AFT results were scored and analyzed in terms of sympathetic function, parasympathetic function and total score. Statistical analysis was done using the Chi-square test. TSH levels were correlated with AFT scores.

Results : 77% of the subjects studied showed abnormal autonomic function. Of these, abnormal sympathetic function was found in 68%, parasympathetic function in 43% and both sympathetic and parasympathetic function in 34% of patients. Serum TSH levels showed fair correlation with the degree of autonomic dysfunction ($r = 0.302$).

Conclusion : Subclinical hypothyroidism affects autonomic functions. Sympathetic function is affected more than parasympathetic function. Serum TSH levels show fair correlation with the degree of autonomic dysfunction.

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P/ ER/14

Comparative study of Pulmonary function test in Type2 Diabetes mellitus

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Background : Diabetes Mellitus still remains one of the foremost causes of morbidity and mortality in both the developing and developed nations . Diabetes Mellitus includes a heterogenous group of hyperglycemic disorders. The presence of extensive microvascular circulation and abundant connective tissue in lungs, raises the possibility that lung tissue could be a target organ in Type2 Diabetes Mellitus.

Objective : To study the effects of Type2 Diabetes Mellitus on Lung function tests.

Material and Methods : 80 male subjects, 40 Type 2 Diabetics-study group, 40 Healthy -controls selected from Vaishnavi Hospital, Hyderabad. Medspiror instrument was used to record lung functions . Following parameters were recorded: Forced vital Capacity (FVC), Forced Expiratory Volume in 1st second (FEV1), FEV1/FVC ratio, Forced Expiratory Flow in the middle half of FVC (FEF25-75%) and Peak Expiratory Flow Rate (PEF). Statistical analysis was done using unpaired t- test in windows stat 9.2 software.

Results : Study group showed statistically greater percentage reduction in FVC, FEV1, FEF 25-75% and PEF compared to control group.

Conclusion : From this study, Type 2 Diabetes Mellitus may be a causative factor for derangement in lung functions due to altered connective tissue, thickening of basal lamina of alveolar membrane and capillary endothelium. All these factors are leading to restrictive lung disorder, which exacerbate with increasing blood sugar levels and duration of Type2 Diabetes Mellitus. Therefore lung is considered as a TARGET ORGAN in Type 2 Diabetes.

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A Study of Relationship between Pregnancy Related Sleep Disturbance with Interleukin-6 and Tumor Necrosis Factor- α Level

ANSHUMAN PATTANAIK, MADHURI PANIGRAHI, SHILALIPI PRADHAN, ARPITA PRIYADARSHINI

Background : Throughout the gestational period pregnant women experience a profound disturbance in sleep cycle. Clinical studies had proved that there is a link between disturbance in sleep cycle and inflammatory markers. But evidences have shown that there is a link between inflammatory markers and pregnancy complications. It is seen that persistent sleep disruption can increase inflammation that appears to be long lasting.

Objectives : An evaluation has been done in this study to know the relationship between inflammatory markers and sleep disturbances in early, mid and late pregnancy.

Material and Methods : 38 pregnant women had been recruited for the study which were evaluated for the sleep disturbances by using Pittsburgh Sleep Quality Index (PSQI) and the inflammatory markers Interleukin 6(IL-6) and Tumor Necrosis Factor- α (TNF- α) were evaluated by various biochemical techniques.

Results : it was found that there is a great relationship between sleep disturbances found during different trimester of pregnancy and IL-6 level. But no significant relationship was found between sleep disturbances and TNF- α level.

Conclusion : We concluded that women with the worst sleep may be at the greatest risk of pregnancy complications given that similar increases in inflammation have been associated with pregnancy complications.

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Evaluation of Blink Reflex for Early Diagnosis of Neurological Dysfunction in Hypothyroid Patients

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Background : Hypothyroidism is associated with central and peripheral nervous system disturbances. It affects the CNS due to the impairment of the sensory pathways secondary to hormonal imbalances, causing segmental demyelination which affects the transmission of impulses

along the complex polysynaptic pathways which involves the pons and medulla.

Objective : Usefulness of blink reflex in early diagnosis of CNS dysfunction in newly diagnosed hypothyroid patients before the onset of treatment.

Materials and methods : Blink Reflex was measured using RMS EMG EP MK2 machine in 30 patients (serum TSH -10 mIU/L) and 30 healthy controls between 18 - 50 years of age.

Results : Early R1 ipsilateral responses and late R2 responses (ipsilateral R2i, contralateral R2c) responses were recorded to be prolonged in patients relative to the controls. Right eye (patients versus controls) values were: R1 msec 11.6 ± 1.6 vs. 9.6 ± 0.4 ; R2i msec 38.9 ± 3.7 vs. 33.3 ± 2.7 & R2c msec 36.3 ± 4.1 vs. 31.6 ± 3.5 [with $p < 0.0001$ in all] while Left eye (patients versus controls) values were: R1 msec 11.4 ± 1 vs. 9.7 ± 0.5 ; R2i msec 39.3 ± 5 vs. 33.4 ± 3.6 & R2c msec 36.5 ± 4.1 vs. 33 ± 3 [with $p < 0.0001$ in all]. Amplitude was found to be statistically insignificant for blink reflex.

Conclusion : Increased latency of blink reflex indicates impairment predominantly of the sensory pathways. These changes are further more altered in untreated patients in the advanced stage of the disease. Hence blink reflex is useful non-invasive tool for early detection of cranial neuropathy in newly diagnosed hypothyroid patients and to assess their response to treatment.

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Platelet Dysfunction in Pre-Eclamptic Mothers

PURNIMA MEHER, AKSHYA KUMAR MISHRA

Background : Pre-eclampsia is a pregnancy specific disorder characterized clinically by new onset hypertension having blood pressure $\geq 140/90$ mm Hg and proteinuria after 20 weeks of gestation. It is responsible for a high proportion of hospital admission, labour induction, maternal as well as fetal morbidity and mortality. But it is fortunate that with early detection and prompt management this disease can be ameliorated and eclampsia is prevented.

Objectives : To find out the changes in total platelet count, bleeding time and clotting time in pre-eclamptic pregnant women as compared to normal pregnant women.

Material and methods : This is a case control study. The study consisted of 60 pregnant women after 20 weeks of gestation. Out of these, 30 were normotensive and 30 were diagnosed case of pre-eclampsia. Patients having past history of hypertension, renal diseases, diabetes during non

pregnant state, drug administration altering hematological profile and autoimmune disorder were excluded from the study. Blood pressure measurement, bleeding time, clotting time and total platelet count were done for each case and control subjects.

Results : There was significant fall in TPC ($p<0.01$) but significant rise in BT, CT both ($p<0.01$) in pre-eclampsia as compared to normal pregnant women.

Conclusion : From this study we found that BT, CT and TPC can be used as a predictive test not only for disease process but also for fetal outcome. This can also help in timely diagnosis and treatment of severe pre-eclampsia causing maternal mortality.

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P/ ER/18

Esophageal Motility Dysfunction and Type 2 Diabetes Mellitus: Indian Scenario

**VIVEK VERMA, LATIKA MOHAN, SOUGAT RAY,
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Background : Diabetes Mellitus (DM) is a metabolic disorder which affects multiple systems of the body including Gastro-intestinal system. A number of researchers have studied effect of Type 2 DM on esophageal motility function test in western population, but there is no study on Indian population. A good control of blood sugar can delay and even prevent these adverse effects and long term complications.

Objective : Assessment of esophageal motility functions in type 2 DM and their correlation with duration of diabetes, blood sugar, HbA_{1C} and to explore the relationship among GI symptoms with abnormal esophageal motility findings.

Materials and methods : The study was conducted on 42 volunteer patients attending the medical OPD of tertiary care hospital for diabetes. Esophageal motility functions were assessed using 16 channel high resolution Gastrointestinal Manometry assembly. Blood sugar (f & PP) was measured by routine blood test, whereas Glycated hemoglobin (HbA_{1C}) was measured using HbA_{1C} meter.

Results : In the present study the mean duration of diabetes was 6.21 ± 4.55 yrs and the mean BMI of the patients was 25.80 ± 4.93 Kg/m². The mean HbA_{1C} was 7.86 ± 1.49 and 62% patients had HbA_{1C} values greater than 7%. Contractile Front velocity (CFV) was the main esophageal motility parameter which was affected in the diabetics. 26.19% patients had CFV more than 9cm/s. 26% patients had abnormal Basal Lower Oesophageal Sphinctor

Pressure (BLOSP) and 5% patient had raised peristaltic amplitude.

Conclusion : CFV and BLOSP were the main esophageal motility parameter which was affected in the diabetics. The association between GI symptoms and CFV was also significant. The duration of diabetes is negatively correlated with peristaltic amplitude, and HbA_{1C} values. DM may leads to subtle changes in esophageal motility which in turn may leads to GI symptoms in diabetics.

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P/ ER/19

A Study of Sympathetic Function during Different Phases of Menstrual Cycle in Young Healthy Girls

**APARAJITA CHAKRABORTY,
SHRABANI BARMAN, JYOTISMITA DEKA**

Background : Fluctuations in hormonal levels during menstrual cycle influence autonomic activities.

Objective : To study the autonomic sympathetic parameters during different phases of menstrual cycle .

Materials and methods : Thirty healthy eumenorrheic females in the age group of 17-24(20.2 ± 1.90) years were recruited in this study. Sympathetic non- invasive autonomic function tests performed were Isometric Handgrip Exercise test and postural challenge test . The tests were performed during the menstrual, follicular and luteal phases of menstrual cycle. Statistical analysis is done using ANOVA, paired t-test using SPSS 18.0 and MS Excel software.

Results : The resting blood pressure and the blood pressure variation recorded after postural challenge test and Isometric Handgrip Test were statistically significantly higher ($p<0.05$) in the luteal phase as compared to menstrual phase and follicular phase and also the blood pressure variations were significantly less ($p<0.05$) in the follicular phase as compared to menstrual phase and luteal phase.

Conclusion : Our study shows that sympathetic activity is highest during luteal phase and lowest in the follicular phase as compared to the menstrual phase. The higher sympathetic activity may be correlated with higher estrogen and progesterone levels during the luteal phase of menstrual cycle.

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Common Peroneal Nerve Conduction Studies in Prediabetics and Diabetics in North Indian Population

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Introduction: Diabetes mellitus (DM) is a metabolic disorder, of which the number of patients are rapidly increasing worldwide due to several conditions. Diabetic peripheral polyneuropathy (DPP), one of the common complications of DM, predisposes the patient to foot ulcers or amputation. Nerve conduction studies (NCS) are the most sensitive and reproducible measure of peripheral nerve functions. These can define and quantitate normal nerve activity. These tests examine the state of rapidly conducting myelinated fibres in a peripheral nerve. The motor nerve conduction velocity (MNCV) and motor latency (MNSL) of common peroneal nerve provides the highest diagnostic sensitivity.

Objective: Evaluation of common peroneal nerve conduction studies in prediabetic and diabetic to assess neuropathy.

Material and Methods: Our study is a observational cross sectional study. Examination of nerve conduction velocity, amplitude and latency was done in 79 subjects (16 prediabetic and 63 diabetics) by using Synergy machine Viasys at K.G's Medical College, Lucknow.

Results: Right and left common peroneal nerve amplitude [4.45±1.82 & 2.91±1.75] ; [4.53±1.6 & 2.63±1.7] and velocity [43.06±8.56 & 37.48±7.86] ; [42.53±5.65 & 36.73±6.44] were significantly lower in diabetics when compared to prediabetics but both nerve latency did not differed significantly.

Conclusion: Small detectable changes in nerve conduction are sensitive indicator of progressive nerve dysfunction and response to treatment even when lab tests are normal. Decreased nerve amplitude shows degeneration of nerve fibres and decreased common peroneal velocity shows decreased speed of nerve impulse in diabetics when compared to prediabetics. Thus, this nerve conduction study indicates progressive neuropathy in diabetics.

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The ECG Change in QRS complex- A Tool for Evaluation of Heart Disease in Asymptomatic Type II Diabetics.

AFTAB BEGUM, CHANDRASEKHARAPPA

Background : Diabetes mellitus (DM) is a group of metabolic disorders characterized by hyperglycemia. The chronic hyperglycemia of diabetes mellitus is associated with long term damage, dysfunction and failure of various organs especially the eyes, kidneys, nerves, heart, and blood vessels.

Objectives : The purpose of this study is, to detect & compare the electrocardiographic changes (QRS complex) in asymptomatic type II diabetics & controls.

Material and methods : Fifty type II DM cases aged between 30-55 years and fifty (50) age and sex matched controls were selected. Ethical clearance and informed consent was taken. A pretested structured proforma was used to record the relevant information from each individual case selected. The instrument used to record electrocardiogram is the twelve channel electrocardiograph HEWLETT PACKARD page writer. Unpaired t-test was used to compare the parameters between type II DM cases & controls. Level of significance was set at $p < 0.05$.

Results : There was statistically highly significant increase in duration of QRS complex among type II diabetics when compared to controls ($p < 0.001$).

Conclusion : The prolonged QRS complex can be considered as the evidence that the heart of diabetic patients is damaged by cardiomyopathy. Hence the screening of diabetics for electrocardiographic abnormalities is strongly recommended at the time of diagnosis for proper interventions & to prevent complications at the earliest.

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A comparative study of thyroid hormone status in reproductive period in case of female in the North Eastern region of India

BICHITRA KR. BORDOLOI, EVALYN SINGERPI

Objective : To study thyroid hormone status in reproductive period in case of female in the goiter endemic area in the North Eastern region of India.

Method : All together 100 cases with 63 numbers in various trimesters of pregnancy and the control group consisting of 37 women in different age groups 18-40 years were selected randomly. Under all aseptic care, 4 ml blood was collected by venepuncture with a disposable syringe from a subject and then transferred immediately after removing the needle to a sterile screw-cap glass/plastic test tube and allowed to clot undisturbed for an hour. After the blood has firmly clotted, the serum was then separated with pasture pipette and then it was transferred to a centrifuge crew cap tube and centrifuged for half an hour. Then the serum sample were then stored in a deep freezer at -20°C until the time of assay i.e. within 2 months. The serum assay for the thyroid hormones Total T3, T4 TSH was done by the method of Radio-immunoassay (RIA)

Result : T3 level showed an increasing trend from 1st to 3rd trimester of pregnancy. But there was a definite difference between the 1st and 3rd trimester, $t=3.531488$ ($p<0.01$). T4 level between 1st and 3rd and between 2nd and 3rd trimester showed definite difference of $t=3.840315$ ($p<0.01$) and $t=3.860765$ ($p<0.01$) respectively. TSH level comparison was $p<0.01$ between 1st & 2nd and between 1st & 3rd trimester, whereas there was not of much significant increased between 2nd and 3rd trimester. The overall thyroid hormone status in the 1st, 2nd, 3rd trimester was therefore of increased value as expected, but within the normal range. In the control group T3 level was raised in the secretory phases, $t=3.000024$ which was highly significant ($p<0.01$). T4 level was also significantly increased from proliferative to secretory phase, $t=5.263324$ ($p<0.01$). TSH level showed slightly lower mean \pm S.D. of 4.5958 ± 1.8351 into 3.4352 ± 1.9099 , $t=1.751665$ which did not indicate a significant changes. All were in Euthyroid status.

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P/ ER/23

A Study on Prevalence of Gestational Diabetes and Its Feto-maternal Outcome in a Medical College of Odisha

POONAM MEHTA, JYOSTNARANI PATNAIK

Background : Prevalence of gestational diabetes mellitus (GDM) is known to vary widely depending on the region of the country, dietary habits, socio-economic status. Women with GDM are at increased risk for adverse obstetric and perinatal outcome. Hence, this study was undertaken to determine the prevalence of GDM and its feto-maternal Outcome in a medical college of Odisha.

Objectives : The objective was to evaluate the prevalence of gestational diabetes and further assess its feto-maternal outcome

Material and methods : The study was conducted in 100 patients between 24 and 30 weeks of gestation, attending the antenatal clinic of Hi-tech medical college of Odisha.

They were given 75 g oral glucose and their plasma glucose was estimated at 2 hr. Patients with plasma glucose values >140 mg/dl were labeled as GDM and the rest as the control. Women already diagnosed and treated as GDM were also included as cases and treated as before till delivery. All GDM patients were followed up and treated with diet and/or insulin therapy till delivery to know maternal and fetal outcomes.

Results : The prevalence of GDM in this study was 15%. Maternal complications in the GDM group were gestational Hypertension, premature rupture of membrane and abruptio placentae, while macrosomia and hypoglycemia were commonest fetal complications.

Conclusion : The study highlights the importance of prevalence studies in different geographical regions of India to delineate the exact prevalence of GDM in the country. GDM is adversely affects maternal and fetal outcomes. Hence, early detection and treatment is necessary for better feto-maternal outcomes.

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P/ ER/24

Dyselectrolytaemia in Middle Aged Type II Diabetes Mellitus - “ A Harbinger of Cardiac Function Abnormalities”.

AFTAB BEGUM, CHANDRASEKHARAPPA S

Background : Diabetes mellitus (DM) is a chronic metabolic disorder. The management of blood glucose and other modifiable risk factor is a key element in the multifactorial approach to prevent complications of diabetes and decreasing the mortality and morbidity.

Objectives : To determine and compare the serum electrolyte (sodium & potassium) in asymptomatic type II diabetic cases and controls.

Material and methods : Fifty type II DM cases aged between 30-55 years and fifty age and sex matched controls were selected from general population. Detailed physical and systemic examination was done. Ethical clearance and informed consent was taken. Estimation of Serum electrolytes (Sodium and Potassium) was done by Ion selective electrode method. Unpaired t-test was used to compare the parameters between type II DM cases & controls by using SPSS version 16. Level of significance was set at $p<0.05$.

Results : There was statistically significant increase in Serum potassium level among type II diabetics when compared to controls ($p< 0.001$).

Conclusion : This altered distribution of serum potassium levels in diabetics could be due to hyperglycemia. Hence the screening tests such as estimation of serum electrolytes are strongly recommended at the time of diagnosis for proper interventions which could prevent the complications at an earlier date.

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P/ ER/25

Lipids in Health and Diabetic Females

PADMA RAMACHANDRAN

Background : Diabetes is a strong risk factor for cardiovascular disease (CVD).The relative role of various lipid measures in determining CVD risk in diabetic patients is still a subject of debate. We aimed to compare performance of different lipid measures as predictors of CVD using discrimination and fitting characteristics in individuals with and without diabetes mellitus. There was no difference in the discriminatory power of different lipid measures to predict incident CVD in the risk factor adjusted models, in either sex of diabetic and non-diabetic population.

In our previous study, glycosylated haemoglobin concentration is related to FBS,PPBS and mean blood sugar concentration during monitoring in hospital.

Objective Analyse the influence of lipid profile.Study the influence of lipid peroxidation and role of Tocopherols in cardiovascular disease.

Materials and methods We selected hundred patients and normal control.Standard methods were used to analyse lipid profile,lipid peroxidation,serum levels of Tocopherols and Cardiac enzymes.

Results & Conclusion There were significant increase in lipid peroxide and significant decrease in SOD and serum Tocopherols

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P/ ER/26

Comparative Study of body mass index (BMI) In Diabetic and Non diabetic Male Indian Population

ADVAIT PATIL, AMEET FADIA

Background : Diabetes Mellitus (DM) is common endocrine disorder. Its prevalence is increasing and BMI taken as independent risk factor for development of

diabetes. Indian population with high risk of diabetes and its co morbidity has substantial lower BMI than WHO cut off point for Asian populations varies from 26 to 31 kg/m²

Objective : To find out whether BMI cut-off points by WHO for determining over weight and obesity is applicable to Indian population or not.

Materials and methods : This study include two group diabetic (n30) and non-diabetic (n30) male individual between age group of 35 to 55 years old are taken from endocrine opd. Diabetic subject taken after confirmatory GTT and other investigation. Height and weight were measured for every individual and body mass index (BMI) was calculated. The observed values of the two groups were compared using Un-paired t-test.

Results : The mean \pm standard deviation value of BMI of non-diabetic and diabetic is 21.7+1.43 and 24.5+1.42 respectively. Present study was found to be statistically significant (p<0.0001) but BMI of diabetic subject is more significantly correlated with age than non-diabetic.

Conclusion : Study concluded that BMI cut-off points for determining over-weight and obesity should be lowered to 23 kg/m² or less which can provide an adequate basis of taking action on risks related to overweight and obesity to Indian population.

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P/ ER/27

Effect of Postprandial Hyperglycemia and Acute Exercise on Endothelial Function of Healthy Subjects

KIRAN PRAKASH, ANITA S MALHOTRA, NANDINI KAPOOR

Background : Endothelial dysfunction (ED) is the pivotal event for atherosclerosis and is the main contributor for cardiovascular diseases. Hyperglycemia has been reported to be associated with ED and exercise been proved to improve the endothelial function (EF). Present study was aimed to explore the effect of postprandial hyperglycemia and acute exercise on EF of healthy subjects.

Methods : 84 healthy subjects aged 18 to 30 years were evaluated for EF by flow-mediated dilation (FMD), at fasting and after first and second hour of glucose load (75g), along with blood glucose level estimation, on day-1. On day-2, subjects were asked to perform aerobic exercise for 15 min at the 70% of their maximum attainable heart rate (predicted VO₂ max), after 1.30 hr of glucose load; rest of the recordings carried out were same as done on day-1.

Results: There was significant decrease in first and second hour postprandial FMD as compared to the fasting FMD on day-1 (14.34 ± 6.671 % versus 17.56 ± 6.684 %; $P < 0.0001$; and 16.58 ± 6.893 % versus 17.56 ± 6.684 %; $P < 0.0001$ respectively). But, the second hour postprandial FMD of day-2 was found to be significantly increased as compared to same-day-fasting and second hour FMD values of day-1 (20.37 ± 7.838 % versus 17.58 ± 6.685 %; $P < 0.0001$; and 20.37 ± 7.838 % versus 16.58 ± 6.893 %; $P < 0.0001$ respectively).

Conclusion : Hyperglycemia attenuates EF. However, acute exercise significantly improves EF and can even nullify the attenuating effect of postprandial hyperglycemia on it.

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P/ ER/28

Relationship among BMI, Hyperglycemia, Peripheral Neuropathy in Rural Female Patient Attend in Peripheral Medical College

RABINDRANATH MAJUMDER, H.S.PATHAK, SWATI CHATTOPADHYAY (SINHA)

Background : With the advancement of age obesity and diabetic neuropathy continue to increase, moreover greater the BMI, greater the risk of neuropathy.

Objective : The aim of our study is to observe the relationship between diabetic neuropathy with BMI.

Materials and Methods : The study was conducted on 400 diabetic female patients age between 35-70 year in OPD of College of Medicine and JNM Hospital ,Kalyani. Out of 400 diabetic patients , 180 patients suffering for last 6 years or more and 220 patients suffering for less than 6 years. All the patients having history of hyperglycemia with high blood glucose report .The BMI measured using formula & peripheral neuropathy evaluated by the Biothesiometer .

Result : Out off 180 diabetic patients(suffer for >6 years) 68 patients with high BMI, 76 is normal and 36 with low BMI. 63 patients out of 68 suffer from neuropathic pain .46 patients with normal BMI suffer from neuropathic pain.

Out of 220 diabetic patients (suffer for<6 years) 76 patients having high BMI, 84 is normal and 60 with low BMI. 26 patients out of 76 (with high BMI) suffer from neuropathic pain. Only 18 patients out of 84 (with normal BMI) suffer from neuropathic pain. Patient with diabetic neuropathy reduced sensation and often strength in the lower extrimities .Incase of obese patients earlier diabetic neuropathy occurred in compared to patient with normal BMI.

Conclusion : Female diabetic neuropathy patients showed decrease static postural control along with diabetic sensory input.

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P/ ER/29

A Comparative Study of Anemia with the Degree of Glycemic Control Type II DM

UJJWALA JAGDALE

Background: Diabetes mellitus is a group of metabolic disorders characterized by hyperglycemia. This is associated with abnormalities in carbohydrate, fat and protein metabolism. Anaemia is a condition in which the haemoglobin concentration in blood is below the expected value, when age, gender, pregnancy and certain environmental factors, such as altitude, are taken into account. There are an increasing number of patients with diabetes who have been found to be anaemic without any evidence of any chronic renal disease. Anaemia may be more common in diabetes and develop earlier than in patients with renal impairment from other causes. In spite of the plethora of reports on the presence of anemia in diabetic patients with renal insufficiency, limited study exists on the incidence of anaemia in diabetics prior to the evidence of renal impairment. Hence I have taken up this study to find the incidence of anaemia in Type 2 diabetes mellitus patients.

Objectives : To compare the haemoglobin levels among controls and patients of type 2 diabetes. I am correlating the levels of haemoglobin with the degree of glycemic control ($HbA1c > 7$ g % vs. $HbA1c < 7$ g %). I also intend to detect the unrecognized cases of anaemia among type 2 diabetes mellitus patients.

Materials and Methods: The total sample size of the present study is 90 among which, 30 were healthy controls, 30 were better glycemic controlled T2DM patients ($HbA1c < 7$ g %) and 30 were poorly glycemic controlled T2DM patients ($HbA1c > 7$ g %). Institutional Ethical committee approval was sought. Written informed consent was obtained from the pated to the general subjects prior to study. A detailed history was taken from the subjects followed by a systemic clinical examination. Blood samples were collected from all the subjects for the estimation of Hb%, $HbA1c$, PPBS, Blood Urea, and Serum Creatinine. The values obtained after analysis was tabulated and statistical analysis was done to know the association. Urine and Stool samples were collected and analyzed.

Results: There was a significant decrease in the haemoglobin percentage in the diabetic group compared to the healthy controls. Among diabetics the better glycaemic control group had a significantly higher haemoglobin percentage. The Haemoglobin percentage among controls, better glycaemic control T2DM patients and Poor glycaemic control T2DM patients was 13.44 ± 1.38 , 12.27 ± 1.75 and 11.4 ± 1.81 respectively. The HbA1c percentage was 6.08 ± 0.23 , 6.64 ± 0.18 and 8.4 ± 1.21 respectively. 39 diabetic subjects in my study were having anaemia which was undetected which 65% of the total diabetic subjects. There was no significant difference with respect to age, demographic characteristics and renal profile (Blood Urea and Serum Creatinine) among the groups. There was a negative correlation between HbA1c and FBS with Hb% with Person's correlation coefficient being -0.4790.

Conclusion : The present study shows that Anaemia is a common finding which may go undetected in Diabetic patients comopulation. Further good glycaemic control in T2DM will lead to a better haemoglobin percentage in T2DM patients.

Key Words: Type 2 Diabetes Mellitus, Anaemia, Haemoglobin %, renal profile.

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P/ ER/30

Protein Carbonyl and Vitamin C in Seminal Plasma of Infertile Male

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Background : 'Oxidative Stress' is an imbalance between pro-oxidants (commonly Hydrogen peroxide, Peroxy Radical, Hydroxyl Radical, Superoxide anion, Nitric oxide etc.) and anti-oxidants (viz. Superoxide dismutase, Glutathione Peroxidase, Catalase, Vitamin C, E etc.). This condition is associated with an increased rate of cellular damage induced by O_2 and O_2 derived oxidants, commonly known as Reactive Oxygen Species (ROS). 25-40% of infertile male had high level of ROS in semen samples. In the present study, estimation of Protein Carbonyl (CO) groups as biomarker of oxidative stress was selected due to the relative early formation and the relative stability of the carbonylated proteins.

Objective : To study, seminal plasma Protein Carbonyl (ROS) and Vitamin C (anti-oxidant) levels in male fertile

and infertile subjects with respect to different seminal parameters.

Materials and Methods : Determination of Protein Carbonyl and Vit-C along with measurement of different seminal parameters was performed by using standard validated methods.

Results: In Pearson correlation of the Control Group (N=56), we observed a positive correlation of SC (80.67 ± 25.61 million/ml) with Vitamin C (1.142 ± 0.89 mg/ml) ($r=0.450, p<0.001$) while a negative correlation with PC (1.40 ± 1.59 nmol /mg of total Protein) ($r=0.396, p<0.01$). In the Case group (N=68), it was found that SC (58.21 ± 40.28 million/ml) is positively correlated with Vit C (0.7682 ± 0.51 mg/ml) ($r=0.320, p<0.01$), but negatively correlated with PC (2.37 ± 1.39 nmol/mg of total Protein) ($r=0.368, p<0.01$). We found that there was a statistical significant difference between PC ($t=3.602, p<0.01$) and Vit C ($t=-2.919, p<0.01$) by doing independent sample 't' test.

Conclusion: Thus evaluation of oxidative status may aid the clinician in further management of male infertility.

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P4. Gastrointestinal and Renal Physiology

P/ GIT/1

Grading of Non Alcoholic Fatty Liver in Relation to BMI and Laboratory Parameters

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EQBAL ANWER, NITIN PANDEY, DILSHAD ALI**

Background : Non alcoholic fatty liver disease (NAFLD) encompasses a spectrum of hepatic pathology ranging from simple steatosis(also called as non alcoholic fatty liver) in most benign form to cirrhosis in its most advanced form. Non alcoholic fatty liver disease is now recognised as most common liver disease in united states, with a prevalence of approximately 5% in general population and upto 25% to 75% in patients with obesity and type II diabetes mellitus. However prevalence in general Indian population varies from 9% to 32%.

Objectives : This study aimed to evaluate the ultrasonographic grading of non alcoholic fatty liver in relation to BMI and other laboratory parameters.

Material and Methods : This was an observational study conducted in department of physiology in collaboration

with department of Medicine and Radiology of Era's Lucknow Medical College and Hospital. In this study, 25 patients having NAFLD on their abdominal sonogram were selected and following laboratory tests were performed: ALT, AST, RBS, Triglyceride and Cholesterol levels, Hepatitis B surface antigen, Hepatitis C antibody. Ultrasonography grading of non alcoholic fatty liver were compared with above mentioned laboratory parameters and BMI using SPSS(version 16.0) software.

Results : Among the various parameters, only BMI and Triglycerides had statistically significant association with Ultrasonographic grading of non alcoholic fatty liver.

Conclusion : Preliminary data shows that increase in Ultrasonographic grading of non alcoholic fatty liver is directly related to increase in levels of Triglycerides and BMI.

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P/ GIT/2

Mechanisms of Contractility in Normal Vermiform Appendix

A K TIWARI, P B SINGH, S P BASU, A GHOSH KAR

Background : Alteration in appendicular peristalsis has been suspected as a precipitating factor in appendicitis. But, till date contractility of the appendix has not been studied in detail. Further, the mechanisms involved in the contractility of normal human vermiform appendix are not well understood.

Objectives : Present study is undertaken to investigate the underlying mechanisms involved in mediating the contractility of longitudinal muscles of normal human vermiform appendix.

Materials and Methods : Contractility of the longitudinal muscle strips of normal human vermiform appendix was recorded in each experiment against initial tension of 500 mg using Dale's organ bath and Statham's isometric force displacement transducer with Kreb's ringer solution (continuously bubbled with 100% O₂ and at 37 ± 0.5°C). Resting tension thus recorded were considered as control. Further, contractions were recorded separately for each agonists such as acetylcholine, serotonin and histamine before and after exposure to appropriate antagonists like atropine, ondansetron and chlorpheniramine maleate respectively. Comparison were made after normalization with control response between the contractions obtained after exposure to appropriate antagonist and with before values and a p < 0.05 was considered significant.

Results : Acetylcholine (10 µM) produced maximum amplitude of contractions (4.28 ± 0.97 g / g muscle) and these were significantly blocked (p < 0.05) by prior

exposure of the muscle strip to atropine (100 µM). Serotonin (1 µM) produced maximum amplitude of contractions (4.47 ± 1.01 g / g muscle) and these were also significantly blocked (p < 0.05) by serotonergic 5HT₃ antagonist ondansetron (10 µM). Histamine (1 µM) produced maximum contractions (0.34 ± 0.15 g / g muscle) and these were significantly blocked (p < 0.05) by prior exposure of the muscle strip to chlorpheniramine maleate (100 µM).

Conclusion : The present study suggests the involvement of cholinergic, serotonergic (5HT₃) and histaminergic (H₁) pathways in mediating the contractility in longitudinal muscle of normal human vermiform appendix. However, role of other mechanisms needs further investigations.

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P/ GIT/3

Mechanisms of Contractility in Inflamed Human Vermiform Appendix

**P B SINGH, S P BASU, A GHOSH KAR,
A K TIWARI**

Background : Appendicitis is a known cause of health concern to men, women and children worldwide. Histopathological studies of appendicitis revealed ultra-structural damages to neurons and Interstitial cell of Cajal networks. These observations suggest alteration in contractility in appendicitis. However, mechanisms involved in the contractility of inflamed appendix are not clear.

Objective : Present study is undertaken to investigate the mechanisms mediating contractility of longitudinal muscles of inflamed vermiform appendix.

Materials and methods : In vitro contractility of the longitudinal muscle strips of inflamed appendix were recorded in each experiment against initial tension of 500 mg in Dale's organ bath using Statham's isometric force displacement transducer with Kreb's ringer solution (continuously bubbled with 100% O₂ and maintaining temperature at 37 ± 0.5°C). These contractions were considered as control. Further, contractions were recorded in the separate group of experiments with agonists such as acetylcholine, histamine and serotonin before and after exposure to appropriate antagonists like atropine, chlorpheniramine maleate and ondansetron respectively. Contractions obtained after exposure to antagonist were compared with before values and a p < 0.05 was considered significant.

Results : Acetylcholine (10 µM) produced maximum amplitude of contractions (3.25 ± 2.37 g / g muscle). The magnitude of contractions elicited by acetylcholine (10 µM) after exposure to atropine (100 µM) were not

significantly different ($p > 0.05$) from before values. Further, in another series of experiments, histamine ($10 \text{ } \hat{\mu}\text{M}$) produced maximum amplitude of contractions ($0.27 \hat{\pm} 0.12 \text{ g / g muscle}$) and these contractions were significantly blocked ($p < 0.05$) by histaminergic H1 antagonist chlorpheniramine maleate ($100 \text{ } \hat{\mu}\text{M}$). In a separate series of experiments, serotonin ($1 \text{ } \hat{\mu}\text{M}$) produced maximum amplitude of contractions ($3.25 \hat{\pm} 0.60 \text{ g / g muscle}$) and these contractions were also significantly blocked ($p < 0.05$) by serotonergic 5HT3 antagonist ondansetron ($10 \text{ } \hat{\mu}\text{M}$).

Conclusion : The present investigation suggests the involvement of histaminergic (H1) and serotonergic (5HT3) pathways in mediating the contractions in longitudinal muscle of inflamed appendix.

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P/R/1

Estimated Glomerular Filtration Rate in Patients with Type 2 Diabetes Mellitus

NIDHI YADAV, ANJALI SHETE

Background : Diabetic patients are at an increased risk of developing specific complications like nephropathy, retinopathy, neuropathy and atherosclerosis. Diabetic nephropathy occurs in approximately one third of type 2 diabetics. Diabetic nephropathy is a leading cause of end stage renal damage, characterized by decreased glomerular filtration rate and proteinuria. The morbidity and mortality caused by diabetes mellitus can be reduced by regular screening, early detection and appropriate treatment of chronic complications.

Objective : To estimate glomerular filtration rate using Modification of Diet in Renal Disease (MDRD) equation that include serum creatinine for the screening of reduced renal function or as predictor of early renal damage in type 2 diabetes mellitus.

Material and Methods : Total 60 subjects were included in the study group. 30 were non diabetic subjects and 30 were known cases of type 2 diabetes mellitus patients of age 30- 60 years with duration of 5-10 years. Laboratory investigations done were fasting blood sugar, serum creatinine and estimated glomerular filtration rate (eGFR). eGFR is estimated according to MDRD equation available on website of National Kidney Foundation.

Results : The mean \pm standard deviation of eGFR estimated by MDRD equation was compared between diabetics ($63.19 \pm 26.49 \text{ ml/min}$) and non diabetics ($95.46 \pm 19.56 \text{ ml/min}$). Values were found significantly decreased in diabetic patients.

Conclusion : Serum creatinine was used to estimate eGFR in diabetic patients and the eGFR was decreased in diabetic patients. Thus, the routine serum creatinine and eGFR investigation can be used as an early predictor of diabetic nephropathy.

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P5. Hematology

P/ H/1

Correlational Study between Anthropometric Measurements and Hematological Parameters in Young Adults

MEHNAAZ SAMEERA, ARIFUDDIN MOHAMMED, ABDUL HANNAN HAZARI

Background : Anthropometric parameters are frequently used as a marker for nutritional status assessment. Risk of mortality in seriously ill or hospitalized patients is increased if associated with low body mass index. On the contrary, there is a decline in cognitive abilities and increased risk of many chronic diseases in patients with increased body mass index. Body growth and development is also affected due to malnutrition especially during adolescent period. The most common presentation seen in young adolescents is anemia, with iron deficiency being the most common cause for it. Red cell distribution width (RDW), is a measure of the variability in size of circulating red blood corpuscles, and is calculated by automated blood cell counters as part of the routine blood cell count analysis. Conventionally, RDW and mean corpuscular volume (MCV) are used in the differential diagnosis of anemia, particularly anemias that are microcytic (caused by iron deficiency) or macrocytic (due to vitamin B12 or folate deficiency). An increase in RDW can also result from conditions that alter the shape of red blood cells due to the premature release of immature cells into the bloodstream, hemoglobinopathies, or other hematological diseases. We hypothesize that nutritional status of an individual may influence hemopoietic tissue and may lead to anisocytosis, poikilocytosis or both. An index of anisocytosis is red cell distribution width (RDW) which may correlate with the nutritional status as assessed by anthropometric parameters.

Objectives

1. To record body weight and height of all subjects and to calculate the body mass index.
2. To measure concentration of hemoglobin, blood indices and to calculate red cell distribution width of all subjects.
3. To correlate anthropometric and hematological parameters measured.

Materials and Methods : This study was conducted in the department of Physiology after obtaining approval from Institutional Review Board. A total of 71 subjects (males: 21; females: 67) between the age group of 18-25 years were included in this study. Informed consent was taken from all subjects.

Subjects less than 18 and more than 25 years were excluded from this study. Subjects already on iron supplementation; with any chronic disorder like asthma, tuberculosis, etc.; with any acute infection at the time of study were also excluded.

A case report form was given to all subjects for entering their details.

Calculation of body mass index (BMI): Subject's height was measured to the nearest centimeter, while standing on a levelled ground. Subject's weight was recorded using the Krups weighing machine to the nearest 0.1 kg, while standing straight with minimal clothing. Body mass index was calculated using weight in kg divided by square of height in meters.

BMI categories were as follows:

1. Underweight: $< 18.5 \text{ kg/m}^2$
2. Normal Range: $18.5 - 22.99 \text{ kg/m}^2$
3. Overweight: $23 - 27.49 \text{ kg/m}^2$
4. Obese: $> 27.5 \text{ kg/m}^2$

Blood collection: 2 ml venous blood was drawn from antecubital vein under aseptic precautions in vacutainers containing citrate. Blood samples were analyzed in an automated cell counter within 24 hours of collection for hemoglobin (Hb), red blood cell (RBC) count, mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), Red cell distribution width (RDW).

Statistical analyses: Data obtained was analyzed with SPSS 17.0 statistical software. Correlation statistics using Pearson's correlation coefficient was done on the data. Statistical significance was fixed at $p < 0.05$.

Results : Age of the subjects did not show any correlation with hematological parameters. Height and weight of the subjects had positive correlation with red blood cell count ($r = 0.38$, $p = 0.001$; $r = 0.34$, $p = 0.004$ respectively) and hemoglobin concentration ($r = 0.52$, $p = 0.000$; $r = 0.42$, $p = 0.000$). Red cell distribution width-standard deviation (RDW-SD) had a negative correlation with height ($r = -0.33$, $p = 0.004$) and weight ($r = -0.31$, $p = 0.008$) of the subjects. Body mass index (BMI) has negative correlation with red cell distribution width-standard deviation ($r = -0.234$, $p = 0.05$)

Conclusion : This study showed that nutritional status as assessed by height and weight revealed significant correlation with hematological parameters like hemoglobin, red blood cell count, red cell distribution width.

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P/ H/2

Prevalence of anemia in medical students of Career Institute of Medical Sciences & Hospital, Lucknow

M M KHAN, SHWETA SEHGAL, RAHUL KAPOOR

Background: Anemia is not a single disease but a group of disorders in which hemoglobin concentration of blood is below the normal range for the age & sex of the subject. It is amongst the most common disorders affecting mankind. 30% of the world's population may be affected at time. The medical students may also suffer anemia because of long schedule of work in college, clinical labs and extra-curricular activities which may disturb their food timings. They come from different socio-economic & cultural backgrounds and belong to various geographical regions of the country.

Method: A cross sectional study was conducted among the first year MBBS Students . A total of 100 students enrolled in the batch with age ranging 20 to 26 years were studied. A structured questionnaire, which include general information, sign and symptoms regarding anemia, dietary habit, BMI, general physical examination, systemic examination and a Sahli's method for Hemoglobin estimation were carried out.

Results: Out of total 100 students 59 students were found anemic. Out of these 35 (i.e. 52%) were male students and 24 (i.e. 72%) were female students. The cutoff hemoglobin level below 12.0 gm% was considered parameter of anemia. The mean hemoglobin concentration among students was 12.6 gm % with standard deviation of 1.62, variance of 2.64, and median of 12.8.

Conclusion: Anemia is a mild public health problem among medical students of CIMS & H, Lucknow. Implementing lifestyle changes and periodic screening of the medical students of all fields of study. A concerted effort is needed for dietary modification, deworming and iron supplementation for correction of anemia.

P/ H/3

Comparative study between the maternal and neonatal factors on the Reticulocyte count and Haemoglobin content of Umbilical Cord in Sikkimese Newborns

ARUNA PRADHAN, D K JHA

Background: Haematological values in newborns are an index of health and depend to a large extent on maternal,

social and geographical factors. The haematological parameters in newborn are distinctly different from normal adult values. Despite advances in perinatology over the past years, the exact influence of perinatal factors on hematological values in cord blood is still unclear. The aim of the study is to correlate the effect of maternal factors and neonatal factors on the reticulocyte count and the haemoglobin content of new born using cord blood.

Objectives: To study the effect of maternal factors and neonatal factors on Haemoglobin content and reticulocyte count in umbilical cord blood of newborns of sikkim.

Material and Methods: The maternal factors taken into consideration were mode of delivery, age, parity and neonatal factors were sex, birth weight, gestational age. Newborns with complicated pregnancy and labour was compared with newborns of normal pregnancy and labour. 150 cord blood samples were taken in an EDTA (Ethylene Diamine Tetra acetic Acid) tube under aseptic condition after clamping of the neonate's umbilical cord. Hemoglobin estimation was done by spectrophotometry. Reticulocyte count was done by manual method. Statistical analysis were done by SPSS 16.0 with students "T" test and P value <0.05 as the lowest limit of significance.

Results: The study included mothers of age 17 to 42 years and newborns were of birth weight with range of 1.9-4.5 kg. The Primigravida were 77 (51.3%) and multigravida were 73 (48.7%). The percentage of female newborns were greater than males. In normal vaginal delivery newborns, the mean hemoglobin content of cord blood was 13.9 gm/dl(+2.6 S.D) and the mean reticulocyte count was 2.48 %(+0.88 S.D). Similarly the mean Hemoglobin and Reticulocyte count of cord blood among caesarean section newborns were 16.2 gm/dl (+3.42.9 S.D) and 3.06 % (+.971S.D) respectively. The test of significance of reticulocyte count and hemoglobin content were $p < 0.023$ and $p < 0.006$ respectively. The reticulocyte count of newborn >2.5kg were significantly higher than the newborn of ≤ 2.5 kg. The parity, sex of newborns had no influence on cord blood reticulocyte count, hemoglobin content and there was no statistical difference. The reticulocyte count and hemoglobin content of newborns with complicated pregnancy and labour were higher than those born without complication. The reticulocyte count and hemoglobin content of newborns with gestational age >41 weeks had higher values than that of gestational age <37 weeks.

Conclusion: The study shows that levels of cord blood Hemoglobin and Reticulocyte count was affected by mode of delivery and birth weight where as parity, age of mother and sex has no effect. The reticulocyte count and hemoglobin content of newborns increases as the gestational age increases. It also shows that complicated pregnancy and labour had an influence on the values of

reticulocyte count and hemoglobin content of cord blood but it showed no statistical significance.

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P/ H/4

Umbilical Cord Blood Platelet Count and Indices in Different Gender

RUMI DEBBARMA, M ANITA DEVI

Background : Platelet indices are useful markers of platelet maturity, function and early diagnosis of thromboembolic disorders.

Objective : To evaluate umbilical cord platelet count and platelet indices in different gender.

Materials and methods : A cross sectional study was conducted in the Department of Physiology in collaboration with the Department of Obstetrics and Gynaecology, RIMS, Imphal, Manipur.

Study duration : November 2014 to August 2015.

Sample size and collection: 383(male=192, female=191) cord blood samples were collected in EDTA vials immediately after normal vaginal delivery. Blood count was made by using automated Haematoanalyzer (SAMSUNG LABGED HClO, MODEL: IVD-CIOA)

Results : Out of 383 newborns, platelet count was within normal limit in 142(74%) males and 156(81.7%) females however in 50(26%) males and 35(18.3%) females platelet count was found reduced ($p=0.045$). Platelet crit was within normal limit in 134(69.8%) males and 138(72.3%) females, whereas 58(30.2%) males and 53(27.7%) females had lower platelet crit ($p=0.338$). Mean platelet volume (MPV) was normal in 145(75.5%) males and 134(70.2%) females and in 47(24.5%) males and 57(29.8%) females MPV was found decreased ($p=0.143$). 135(70.3%) males and 140(73.3%) females had normal platelet cell distribution width (PDWc) and it was lower in 57(29.7%) male and 51(26.7%) female newborns($p=0.296$).

Conclusion : This study showed that male newborns have lower platelet count, platelet crit, PDWc than female, however female newborns have lower MPV than males.

Key words : Newborns, Platelet count, Platelet crit, MPV, PDWc.

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P/ H/5

Blood Group Distribution and Its Relationship with Bleeding Time and Clotting Time in UG Medical Students

**RAKESH WADHAI, RAHUL KHOBRADE,
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Background : Blood group plays vital role in field of transfusion medicine. There is clear association between ABO blood group status and von Willebrand factor. The relationship between BT, CT and blood groups is important in epistaxis, cardiac surgery and thrombosis.

Objective :

1. To determine the blood group of subjects.
2. To assess relationship between BT and CT among various blood groups and to identify any gender difference among the same.

Materials and methods : Our study included 400 MBBS students in age group of 17-20years. The blood grouping was carried out with standard antisera, bleeding time (by Duke's filter paper method) and clotting time (by Wright's capillary tube method) were estimated. Finally, bleeding time and clotting time of different blood groups were compared and statistical analysis was carried out.

Results : Blood group B(40%) was most common blood group in both gender. Bleeding time was prolonged (>4min) among O group and difference was statistically significant.(p=0.01)

Clotting time was prolonged (>6 min) among O group but the difference was statistically insignificant.(p=0.12)
Gender wise clotting time was prolonged in females than males and differences was statistically significant.(p=0.02)
Bleeding time was prolonged in females than males but the difference was statistically insignificant.(p=0.5)

Conclusion : In our study, blood group B predominated followed by O, A and AB. Bleeding time was prolonged in blood group O followed by B, AB & A. Clotting time was prolonged in blood group O followed by B, AB & A. Gender wise bleeding and clotting time were higher in females than males.

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P/ H/6

Mean Platelet Volume and C - reactive protein is an Early Predictor of Neonatal Sepsis

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Background : Neonatal sepsis (NS) is a potentially life-threatening clinical condition that requires early intervention. Neonatal Sepsis is associated with high morbidity and mortality rates if not treated promptly. C-Reactive protein(C-RP) is acute phase reactant synthesized in liver in response to inflammatory cytokines. Mean platelet volume(MPV) is a measurement that describes average size of platelets in blood. The aim of the study is to investigate any changes in MPV and C-RP & their predictive value in diagnosis of Neonatal sepsis

Objective : To determine MPV and C-RP in Neonatal sepsis& To evaluate the utility of MPV& C-RP as a predictive marker in Neonatal sepsis.

Materials and methods : It is case-control study. The Study is divided in 2 groups control group& proven sepsis.The study included all Inborn delivered neonate at Era Lucknow Medical College& Hospital,Lucknow. Mean Platelet volume has been done by Automated cell counter machine placed in Hospital laboratory services(HLS). Detection of C-Reactive Protein has been done by ELISA in Department of Microbiology

Results : A total of 55 patients with Neonatal Sepsis & 55 healthy controls were enrolled. There was stastically significant rise in MPV and C-RP values both on day 1and day 3 in case and control group

Conclusion : MPV and C-RP could be used for early detection of Neonatal sepsis.

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P/ H/7

Effect of anemia on red cell distribution width in adolescent females

LAJJA PATEL, R K PATEL

Background : The red cell distribution width (RDW) indicates the heterogeneity of red blood cell sizes, i.e., anisocytosis. It is measured by automated method and forms a reliable tool for diagnosis and prognosis of anemia.

Objectives : To study the effect of Anemia on RDW in adolescent population.

Material and Methods : Adolescent females who volunteered for the study were selected. They were then subjected to blood test for measurement of Hemoglobin and other parameters. A total 80 volunteers participated of which Anemic (n=58) and non Anemic (n=22) were identified and their test results were analysed.

Results : The mean Hemoglobin level of the adolescent volunteers was 11.04 ± 1.73 and the RDW was 16.19 ± 3.46 . The levels of Hemoglobin were correlated to that of the MCV, MCH and MCHc, a positive correlation was found with (r=0.46), (r=0.48) and (r=0.46) respectively. P value < 0.05 was considered as significant.

Conclusion : Hemoglobin levels affect RDW. A low hemoglobin level significantly raises the RDW. Thus RDW can be used as a tool along with other parameters to accurately classify anemia

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P/ H/8

Effects of stress during university examination on the differential Leucocyte count (DLC), HR, and BP

SANJAY KUMAR , KUNAL, SHIPRA DAS, D K JHA

Background : Medical university examinations are known to cause mental stress. Stress can lead to changes in the normal functioning of the human body.

Objectives : This study was done among the 1st professional MBBS students of SMIMS to determine the effect of university examination on vitals and differential leucocyte count (DLC).

Material and Methods : 100 students, 26 male and 74 female, aged 18 to 21 years, were randomly assessed before and during their 1st professional university examination. Total of 13 Students suffering from fever, hypertension and on long term medication were excluded. 87 students were subjected to clinical check-up (Blood Pressure & Heart Rate) and estimation of DLC by staining the blood smear with Leishman's Stain. The statistical analysis was done with the help of SPSS.

Results : Data were analysed and compared with pre-examination results. 85% students were having significant increase in neutrophil count, heart rate and systolic blood pressure. However, Eosinophil, Lymphocytes and Monocytes counts were found to be decreased.

Conclusion : Examinations in medical school are stressful enough to produce changes in heart rate, blood pressure and differential leucocytes counts although all the students were in good health status.

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P/ H/9

Prevalence of ABO & Rh+ve Blood Groups among the Hypertensive Male Population in Greater Guwahati

HEEMANSHU SHEKHAR GOGOI, BONTI BORA

Background : Hypertension is the subsequent elevation of the systemic arterial pressure to a level that places the patients at increased risk for target organ damage. More than 140/90 mm Hg should be considered hypertensive and should get treated.

Objectives : To evaluate the prevalence of ABO and Rh blood groups among the hypertensive patients in greater Guwahati.

Material and Methods : It is a population-based study done in greater Guwahati. Out of a total sample size of 300 subjects 141 male non-vegetarian subjects of age-group 35-55 years having ABO and rhesus positive blood group and without any familial hypertensive history or other comorbidities were selected. Their basal blood pressures were determined using palpatory and auscultatory methods. Their blood groups were determined using slide haemagglutination technique.

Results : 63 out of 141 hypertensive patients belonged to O rhesus positive blood group, so its prevalence is 45%. Similarly, out of 141 patients 49 patients i.e. 35% belonged to B rhesus positive, 26 patients i.e. 18% belonged to A rhesus positive and 3 patients i.e. 2% had AB rhesus positive blood group. Also, out of 300 samples the hypertensive cases were only 141 and the rest were normotensives, so the prevalence of hypertension in greater Guwahati is 47%.

Conclusion : The blood group O rhesus positive is the most prevalent one followed by B rhesus positive which is followed by A rhesus positive and lastly by AB rhesus positive blood group which is the least prevalent blood group among hypertensive patients.

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P/ H/10

Prevalence of Hemoglobinopathies in Northeast India

KARTHIKA M, KSH GOMTI DEVI

Background : Hemoglobinopathies are the world wide prevalent monogenic genetic disorder affecting the structure, function, or production of hemoglobin with variable geographic distribution. In the southeast asia and Indian subcontinent, this has been considered as common disorder of blood posing a major genetic and public health problem.

Objectives : To analyse the hemoglobin variants in Northeast India

Materials and methods : This is a Cross Sectional study conducted in the Department Of Physiology, Department Of Pathology, RIMS between Jan 2014 – Feb 2015. A total of 100 from Northeast India were included in the study. Interlab Genio Instrument For Alkali and acid Hemoglobin Electrophoresis was used. Data Entry And Analysis Was Done Using SPSS Version-16. Approval Was Taken From The Rims Institutional Ethics Committee.

Results : Among 100 of population surveyed 11% of the study population shows the presence of abnormal hemoglobin. 5% were found to be beta thalassaemia carrier, 4% HbE trait and 2% Sickle cell trait.

Conclusion : High prevalence of hemoglobinopathies where Beta thalassaemia in heterozygous state occurred more frequent than other hemoglobinopathies. The study concludes that it is important to explore the hemoglobin variants in Northeast India so that the carriers can be detected and the serious damage to the future generation can be prevented.

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P/ H/11

Haematological Assessment of Petrol Pump Workers in Guwahati City in Relation to Chronic Inhalation

BARASHA BARMAN, REETA BAISHYA,
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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 haematopoietic system causing bone marrow depression.

Objectives : To study the Haemoglobin percentage and RBC 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 and methods : The study was carried out on 30 healthy male petrol pump workers aged between 25 to 40 years as cases, working more than 5 years in petrol pumps of Guwahati city. 30 apparently healthy male individuals of the same age group were taken as controls. Haemoglobin estimation was done using Sahli's Haemoglobinometer and RBC count was done using improved Neubauer's counting chamber in the department of Physiology of Gauhati Medical College, Guwahati.

Results : All the quantitative data were presented as mean(x) \pm Standard deviation(SD) and were compared using unpaired t-test. The mean values of haemoglobin (in gm %) were 11.84 ± 1.168 in the study group and 13.52 ± 0.735 in the control group. Those of RBC count (millions/cumm) were 4.17 ± 0.479 and 4.533 ± 0.547 in the study and control group respectively. These show that mean values of Hb% and RBC count were significantly decreased in the test group when compared with control group. The results obtained were statistically significant, p-value being less than 0.0001 in case of Haemoglobin and 0.0082 in case of RBC count.

Conclusion : This study has suggested that chronic exposure to petroleum derivatives had toxic effects on haematopoietic system causing bone marrow depression and reduced cell count.

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P/ H/12

Nail Growth in Fe Deficiency Anemia

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Background : Iron deficiency hampers growth of different tissue including nails due to impaired dna synthesis.

Objective : Observation on nail growth in iron deficiency anemia patients and effects of iron replacement on nail growth.

Materials and methods : Ten patients were selected and marking on nail plate were made in two fingers of each hand. the distance of the mark from nail bed was measured at the interval of every 10 days in 30 days period. same procedure was done in patient after giving iron therapy. nail growth measurement and blood parameters (hb, serum ferritin etc.) were determined for both pretherapy and post therapy patients.

Results : Using 't' test there was no significant difference in nail growth following therapy (fe dextran or oral iron therapy) as compared to pretherapy.

Conclusion : Iron therapy does not significantly increase the nail growth during one month in patient with ida.whether nail growth would

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P/ H/13

Effect of Cigarette Smoking on Blood Picture

AMIAY KUMAR

Background : Cigarette smoking is one of the major leading cause of death and essential public health challenge in the world.Smoking has both acute and chronic effects on haematological values.Moreover,episodic duration of smoking and age of individual might have changed the adverse effects of blood characteristics of human being.

Objective: Smoking creates a plethora of health related problems.The aim of the present study was to assess the extent of adverse effects of cigarette smoking on biochemical characteristics of blood in male population.

Materials and Methods: One hundred and forty two male subjects participated in this study: smokers (n=71) and nonsmokers (n=71). The smokers were regularly consuming 11-20 cigarettes per day for at least 3 years.Non of the volunteers in both groups had a history of medication 3 months prior to blood sampling. Complete blood cell count were measured by fully automatic haematological analyzer.Statistical analyses was carried out using the unpaired student “t” test.

Results: The smokers had significantly higher levels of white blood cell (p<0.027), red blood cell (p<0.011), haemoglobin (p<0.001) and haematocrit (p<0.006), whereas mean corpuscular haemoglobin concentration (p<0.009) and platelet count (p<0.017) were significantly lower.The differences detected between peripheral blood leucocytes and erythrocytes composition of smokers and non-smokers may be reflections of the gaseous and solid phases of cigarette smoke toxic product effects on the bone marrow as well as the adaptive,defensive and immunologic reactions of the body to long term active smoking.

Conclusion: In conclusion, our findings showed that continuous cigarette smoking has severe adverse effects on haematological parameters (e.g., haemoglobin, haematocrit, WBC count, RBC count, and platelet count) and these alterations might be associated with a greater risk for developing atherosclerosis, polycythemia vera, chronic obstructive pulmonary disease and/or cardiovascular diseases.

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P6. Nerve/ Muscular

P/ NM/1

Ulnar Nerve Motor Conduction Velocity Correlates with Body Mass Index in Healthy Young Subjects

**KUMAR SARVOTTAM, RITESH KUMAR NETAM,
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Background : The prevalence of obesity in India ranges from 10-40 %. The adiposity is characterized by increased body fat, which in turn leads to dyslipidemia, insulin resistance, cellular stress and vascular inflammation. Altered lipid metabolism and oxidative stress associated with adiposity may affect nerve conduction velocity (NCV). There are some studies which tried to observe the relationship between body composition and nerve conduction velocity, however, there are contradictory results regarding nerve conduction and body composition in the studies conducted in obese individuals

Objective : To study the correlation between Body Mass Index (BMI) and Ulnar and Median nerve motor conduction velocity.

Material and Methods : 27 otherwise healthy subjects (13 males & 14 females) aged 28.27 ± 3.49 years of BMI 24.99 ± 3.14 kg/m² were recruited in the study after obtaining informed written consent. Weight and height of subjects were recorded by using digital weighing machine and stadiometer respectively taking all due precautions. Recording of nerve conduction velocity was performed on ADI stimulation and recording devices. Supramaximal stimulus was given at elbow and wrist and EMG was recorded from hypothenar muscle of the same limb. Statistical correlation was achieved by using Pearson correlation using SPSS software version 11.5.

Results : There were significant positive correlation (r= 0.433, p=0.027) between BMI and Ulnar Nerve Motor Conduction Velocity, while a non-significant weak positive correlation (r= 0.107, p= 0.605) was observed between BMI and Median Nerve Motor Conduction Velocity.

Conclusion : Our study suggests that there is positive correlation between BMI and Ulnar nerve Motor conduction velocity.

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Is Metabolic Equivalent a Good Indicator of Functional Exercise Capacity in Patients of Suspected Coronary Artery Disease Undergoing Cardiac Stress Test (TMT) Using Bruce Protocol?

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SHAVANA RANA

Background : Metabolic equivalent (MET) is used to express the energy cost of exercise. The MET's achieved during cardiac stress testing (CST) is used to prognosticate on risk of morbidity & mortality due to CAD. No study to define the value of 1 MET in Asian-Indians could be found. In view of ethnic differences and poor fitness in cases of suspected CAD it is likely that the MET value of 3.5mL/Kg/min significantly over/under-estimates true energy consumption at rest and/or during a CST

Objective : To establish the value of 1 MET in Asian-Indian adults and compare measured oxygen consumption (VO₂) with VO₂ calculated from MET's during CST in cases of suspected CAD

Materials and methods : 100 patients (70males and 30 females) with suspected CAD undergoing a cardiac stress test by Bruce protocol were studied. Oxygen consumption was measured as well as calculated from the METs achieved during the CST

Results - Measured mean VO₂ was 4.03±0.74ml/kg/min in males and 3.96±0.62ml/kg/min in females. Measured mean VO₂ in stages 1-3 of CST was 18.19, 23.22 and 27.68 ml/kg/min versus calculated values of 16.25, 23.37 and 32.03 ml/kg/min in males. In females measured VO₂ was 17.45, 20.29 and 21.87ml/kg/min versus calculated values of 15.89, 21.92 and 26.89ml/kg/min. The measured VO₂ was significantly different (p<0.05) in the resting state and stages 1 and 3 of CST in both groups

Conclusion : The value of 1 MET in Asian-Indian adult population is significantly different from the accepted. Use of MET's for assessing exercise capacity during a CST by Bruce protocol introduces significant error in estimation of exercise capacity in patients with suspected CAD

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Effect of Stature height on Step Height

ANJUM DATTA, OMLATA BHAGAT,
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Background : Step tests are used widely to assess the physical fitness index (PFI). The different type of tests with different step height, rate and duration, are devised for the ease of different type of population with different stature, BMI and other factors to assess PFI.

Objective : To determine the effect of stature height on the natural step height in healthy individuals.

Materials and methods : 20 males, in the age group 18-40 years participated in the study. The subjects were told to lift up the foot as done in a step test. The stature height and the natural step height of each subject were measured. The step height was calculated by averaging the heights of 10 consecutive steps.

Results : The stature height and average step height of the subjects showed statistically significant correlation (Correlation coefficient, $\rho = 0.530$, $p = 0.016$) at $p < 0.05$.

Conclusion : Existing literature suggests that biomechanical efficiency and work rate is determined by step height. It is also reported that accommodation of step height to the subject's stature height provides a better estimation of aerobic capacity. If a step is too high, local muscular fatigue may ensue before true assessment of PFI and the test will be a measure of muscular endurance of the leg muscles than of PFI. Therefore stature height should be taken into consideration while performing a step test.

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A study of Nerve Conduction Velocity in Prediabetics

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Background: Prediabetes is a stage preceding to type 2 diabetes, with either impaired fasting glucose (IFG) or impaired glucose tolerance (IGT) or both or increased HbA_{1c}, diagnosed as per ADA criteria. 50% of prediabetics with IFG develop overt diabetes over a period of 10 years raising the risk of developing cardiovascular disease (CVD) and peripheral neuropathy.

Objective: To determine Nerve conduction velocity in prediabetics and healthy controls.

Material and Methods: 30 subjects, around 40 to 60 years of age, registered in Medical OPD, Smt. Suchita Kriplani Hospital fulfilling inclusion, exclusion criteria and consenting were enrolled for study. They were divided into two groups: 15 prediabetics (cases) and 15 normal subjects (controls) as per ADA criteria. NCV was recorded on these subjects using Schwarzer Topas EMG 4channel EMG/NCV/EP system by Natus Europe GmbH machine. Statistical analysis was done using Graph Pad Prism Version 5 software.

Results: Prediabetics exhibited a significant reduction in NCV (48.68 ± 1.907 m/s) in motor peroneal nerve as compared to controls with corresponding values of 55.19 ± 0.9353 m/s ($p=0.0048$). Motor peroneal latency amongst prediabetics (8.175 ± 0.4537 ms) was significantly increased ($p=0.0302$) as compared to control group (6.912 ± 0.3169 ms). Positive correlation was found between fasting blood glucose and peroneal latency amongst prediabetics ($r=0.3728$). No significant changes were found in sural sensory NCV.

Conclusion: The present study demonstrated, early onset of motor neuropathy changes among prediabetics as compared to healthy controls. Longer studies are recommended on large population to see changes in sural nerve conduction if any, among prediabetics.

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P/ NM /5

A Novel Quantitative Method to Physiologically Stretch the Quadriceps to Elicit and Quantify the Myotactic Reflex

**ANANDIT JOHN MATHEW,
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SURESH DEVASAHAYAM**

Background : The myotactic reflex and reciprocal inhibition are elicited by a tendon tap or by electrical stimulation. These methods are artificial. Further, velocity of muscle stretch produced by tendon tap is not within physiological limits.

Objectives : To develop and standardise a quantitative method to physiologically stretch the quadriceps muscle to elicit and measure the myotactic reflex and reciprocal inhibition.

Material and Methods : A known weight is attached via pulleys to a magnetisable splint connected to the leg of the seated subject. The leg is extended, held at different angles by a software-controlled electromagnet. On turning off the electromagnet, the falling weight pulls the leg into a quick

flexion. An electronic goniometer records velocity and magnitude of stretch. EMG recorded from quadriceps and pre-contracted hamstrings were ensemble averaged with/without rectification to quantify myotactic reflex and reciprocal inhibition respectively. Recordings were done in 30 subjects.

Results : We elicited and quantified the latencies and amplitudes of the myotactic reflex and reciprocal inhibition; and measured velocity and magnitude of stretch by this method. The average resting velocity of stretch with 15 Kg was 39.8 ± 12.3 m/sec and average latency of myotactic reflex from point of release of electromagnet was 46.4 ± 24.50 ms.

Conclusion : We have developed a novel method to physiologically stretch the quadriceps muscle and record myotactic reflex and reciprocal inhibition. The latency data was comparable to known latencies for the myotactic reflex. The amplitude of the response depends on the magnitude and velocity of stretch, but more experiments and analysis are required. This method also provides the velocity and magnitude of stretch, which enables its use for comprehensive studies under physiological conditions.

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P/ NM /6

Bio-potential Computer Interface for Moving Artificial Hand Model using Surface EMG Signals

**SIJU G CHACKO, NAVDEEP AHUJA, VINAY
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Background : Bio-potentials like EMG and EEG can be used to control external devices like computers, motors etc. (Bio-potential computer interface). These bio-potentials can be used for controlling prosthetic limbs. But it is difficult to attain a functional prosthetic limb in India at low cost.

Objectives : To re-create a low cost non-invasive EMG based functional prosthetic limb

Material and Methods : Wireless 8 channel 32 bit "OpenBCI" board was used to acquire EMG with gold plated surface electrodes from arm. The subject was asked to flex or extend the specific joint for muscle of interest, from where EMG were recorded. Programming language "Processing" was used to acquire and analyse data, which sent data to microcontroller "Arduino UNO" which indeed moved the prosthetic model using servo motors via tendon pulley system

Results : In repeated trials on different subjects over different muscles, there was an activation of motor on contraction with 95% true positive and 10% false positive

responses. The computer was able to identify the muscle contractions and was able to communicate successfully with the microcontroller for desired movement of the prosthetic model.

Conclusion : EMG signals are good for controlling prosthetic limb with a high signal to noise ratio. EMG recording was superior to EEG recording in terms of excluding movement artefacts, but complexity of information that can be produced via EEG suggests using EEG signal instead of EMG in future experiments.

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P/ NM /7

Adaptation to Type of Training Load: An EMG study in Elite Athletes

ATUL SHEKHAR, BK NAYAK, LATIKA MOHAN

Background : Muscle fiber composition and fatigue characteristics are different in strength or endurance trained elite athletes, this may be a result of muscle adaptation to specific training loads. EMG power spectra can be used to study these differences.

Objectives : Study the effect of long-term training on the muscle fatigue and fiber composition.

Material and Methods : SEMG was recorded in country's elite athletes who were either endurance (Marathoners/ Long distance runners, En; n=20) or strength (Weight lifters / Throwers, St; n=20) trained for past > 5 years. The fall in EMG median frequency (MDF) of two upper body (Biceps Brachii; BB & Triceps; TR) and two lower body (Vastus Lateralis; VL & Biceps Femoris; BF) muscles, during 80% MVC isometric contraction was used to assess fatigability and thus the predominant muscle fiber type. Similar data was also collected in untrained controls (Un; n=20).

Results : MDF showed no significant fall ($p > 0.05$) during the task in TR and VL in all the groups, indicating higher proportion of type I fibers and inconsequential influence of type of training. BB & BF (St & Un only) MDF fell significantly ($p < 0.05$) during the task indicative of more type II fibers. BF MDF in En group though showed a decrease but it was not statistically significant ($p > 0.05$).

Conclusion : The results indicate higher proportion type I fibers in hamstrings (BF) of Endurance trained athletes when compared to other subjects, suggestive of its adaptability to long-term endurance training.

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P/ NM /8

The Electromyographic Study of Triceps, Biceps, Deltoid and Abductor Pollicis Brevis Muscle in Patients of Cervical Spondylotic Radiculopathy

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Background : Cervical spondylitis is usually an age related condition that affects the joints of neck. It develops as a result of the wear and tear of the cartilage and bones of the cervical spine. There may be abnormal growth or spurs on the bones of the spine. It is a common disorder affecting people most often 4th and 5th decade of life. Patient complaining of neck pain. Patient also complaining of tingling, numbness or loss of sensation along with nerve root dermatome. EMG is used for evaluating and recording the electrical activity produced by skeletal muscle. It evaluates motor axonal loss or motor axon conduction block.

Objectives : To find out which nerve root is commonly involved in cervical spondylitis patients.

Materials and Methods : In this study 30 patients with clinical symptoms of cervical spondylitis. Clinical and radiologically proven cases will be included and EMG done by concentric type of needle in 4 muscle that is Triceps, Biceps, Abductor pollicis brevis and Deltoid.

Results : The average recruitment of all 4 muscles that is Biceps, Triceps, Abductor pollicis brevis and Deltoid are 83.2%, 43.6%, 74.8%, 82% respectively. Out of 30 patients 28 has abnormal finding in EMG in Triceps, 10 in Abductor pollicis brevis, 12 in Biceps and 5 in Deltoid muscle.

Conclusion : In Cervical Spondylitis radiculopathy patient the Triceps muscle shows decreased recruitment of MUP in almost 90 %. The relationship between all 4 muscle was non-significant. It concluded that the most affected muscle is Triceps, nerve root involved is C7- C8 most commonly.

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P/ NM /9

Effect of Handedness on Motor Nerve Conduction Velocity and Grip Strength in Healthy Male Subjects

SUMIT GARG, RAMYA CS, VINUTHA SHANKAR, KARTHIYANEE KUTTY, JL AGARWAL

Background : Dominant hand plays an important role in most daily activities.

Objectives : This study aims to assess effect of handedness on median motor NCV and grip strength.

1. To compare the motor NCV with handedness.
2. To compare hand-grip strength with handedness.
3. To compare motor NCV and grip strength of dominant hand of right & left handers.
4. To compare motor NCV and grip strength of non-dominant hand of right & left handers.

Material and Methods : 30 right-handed & 30 left-handed healthy males, 20-40 years of age, not doing heavy physical work, no H/O diabetes or neuropathy were enrolled. Median motor NCV & Grip strength of both hands was measured using RMS-EMG-MARK-II machine and hand-grip dynamometer respectively.

Results : Mean NCV of dominant hand (58.2±5.4m/s) in right handers was significantly higher than non-dominant hand (54.45±5.2m/s). Same is true for left handers (58.94±4.6m/s vs 56.58±4.1m/s). Hand grip strength of dominant hand was higher significantly in dominant hand of right handers (25.2±5.04 vs 20.96±7.17) but no difference in left handers. There was no difference in the NCV and grip strength of dominant hand of right & left handers. But NCV and grip strength of non-dominant hand was significantly higher in left handers (56.57±4.1m/s, 26.97±3.25) than right handers(54.17±5.1m/s, 20.96±7.17). NCV of dominant & non-dominant hands were different in both right & left handers, so normative data should consider handedness.

Conclusion : Dominant hand is stronger in right handers but no such significant difference for left handers. This may be because left handers use non-dominant hands for many daily activities.

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P/NM /10

Comparison of Neuromotor Skills in Smokers and Non Smokers between the Ages of 30 To 45 Years to Study the Effect of Smoking

SHIVANI AGARWAL, SHARAD PATEL

Background : Long term cigarette smoking has proved to be a prime factor in heart disease, stroke, chronic lung disease and a contributor to cancer of many organs. It has also been associated with negative effects on several neurocognitive functions. This study was designed to evaluate the effect of smoking on a few domains of neurocognition, i.e. manual dexterity and static postural stability.

Objective : To study the effect of smoking on manual dexterity and static postural stability in healthy cigarette smokers and compare the results with healthy non smokers between the ages of 30 - 45 years.

Materials and Methods : 60 age and sex matched subjects, from Parel, Mumbai, between the ages of 30 - 45 years, were divided into 2 groups, with 30 subjects in each. Group A consisted of smokers; Group B, of non smokers. Measures of manual dexterity and static postural stability were assessed using the O'Connor Finger Dexterity Test [Model 32021] and Sharpened Romberg Test.

Results : The observed values of the two groups were compared using Unpaired t-test and the result was found to be highly significant ($p < 0.0001$). The performance of smokers on both tests was poorer when compared to that of the non smokers.

Conclusion : The results of this study indicate that cigarette smoking can contribute to a significant deficit in manual dexterity and postural stability, emphasizing its negative impact on many aspects of living, ultimately compromising the quality of life.

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P7. Respiratory Physiology

P/RP/1

Exhaled Breath Temperature as a Non Invasive Technique for Assessment of Airway Inflammation in Bronchial Asthma

BHUPENDRA SINGH YADAV, ANJANA TALWAR, D. GHOSH, R. GULERIA

Background : Bronchial Asthma, a chronic airway inflammatory disorder is a major cause of morbidity and mortality in India, characterized by airway inflammation and associated airway remodelling. Methods of assessment of airway inflammation are cytology of biopsy, bronchoalveolar lavage and induced sputum, with biopsy being the gold-standard technique.

Recently there are few evidences regarding exhaled breath temperature (EBT), a non invasive technique, as a marker of airway inflammation

Objectives : To study the differences in EBT in asthmatics as compared to otherwise healthy subjects.

Materials and methods : 24 male bronchial asthma and age matched 23 healthy controls were recruited in the study. Tidal breathing EBT was measured by means of a portable device (X- Halo breath thermometer) in both the groups.

Results : Mean EBT in patient group was 34.17 +/- 0.607 degree celcius which was significantly higher (p=0.038) than healthy controls (Mean EBT= 33.37 +/- 0.234 degree celcius). Although the core body temperature was statistically comparable in both groups.

Conclusion : EBT can be used as non-invasive marker of airway inflammation in asthmatics (larger sample study required, though, for confirmation).

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P/ RP /2

OSA and its Association with Hypertension and Road Accidents

SHRADHA SUMAN, KUMAR VIVEK

Background: Obstructive sleep apnoea (OSA), is characterized by loud snoring and excessive daytime sleepiness. Though the gold standard for diagnosis is overnight polysomnography (PSG), sleep questionnaires have also been used to diagnose this with good predictive value.

Objective: To correlate severity of OSA with Daytime sleepiness

Material and Methods: A pre-designed proforma with clinical details, symptom-specific questions for diagnosis of OSA, and Epworth Sleepiness Scale (ESS) was administered to 20 patients presenting to the Sleep Disorder Clinic of our hospital and to 40 age and sex-matched relatives (control group). The students χ^2 -test and chi-square were used as the statistical tests.

Results: There were 20 patients with a mean age of 41 \pm 8 years, and 40 controls with a mean age of 41 \pm 6 years (P=>0.05). Seven had family history of snoring in the study group and 3 in the control group (P=0.02). Four had met with road traffic accidents in the study group and none in the control group (P=0.001). The body mass index (BMI) was 29.9 (SD 4.4) in the study group and 24.5 (SD3.5) in the controls (P=0.001). The mean ESS was 13.3 \pm 6 in the patients and 4.2+ 4 in the controls (P=0.001). A larger number of patients with OSA had hypertension: 5/20 vs. 3/40 (P=0.01).

Conclusion: Patients with OSA had significantly higher BMI and ESS score, and were more likely to have hypertension and road traffic accidents. Increased awareness of this entity is essential.

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P/ RP /3

Comparison of Pulmonary Function Tests among Students of Urban and Rural Schools in the Age Group of 7 – 15 years.

KAJAL BHISE, M. T. JIVTODE, N. V. MISHRA

Background : Pulmonary function tests (PFTs) have been integral part of assessment of status of lungs. Variety of factors like socioeconomic status and environmental factors affect the PFTs. A few studies have been carried out in young children in India.

Objectives : To compare PFTs between urban and rural school children.

Materials and Methods : Consent was taken from the students and principal. Permission from Institutional Ethical committee was taken. After detailed history general and systemic examination students were included in the study. Only healthy students were selected in the age group of 7 to 15 years. 150 students from urban schools and 150 students from rural schools were selected. Their height and weight were measured by standard procedure. Pulmonary function tests were measured using computerized portable spirometer (Helios 401). FVC, FEV1, FEV1% & PEFR were recorded.

Results : The PFT findings were correlated with all the three independent variables i.e. age, height and weight in rural and urban children. All the variables were having linear positive correlation with PFTs (p< 0.05). Among all, height was having maximum coefficient of correlation.

Conclusion : Findings of PFTs were compared among urban and rural children by using unpaired student t-test. No significant difference in PFTs was observed among two groups (p>0.05).

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P/ RP /4

Ventilatory Control at Rest after Months of Stay at 3300m: A Comparison between Acclimatized Lowlanders and Natives at Leh

**SHELKA DUA, SURINDERPAL SINGH,
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ANIRBAN BHATTACHARYA, D BASANNAR**

Background : Control of alveolar ventilation at rest is regulated by interaction between chemical factors like PaO₂, PaCO₂, pH and neural inputs from brain stem and cortex. The effects of neuropotent chemicals like

progesterone, estrogen and serotonin superimpose on this neuro-chemical interaction. Stimulant effect of progesterone and estrogen on ventilation is proposed to be one of the mechanisms that can modify cardio-respiratory response of females at high altitude, both natives and sojourners.

Objectives : The objectives of our study were to compare various cardio-respiratory parameters of native highlanders (NHL) and acclimatized lowlanders (ALL) exposed to months of hypoxia and detect any difference in resting ventilation of males and females at 3300m.

Materials and methods : Heart rate, SpO₂, EtCO₂, respiratory rate, blood pressure and hemoglobin was recorded in five groups, namely, native highland males (NHLM), acclimatized lowland males (ALLM), native highland females in pre-menopausal age [NHLF(Pre)], post-menopausal native highland females [NHLF(Post)], and acclimatized lowland females (ALLF).

Results : Male sojourners showed higher ventilation than native males, while the difference between female sojourners and female natives was not significant. NHL women of reproductive age group had significantly lower end-tidal CO₂, (EtCO₂,) (p< 0.05) and higher heart rate (p< 0.05) than NHL males. EtCO₂, was lower in NHL females in the reproductive age-group (p< 0.05) than in postmenopausal group. Amongst the ALL, gender did not affect EtCO₂.

Conclusion : Young, male native highlanders of Ladakh have lower resting ventilation at their altitude of residence than age matched native females. This may be due to the effect of female gonadal steroids increasing ventilation as shown by the finding that post-menopausal women have ventilation similar to the males.

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P/ RP /5

To Evaluate the Airway Mechanics in Parkinson's disease using Impulse Oscillometry System (IOS)

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Background: Parkinson's disease (PD) is the second most common progressive neurodegenerative disorder. Morbidity and mortality are frequently associated with pulmonary dysfunction in patients with PD, which is traditionally assessed using spirometry, an effort dependent technique.

Objectives: To evaluate the airway mechanics in Parkinson's disease using Impulse Oscillometry System (IOS).

Materials and methods: The study was conducted on 15 patients diagnosed with Parkinson's disease. Assessment of pulmonary function was done using IOS. It measures central and peripheral airway resistances (R20, R5) and central and peripheral reactances (X20, X5) using sound waves with different frequencies, which is superimposed on the patients respiratory tidal volume.

Results: The mean age of patients was 62±10. Patients had elevated R5 (0.44±0.16 kPa s⁻¹ L⁻¹), R20 (0.34±0.1016 kPa s⁻¹ L⁻¹) and Resonant frequency (17.58±5.22 Hz). X5& X20(-0.11±0.07 & 0.017±0.05 16 kPa s⁻¹ L⁻¹ respectively) showed no significant difference when compared to healthy subjects.

Conclusion: Characteristic changes in IOS measurements have been found. R5, R20 and resonant frequency was higher in patients with Parkinson's disease compared to healthy subjects. This is an ongoing study. IOS is a simple effort independent technique and requires minimal cooperation from subjects. Thus, it is more suited for assessment of lung functions in patients with motor symptoms.

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P/ RP /6

To Study Change in Nasal Mucociliary Clearance (NMC) Time in Type 2 Diabetes Mellitus (DM)

GURUNG N, YADAV J, AGGARWAL HK

Background : Nasal mucociliary clearance plays a vital role in defense of the respiratory systems from nose to lower respiratory tract. It is an innate protective mechanism against foreign microorganisms, allergens and inhaled pollutant particulates. The impairment in NMC has been associated with frequent respiratory tract infections.

Objectives : To study change in nasal mucociliary clearance (NMC) time in type 2 DM patients.

Material and Methods : NMC time was ascertained in patients of type 2 DM between the age group of 40-55 years of either sex having diabetes for more than 3 years on treatment(n=30) and in normal healthy age and sex matched controls(n=30). The nasal mucociliary clearance was determined by Saccharine method of Anderson et al., by placing one millimeter(mm) diameter of saccharine in the floor of the nose just behind the anterior end of the inferior turbinate of sitting subject under direct vision and time taken to perceive sweet taste was recorded as NMC time.

Results : The NMC time was significantly prolonged in type 2 DM (16.51 ± 2.44 mins) as compared to control (10.36 ± 2.24 mins) ($p < 0.001$).

Conclusion : The prolong NMC time in diabetes may be due to alteration in carbohydrate metabolism leading to change in the mucus composition thereby, impairing mucus transport and ciliary activity. This change in NMC time may predispose type 2 DM patients to repetitive respiratory infections. Thus, this simple, inexpensive and noninvasive test can be used as early indication of subclinical pulmonary infections in type 2 DM.

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P/ RP /7

Correlation of Serum CRP and Spirometric Lung Function in COPD and Bronchial asthma patients in Manipur, India

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Background : C-reactive protein is an abnormal protein that appears in blood in acute stages of various inflammatory disorders but is undetectable in the blood of healthy persons. Worldwide studies have shown that it has variable role in Bronchial asthma and COPD patients, some showing negative correlation with spirometric lung function while others show no significant relationship.

Objectives : To estimate serum C-reactive protein levels in COPD and Bronchial asthma patients and to correlate with their respective spirometric parameters.

Material and Methods : In this ongoing cross-sectional study, total 31 patients attending Respiratory Medicine OPD, RIMS, Imphal were examined in Department of Physiology. Their Spirometric Lung Function was done with the help of HELIOS 401 Spirometer, CRP Level was estimated by Slide Agglutination method.

Results : On the basis of GOLD staging & Bronchial asthma diagnosis criteria, 13 patients were diagnosed as COPD (1 mild, 4 moderate, 6 severe & 2 very severe), 8 patients were asthmatic and remaining were normal (PFT within normal limit). About 46% of COPD patients who visited OPD for first time, had serum CRP ≥ 6 mg/L, while 54% of COPD patients who had previous history of treatment, had serum CRP < 6 mg/L. Around 12.5% of Asthmatic patients who consulted OPD on the same day of attack, had serum CRP > 6 mg/L, while rest (87.5%), who visited OPD next day or later or had history of treatment for asthma, had serum CRP < 6 mg/L.

Conclusion : COPD and Bronchial asthma are chronic inflammatory disorders, often presenting during their acute stage or exaggeration stage, with raised serum CRP levels.

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P/ RP /8

Forced Vital Capacity (FVC), Forced Expiratory Volume in 1st second (FEV₁) and Forced Expiratory Rate

HIMANSHU SHARMA, SHASHIKANT AGARWAL

Background : Petrol filling workers are employed rather than self serviced, increasing the opportunity for exposure in India. Long-term exposure to petrol vapour has shown to affect the different physiological systems in our body.

Objectives : The current study is carried out to find the dynamic ventilatory pulmonary function in petrol pump workers so as to comment on the long-term changes of work on pulmonary functions.

Materials and methods : This study was conducted on 30 males of 20-40 years age, who were working in various petrol filling stations as petrol filling workers, 8 hours per day for more than 2 years in Jhalawar and Jhalrapatan city. For comparison 30, age & BSA matched apparently healthy control group who were not exposed to petroleum vapor, from the nonclinical and para clinical departments of Jhalawar Medical College, Jhalawar will also be studied. Spirometry was performed with an computerised spirometer (Helios-401). The parameters studied were Forced vital capacity (FVC), Forced expiratory volume in 1st second (FEV₁) and Forced expiratory ratio (FEV₁/FVC).

Results : The two groups did not differ significantly on the basis of physical parameters. Both forced vital capacity (FVC) and forced expiratory volume at first second (FEV₁) were decreased significantly while their ratio did not change much between the two groups.

Conclusion : Our findings in favour of adverse effects of petroleum vapours on pulmonary function, mainly on lower airways with restrictive pattern of disease.

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P/ RP /9

Clinico-Spirometry Study of Lower Respiratory Tract Symptoms Patients in a Tertiary Hospital Kolkata

SUJOY MUKHERJEE, DEBAJYOTI DAS, GOUTAM BANERJEE, ANILBARAN SINGHAMAHAPATRA

Background : Chronic lung disease is a rapidly emerging pandemic. Emphasis is given on prevention. IPCC & WHO concluded that disease areas of concern due to global warming are allergic rhinitis, asthma, COPD, RTI, pollinosis

& wet-cough are the major symptoms. Prevalence of Lower Respiratory Tract Symptoms (LRTS) is high (12.7%) in WB but detailed picture is obscure.

Objectives : To obtain a detailed profile of patients with LRTS attending spirometry screening.

Materials and methods : 550 patients from urban areas of North 24-Parganas district, West Bengal (aged 18-60 years; male & female) presented with LRTS & were referred from OPDs to attend routine spirometric screening. Debilitated & asymptomatic patients, patients for pre-anaesthetic check up, with known co-morbidities like cardiovascular diseases, acute hemoptysis, subdiaphragmatic & otorhinolaryngological diseases were summarily excluded. Detailed clinical check-up was done. Spirometry was carried out following recommendations of ATS /ERS (2005) using Spirometer RMS HELIOS 702. Groups made based on FVC, FEV1, FEV1/FVC, FEF25-75 & PEFR values

- a) Normal
- b) Obstructive lung disease
- c) Restrictive pattern
- d) Mixed ventilatory defect
- e) Small airflow obstruction

Results :

- i) Proportion of obstructive lung disease is significantly higher in post bronchodilator spirometry & non pollinosis group.
- ii) Proportion of small airflow obstruction is significantly higher with lone B2 agonist users than combined drug users.
- iii) 53.63% of symptomatic patients had no appreciable clinical &/or spirometric findings yet they are using bronchodilators.

Conclusion :

- 1) Pollinosis is not associated with obstructive lung disease as observed in previous studies.
- 2) Proportion of obstructive lung disease is significantly increased post bronchodilator spirometry. Validation of ATS/ERS manouvre in Indian population is required.
- 3) Small airflow obstruction persists in patients using B2 agonist lonely.

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P/ RP /10

Assessment of peak expiratory flow rate in rice mill workers of Guwahati city

LOVELEENA SAIKIA, REETA BAISHYA

Background : Rice mill workers are potentially exposed to organic and inorganic dusts and synthetic chemicals. Grain dust has a long history of association with disease, and has adverse effects on various organs such as eyes, nose, skin, lungs and airways.

Objectives : To study peak expiratory flow rate in rice mill workers and to compare the values with healthy normal people.

Materials and methods : A total of 50 non-smoker male subjects were studied of which 25 were rice mill workers and 25 were healthy normal people, and they were in the age group of 20-40 years. The duration of exposure of the workers was 2-5 years with 8 hours of daily exposure. Persons having history of smoking, respiratory illness or cardiac dysfunction, any allergy, were excluded from the study. PEFR values were calculated using Mini Wright Peak Flow Meter. Three readings 2 minutes apart were taken. Highest value of the best three readings is taken. Statistical analysis was done using unpaired t-test keeping $p < 0.05$ as level of significance and data reported as Mean \pm Standard Deviation.

Results : The mean PEFR values were found significantly lower in study group compared to the control group, p value is < 0.001 and is considered highly significant.

Conclusion : Thus, chronic exposure to grain dust in rice mill workers decreases PEFR. So, periodic respiratory examination of workers and preventive measures may be taken to ensure better health outcome for better work performance.

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P/ RP /11

Correlation of Body Composition with Expiratory and Inspiratory Flow Rates

SWIKRUTI BEHERA, BIPIN BIHARI PRADHAN

Background : Flow rates are very important factors which affect the volume and speed at which air is moved into and out of lung. Body Mass Index and Waist Hip ratio are the most commonly used parameters now a days to assess obesity and the diseases associated with it. But both the

parameters have the limitation of not distinguishing between fat compartment and muscle compartment.

Objective : Hence this study was taken with the objective to show that which body composition parameter has highest correlation with flow rates."

Material and Methods : All anthropometric measurements such as age, sex, height and weight were recorded. The body fat percentage was measured by "Bioelectric Impedance" analysis technique using "OMRON BodyFat Monitor (HBF-306)". Pulmonary Function were recorded on a window based "Flowhandy ZaN 100 USB & ZaN. GPI. 3xx", Germany."

Results : PEF, PIF and MIF50 in males have highest positive correlation with FFM followed by FFMI. Other flow rates, MEF50 & MEF25-75 (MMEF) have very low correlation with every factor and are insignificant too.

Conclusion : Limited usefulness of BMI should be taken into consideration and FFM & FFMI should be used as reference variable. Measurement of FFM by "Bioelectrical Impedance" method is inexpensive, reliable, simple, safe and non-invasive technique for use in lung function laboratories.

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P/ RP /12

Comparative Study of Cell Counts in Induced Sputum of Asthma and COPD Patients in Indian Population

ANJALI TRIVEDI, MONICA CHANDAN, NASIM AKHTAR, RANDEEP GULERIA, DEBABRATA GHOSH, ANJANA TALWAR

Background : Asthma and COPD are characterised by airway inflammation and obstruction. Spirometry is used in early detection of airflow limitation and routine monitoring of disease, but it does not assess inflammation. The inflammatory processes in lungs are studied by bronchial biopsy and lavage, but these methods are invasive and cannot be used routinely. Therefore, a non-invasive method such as Induced sputum can be used as an alternate to sample inflammatory cells from airways.

Objective : To assess airway inflammation by induced sputum cell counts in Indian asthma and COPD patients.

Methods : Asthma (n=14) and COPD (n=16) patients underwent sputum induction with 4% hypertonic saline. Spirometry with reversibility was assessed for all patients. Sputum processing was done using standard protocol. Cell pellet was used for analysis of total and differential cell counts.

Results : TLC (10^6) of COPD patients (2.4 ± 2.1) was significantly higher compared to Asthma (1.0 ± 1.6). Sputum cell differential showed that neutrophils were predominant cells in airways of both COPD (63.4 ± 22.8) and Asthma patients (55.4 ± 25.7). Eosinophils were significantly higher in Asthma (26.3 ± 24.1) as compared to COPD patients (7.0 ± 3.3). Neutrophil to lymphocyte ratio in sputum of COPD patient was significantly higher compared to Asthma patients.

Conclusion: Induced sputum is safe and Non-invasive method to assess airway inflammation. It can be used to monitor airway inflammation in COPD and Asthma patients.

P/ RP /13

Effect of Chronic Intermittent Hypoxia (CIH) on Contractile Properties of the Geniohyoid (GH) Muscle

RAMAN GHAI, PREETI SOLANKI, ARUNABHA RAY, KRISHNAN RAVI

Background : In obstructive sleep apnea (OSA) patients, there is oxidative stress and increased collapsibility of the upper airway muscles. Whether the collapsibility is due to changes in their contractile properties are not fully investigated.

Objective : To study the effects of CIH on contractile kinetics, alterations in fiber-type distribution, and oxidative stress parameters in GH muscles in rats.

Material and Methods : Adult male Wistar rats were divided into 2 groups- Control (room air for 35 days, n=12) and CIH (2 min of 99% N₂ followed by 8 min of 21% O₂ per episode, 6 episodes/hr and 8 hrs/day, for 35 days, n=12). Subsequently, GH muscle was dissected and suspended vertically in organ-bath (37 °C), in Krebs-Henseleit solution (95 % O₂, 5 % CO₂, pH 7.4). It was attached to isometric force transducer and the effect of field stimulation on contractile properties of muscle was studied. Myofibrillar ATPase histochemical assay was used to quantify slow/type-1 and fast/type-2 muscle fiber types. Biochemical estimations of oxidative stress parameters were made.

Results : CIH decreased contraction time and half-relaxation time and increased muscle fatigue and its recovery from fatigue. It increased fast-twitch fatigable fibers (type-2) and decreased slow fatigue resistant fibers (type-1). It decreased GSH levels and increased lipid peroxidation.

Conclusion : The oxidative stress, alterations in some of the contractile properties and easy fatigability of the GH

muscles could contribute to the collapsibility of the upper airways reported in patients with OSA.

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P/ RP /14

Status of Pulmonary Functions in Bangle Factory Workers

SANTOSH KUMAR SANT, ANG HYDER

Background : The pulmonary function impairment is a common respiratory problem among industrial exposure.

Objective : Therefore, the present study was undertaken to evaluate the effects of furnace smoke and flue and its duration of exposure on lung function.

Materials and methods : This is a matched cross-sectional study of Spirometry in 100 bangle workers with age range 20 – 60 years, who worked without smoke control ventilation or respiratory protective devices. Pulmonary function tests were performed by using Digital Spirometer (Spiro-excel). Significant reduction was observed in the mean values of Forced Vital Capacity (FVC), Forced Expiratory Volume in one second (FEV1), Forced Expiratory Ratio (FEV1/FVC%), Forced Expiratory Flow (25% -75%) and Peak Expiratory Flow Rate (PEFR) in bangle workers relative to their matched controls.

Results : It is concluded that lung functions in bangle workers is impaired.

Conclusion : It is concluded that lung functions in bangle workers is impaired.

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P/ RP /15

Assessment of the cognitive function in chronic obstructive pulmonary disease patients (COPD)

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Background : COPD is associated with significant extrapulmonary abnormalities. Identifying and assessing relevant systemic effects are needed for better understanding and treatment of the disease. Cognitive dysfunction is one such important systemic effect with emerging clinical relevance.

Objective : To assess the cognitive function in chronic obstructive pulmonary disease patients (COPD).

Materials and methods : 30 subjects in the age group of 40 to 60 years of age, fulfilling inclusion and exclusion criteria were enrolled for study. Pulmonary function test was performed on clinically diagnosed mild to moderate COPD cases (n=15) as per GOLD criteria and healthy controls (n=15). Neuro-psychological test for cognitive function was done by using following tests - Letter Cancellation test, Trail making test A and B, Digit Span Forward and Reverse. Electrophysiological study for assessment of P300 variables was also performed. Statistical analysis was done using Graph Pad Prism Version 5 software.

Results : Compared to the controls, COPD patients showed significant impairment in letter cancellation test and trail making test B (p<0.05). Omission errors in the letter cancellation test was significantly more in cases. COPD patients had prolonged P300 latency in recordings at Fz and Cz (p<0.05). Amplitude significantly decreased in cases than controls in recordings at Fz, Cz and Pz (p<0.05).

Conclusion : Cognitive impairment was seen in COPD patients both by Neuro-psychological test and P300. Studies with larger sample size and prospective research design are suggested for further understanding the mechanism and effect of cognitive impairment.

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P8. Molecular Biology

P/ MB/1

Role of Sericin and its Amino Acids in Alleviating the H₂O₂ Induced Oxidative Stress in a549 cells.

ANN SANDHYA MICHEAL, M. V. V. SUBRAMANYAM

Background : Free radicals causes oxidation of proteins, lipids and damage to DNA. Sericin is a fractional protein in natural silk fibre and is removed during degumming process in the silk industry. This waste product is known for its antitumoral, antimicrobial and antioxidant properties.

Objective : The aim of the present study was to characterize the major constituents of sericin that may provide cytoprotective effect against hydrogen peroxide-induced cell damage in A549 cells.

Materials and methods : A549 cells were exposed to H₂O₂ (20 µM) for 10 min to induce oxidative stress. To evaluate the antioxidant nature of sericin, isolated cells were incubated with 28 mg/ml sericin for 10 min at RT prior to treatment with H₂O₂. The cells were also incubated with 0.5 mM each of L-serine and L-aspartic acid for 10 min at room temperature prior to treatment with

H₂O₂ to assess the role of amino acids as antioxidants. LCMS analysis were carried out on hydrophilic extract of sericin. Protein carbonyl level (PrC), malondialdehyde level (MDA), superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GPx) activities were measured. Intracellular ROS levels in A549 cells were measured with an ROS-sensitive indicator, CM-H₂DCFDA.

Results : LCMS analysis depicted higher concentration of hydrophilic amino acid in extracted sericin. A549 cells incubated with suboptimal concentration of hydrogen peroxide induced a significant increase in antioxidant enzymes (AOEs) and oxidative stress (OS) markers. Sericin as well as amino acid mixture inhibited the H₂O₂ induced increase in AOEs and OS markers. It also increased the antioxidant capacity in the cells studied. .

Conclusion : These results suggest that major constituent amino acids of sericin defend A549 cells against oxidative damage by scavenging reactive oxygen species rather than activating antioxidant enzyme system thereby inhibiting cell damage.

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P/MB/2

Validation of a Novel H₂S Probe for Detection of Hydrogen Sulphide in Plasma

BHAVITHRA BHARATHI, BENJAMIN JEBARAJ, NIRANJINI, VENKATESWARULU, SUBRATA GHOSH, SATHYA SUBRAMANI

Background : Hydrogen Sulfide (H₂S) is an emerging endogenous signaling molecule. It is endogenously produced from Cysteine and Homocysteine. Numerous probes have been developed for its detection. In this study, we want to assess the usefulness of one such probe that is specific and sensitive to H₂S.

Objective : To add the H₂S probe and quantify H₂S in plasma using fluorescence spectrophotometry

Materials and methods : "Construction of standard curve for reference: 5ml blood was collected from 5 healthy volunteers after obtaining informed consent, anticoagulated with heparin and centrifuged to obtain plasma. Ethanol and Dimethylsulphoxide were added to the plasma, as they are solvents for the H₂S probe and themselves caused precipitation. After centrifugation, clear plasma was placed in a vacuum chamber for half an hour to remove residual endogenous H₂S. One aliquot was left as blank and five aliquots were spiked with NaHS. Probe was added. After 16hrs incubation, fluorescence was assessed in a spectrofluorimeter. Excitation : emission wavelengths =

395:505 nm. To obtain test values, 5ml blood was collected from 5 healthy volunteers after informed consent, processed as described above but without removing endogenous H₂S. Only probe was added and fluorescence was assessed in a spectrofluorimeter after 16hrs incubation. Excitation : emission wavelengths = 395:505 nm.

Results : There was increase in fluorescence with increasing concentrations of NaHS. With the results obtained, a standard curve was constructed as reference to obtain the test values.

Conclusion : The dye is useful to detect and quantify H₂S in plasma. Once standardised, this method can serve as a laboratory method to detect and quantify H₂S in plasma.

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P9. Phytomedicine

P/PM/1

Hypolipidemic Effect of Ethanolic Extract of *Amorphophallus Campanulatus* against Ethanol Induced Hypolipidemia

SUBHASHREE BASU, MOUMITA DAS, ANURUPA SEN, GOURIPROSAD DATTA

Background : *Amorphophallus campanulatus*, belonging to the family of Araceae is a perennial herb commonly known as elephant foot yam. It is basically a tuber crop of South East Asian origin and is largely cultivated throughout the plains of India for using its corm (bulb) as food. The tuber is widely used in many Ayurvedic preparations, and prescribed in liver diseases, bronchitis, asthma and rheumatic swellings.

Objective : As there is no indication of publications regarding the anti-hyperlipidemia activity of the tuber, the present study was designed to investigate the anti hyperlipidemia activity of ethanolic extract of the tuber against ethanol induced hyperlipidemia.

Materials and Methods : Hyperlipidemia was induced by 40% ethanol at dose of 2gm/kg bwt along with normal diet in Wistar albino rats. Drugs were administered in two different dose levels (250mg/kg bwt, 500mg/ kgbwt).

Results : The results indicate significant (P < 0.05) lowering of elevated levels of TC, TG, VLDL and LDL in a dose dependent manner by the ethanolic extract of *Amorphophallus campanulatus* tubers while increasing (P < 0.05) the levels of HDL, thus improving the atherogenic index as compared to the ethanolic group. GC-MS analysis of the extract showed presence of phytosterols with natural statin like property which might account for such hypolipidemic effect of the extract.

Conclusion : The present study highlights the hypolipidemic property of *Amorphophallus campanulatus* tubers against ethanol induced hyperlipidemia, though further studies are required to gain more insight in to the possible mechanism of action.

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P/ PM/2

Protective Effects of Allium Cepa on Aspirin Induced Gastric Ulcers in Wistar rats

TATIYANA MANDAL, FORUM MEHTA

Background : Gastric ulcer associated with the use of aspirin is a major problem. Allium cepa commonly known as onions are an outstanding source of flavonoid polyphenols which are reported to have antisecretory and antiulcer effect on GIT.

Objectives : To evaluate the anti-ulcer effect of the ethanolic extract of Allium cepa bulb in aspirin induced gastric ulcer models in wistar rats.

Materials and methods : Ethanolic extract of the bulb of Allium cepa (AC) was prepared following standard procedures. Aspirin was administered orally in the dose of 500 mg/kg in 36 h fasted rats to induce ulcer. Six hours later, the animals were sacrificed and following parameters were assessed - ulcer index, number of ulcers, volume and total acidity of gastric secretion. Four groups (Group I – Control, saline 1ml/kg; Group II- Standard, famotidine 3.6 mg/kg; Group III- Test 1, AC extract 150 mg/kg; Group IV – Test 2, AC extract 300 mg/kg) consisting of six wistar rats each were used. All drugs were administered orally 1 hour prior to aspirin. Data was analysed using one way ANOVA followed by Bonferroni's post hoc test and p value <0.05 was considered statistically significant.

Results : Both famotidine and the extract of Allium cepa significantly (p<0.05) reduced the ulcer index, number of ulcers, volume of gastric acid secretion and total acidity as compared to control group.

Conclusion : Results of the study suggest that Allium cepa has anti-ulcer activity. It being widely used and easily available might play as an adjunct to the existing anti-ulcer drugs.

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P10. Life Style Modification

P/ LM/1

A Study of the Effect of Yoga on Heart Rate Variability and HOMA-IR in Early Postmenopausal Women

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Background: Postmenopause, an estrogen deficient state comes with its constellation of adverse health events especially CVDs and insulin resistance. Yoga has been described as having beneficial effect on HRV, a marker for cardiac autonomic activity which depicts cardiovascular risk and HOMA-IR, a marker for insulin resistance in various populations.

Objectives: To study the effect of yoga in modifying HRV and HOMA-IR in early postmenopausal women

Material and Methods: 67 women within 5 years of menopause between 45 and 60 years of age attending menopause clinic of Department of Gynaecology, Sucheta Kriplani Hospital fulfilling inclusion and exclusion criteria and consenting were enrolled for study. HRV and HOMA-IR were recorded on 37 cases (Yoga group) and 30 controls (Non-Yoga group) pre and 3 months post-intervention. Statistical analysis was done using Graph Pad Prism Version 5 software.

Results: In HRV, frequency domain analysis showed significant fall in LF(nu) and LF:HF ratio and significant rise in HF(nu), HF(ms²), LF(ms²), VLF(ms²) and Total Power(ms²) in Yoga group (depicting parasympathetic shift) against significant rise in LF(nu), LF:HF ratio and significant fall in HF(nu) in Non-Yoga group (indicating sympathetic dominance). Time domain analysis showed significant decrease in SDNN in Non-Yoga group against non-significant changes in Yoga group. Fasting Insulin and HOMA-IR significantly rose in Non-Yoga group against non-significant rise in these parameters in Yoga group.

Conclusion: 3 month long Yoga practice improved HRV and hence can attenuate CVD risk in postmenopausal women. Longer studies on larger sample size is recommended to further study effects of Yoga on our population.

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P/LM/2

Effect of Aerobic Training on VO₂ Max and Other Physiological Parameters in Working Women

SUDHA KARADKHEDKAR, N D SOMWANSHI

Background : Low level of aerobic fitness is an inevitable consequence of physical inactivity and sedentary lifestyle that some experts state to be the most important public health problem of the 21st century. Working women have more stress than nonworking women. Increasing amount of work stress at home and also at work place. The concept of aerobic exercise for reducing anxiety & improving cardio respiratory parameters has created a great interest in medical research field

Objectives : The present study was conducted to assess the effect of 16 weeks of aerobic exercise on different physiological parameters like pulse rate, respiratory rate, systolic blood pressure, diastolic blood pressure, breath holding time and VO₂ max (Maximal Oxygen Consumption).

Material and Methods : assess the effect of 16 weeks of aerobic exercise on different physiological parameters like pulse rate, respiratory rate, systolic blood pressure, diastolic blood pressure, breath holding time and VO₂ max (Maximal Oxygen Consumption). Thirty healthy young adult female subjects between age 30 to 45 years were selected for study. Subjects practiced aerobic exercise at least 5 days a week. VO₂ max was calculated by Queens college step test, pulse rate by palpatory method, respiratory rate and breath holding time visually, systolic and diastolic blood pressure by mercury sphygmomanometer. All parameters were calculated before and after 16 weeks of aerobic training program.

Results : Study demonstrated that 16 weeks of aerobic training produced favorable changes in all cardiovascular parameters.

Conclusion : A aerobic exercise session of even 16 weeks showed positive impact on physical and psychological functioning of working women. It is expected that consistent and more prolonged similar sessions will lead to more significant changes.

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P/LM/3

Yoga-based Lifestyle Intervention reduces Oxidative Stress in Subjects with Metabolic Syndrome

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SANKALP**

Background : Metabolic syndrome is a risk factor for cardiovascular disease and diabetes, which may be mediated through oxidative stress. Oxidative stress levels are elevated in metabolic syndrome, and may be improved with various lifestyle interventions.

Objectives : To evaluate the changes generated in the biomarkers of oxidative stress in subjects metabolic syndrome after yoga-based lifestyle intervention for 12 weeks.

Material and Methods : A total of 130 subjects with metabolic syndrome aged 20-45 years were assigned to yoga-based lifestyle intervention group for two weeks at Integral Health Clinic, Department of Physiology, AIIMS, and further followed at home for 12 weeks. The main outcome measures were plasma levels of thiobarbituric acid reactive substances, 8-hydroxy deoxyguanosine and superoxide dismutase. These biomarkers of oxidative stress were assessed at baseline, 2 weeks and 12 weeks in intervention group.

Results : After 12 weeks of intervention, yoga-based lifestyle intervention group showed overall statistically significant decrease in plasma levels of thiobarbituric acid reactive substances ($p < 0.0001$), 8-hydroxy deoxyguanosine ($p = 0.0468$) and increase in antioxidant superoxide dismutase levels ($p = 0.0488$).

Conclusion : The result suggests that 12 weeks of yoga-based lifestyle intervention reduces oxidative stress levels and increases antioxidant in subjects with metabolic syndrome.

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P/LM/4

Effect of OM meditation on Memory

**MANISH KUMAR, ASHA GANDHI, RAJ KAPOOR,
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Background : Meditation can act as an effective way for the enhancement of various domains of the cognitive function such as Executive function, Attention, Memory and Visual-spatial skills. Studies using SPECT, PET and fMRI as an investigational tool shows that practice of

meditation brings about changes in the pattern of the neurotransmitter release, increase blood flow, glucose consumption mainly in the areas of the brain concerned with cognitive function.

Objectives : To study the effect of OM meditation on Memory in younger population.

Material and Methods : The study was conducted on MBBS student in the age group 17-22 years of LHMC, New Delhi. Subjects were divided into two groups one being the meditating group (Group 1) and the other being the control group (Group 2). Verbal, visual and working memory were assessed with Rey's Auditory Verbal Learning Test (RAVLT), Rey's complex figure test (CFT) and Wechsler Memory Scale (WMS) – spatial span and Stroop test respectively at the beginning and at the end of 12 weeks.

Results : Meditation group improved significantly in RAVLT: Total score, average, immediate recall and delayed recall; CFT: delayed recall; spatial span - forward and backward when compared with control group at the end of 12 weeks signifying better memory in those who practiced meditation.

Conclusion : We reached to a conclusion that even practicing a single limb of yoga regularly it may have beneficial effect on memory.

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P/ LM/5

Pulmonary Functions in Yoga practitioners, athlete and sedentary males

ROSEMARY PETER, SUSHMA SOOD

Background : In this busy age prevalence of sedentary life style is increasing and so are the associated lifestyle disorders. Now-a-days, people are interested in physical fitness than any time before. Health and physical fitness depend highly on cardio-respiratory efficiency of an individual. Lung function parameters tend to have a relationship with lifestyle. Hence the present study was under taken to assess the effects of yoga and exercise in yoga practitioners and athletes on respiratory system and compared with sedentary group.

Objectives : Aim of study was to determine if yoga and athletic activity (running) are associated with better lung functions as compared to subjects with sedentary lifestyles and how does athletes and yogis differ in lung function.

Material and Methods : Spirometric parameters were assessed in randomly selected 300 healthy male, non-smoking, non-obese subjects- athletes, yogis and sedentary workers. The parameters used as determinants of lung function were FVC, FEV1, FEV3, PEFR, FEF 25-75%, FEV1/FVC ratio and MVV.

Results : Pulmonary Function Profile was analyzed and compared among the study groups. In present study the

yoga and athletic groups were having higher mean values of FVC, FEV1 and FEV3 as compared to sedentary group. The yoga and athletic groups differed significantly in PEFR and MVV. The highest mean PEFR and MVV were observed in yoga practitioners. Yogis and athletes had similar lung functions except for better PEFR amongst yoga practitioners.

Conclusion : All pulmonary function parameters were higher in athletes and yoga practitioners as compared to the sedentary individuals. This study suggests that regular exercise has an important role in determining and improving lung functions.

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P/ LM/6

Comparative Study of Pulmonary Function Test in Yoga Trained and Untrained School Going Boys

ASHWATHY V T, R S KOUJALAGI, S Y BONDADE

Background : Yoga comprises of physical postures and breathing exercises which claims to improve muscle strength, flexibility, blood circulation, oxygen uptake, thoracic compliance. Despite a growing body of clinical studies and systematic reviews on therapeutic effects of yoga, there is still a lack of solid evidence regarding its clinical relevance. In this study we are comparing various pulmonary function parameters in yoga trained and untrained school going boys.

Objectives : We studied the effect of six months yoga training on respiratory functions in school going boys.

Material and Methods : A cross sectional study involving 40 yoga trained and 40 yoga untrained school going boys aged 11 - 15 years were considered. Pulmonary Function tests were carried out using a computerized spirometer, HELIOS 401 MEDSPIROR (SPIROLYSER). Height in centimeters, weight in kilograms and personal information like age, sex and brief history of all subjects were entered in the patient information chart. FVC, FEV1 and PEFR volumes were recorded.

Results : Mean value of FVC (3.06 ± 0.44 Vs 1.82 ± 0.55 , $p < 0.000$), FEV1 (2.79 ± 0.46 Vs 1.46 ± 0.38 , $p < 0.000$) and PEFR (3.31 ± 0.47 Vs 1.88 ± 0.49 , $p < 0.000$) is significantly higher ($p < 0.000$) in yoga trained when compared to untrained boys.

Conclusion : Six months yoga training showed an increase in forced vital capacity due to improvement in lung compliance. Also there was improvement in FEV1 and PEFR suggestive of decreased airway resistance due to reduction in resting muscle tone.

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P/ LM/7

Can sauna baths supplement dialysis in CKD patients for fluid removal?

**NIRANJINI C, ABIRAMI V, BENJAMIN D,
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Background : Chronic renal failure is a burgeoning problem especially in countries like ours with resource constraints. Increase in ECF volume due to poor compliance to fluid and salt restriction is a huge problem in haemodialysis patients. Stimulated sweating like sauna baths can be a cost effective and simple way to control excessive fluid accumulation and hence reduce frequency of dialysis sessions and also improve the lifestyle of patients in terms of less rigid fluid and salt restriction.

Objectives : To conduct a pilot study and make a preliminary assessment of the fluid and electrolyte status before and after a session of sauna bath at moderate temperatures in healthy volunteers. To estimate the sample size required to extrapolate this study to patients with chronic renal failure undergoing dialysis.

Materials and methods : After obtaining informed consent, healthy volunteers were subjected to sauna bath lasting for 30 minutes at 50° C .The following parameters were estimated before and after sauna- body weight, blood pressure, serum potassium, serum sodium, serum bicarbonate, haematocrit , serum calcium.

Results : It was found that there was significant decrease in weight after each session of sauna bath. There was no significant change in serum sodium, bicarbonate, haematocrit. Serum potassium showed a trend towards increase.

Conclusion : The decrease in weight favours sauna bath as an effective way to control ECF volume. However, the increase in serum potassium levels must be borne in mind when extrapolating this study to chronic renal failure patients in whom potassium levels are already higher.

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P/ LM/8

Assessment of upper and lower limbs muscle strength in female bharathanatyam dancers and nondancers

JYOTHI S, B SUJAYA

Background : Bharathanatyam is an Indian classical dance form which involves rhythmic dance movements. It

involves various positions to attain which Dancers require adequate Muscle strength in Lower and Upper limbs.

Objectives : To assess Lower limb and Upper limb Muscle strength in Female Bharathanatyam Dancers and Nondancers

Material and Methods : 32 Dancers and 33 Nondancers were assessed. The Lower limb muscle strength was assessed by Hop test and Wall sit test. In Hop test, subjects hopped a distance of 6 metres with Right and Left limbs and time taken was recorded in seconds. In Wall sit test, subjects sat down against wall with hip and knee joints, knee and ankle joints in straight line. Total time was recorded in seconds. The Upper limb muscle strength was assessed by Modified Push ups test where subjects performed Push ups with knees resting on the floor and moving elbows to ninety degrees.

Results : The Independent Sample T test was applied. Dancers took a significantly lower time to Hop compared to Nondancers with $P < 0.001$. Dancers performed Wall sit test for a significantly longer duration compared to Nondancers with $P < 0.001$. Dancers performed significantly higher number of Push ups compared to Nondancers with $P < 0.001$.

Conclusion : The Lower and Upper limbs Muscle strength of Dancers was better than that of Nondancers. The dance practice routine has improved the muscle strength of dancers. The change in muscle strength with number of practice years requires further evaluation.

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P/ LM/9

Can the regularly supervised training of Pranayama and Omkar Meditation affect the Cardio-respiratory parameters and short-term memory of mentally challenged people

KUNAL, SANJAY KUMAR, BHAWNA THAPA

Background : Yogic practices are known to affect the cardiac, respiratory and mental status of normal people. Not enough efforts have been made to find out its usefulness in mentally challenged young adults.

Objectives : To investigate if the regularly supervised training of pranayama and meditation affect the basic cardio-respiratory parameters and short-term-memory (STM) of mentally challenged young adults.

Material and Methods : 80 mentally challenged young adults attending a special school were randomly and equally allotted to control and Yoga group. Yoga group

performed Naadishodhan, Kapalbhathi pranayama and Aum Chanting under a total supervision for 30 minutes daily for 3 weeks. Control group was let to continue with the regular school curriculum. The parameters were measured twice, before (baseline) and after (follow-up) the study period. STM was evaluated under two subcategories, first by the ability to repeat the numbers in reverse order and second, repeating the words in the same order. Respiratory rate, pulse, systolic and diastolic blood pressures were measured as cardio-respiratory parameters.

Results : Both groups were comparable in their each of baseline scores. At follow-up, highly significant improvements were observed in respiratory rate, pulse and both the sub-categories of STM in Yoga group as compared to control. Respiratory-rate and pulse decreased but remained within normal range. However, both systolic and diastolic blood pressures of Yoga group showed no changes as compared to control.

Conclusion : The pranayama and meditation has beneficial influences on heart rate, breathing rate and STM of mentally-challenged people.

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P/ LM/10

Effect of Life Style Changes on Autonomic Functions

ARPANA HAZARIKA, ARCHANA SARMA

Background : Autonomic function is influenced by obesity and life style factors. Emotional stress, anxiety, smoking, alcohol tend to increase sympathetic activity and on the other hand meditation, yoga and other relaxation techniques increase vagal tone and reduces blood pressure and heart rate

Objective : To establish relation of life style on autonomic function

Material and Methods : The study was carried out among staff of gauhati medical college in the age group 20 to 58 years.

For parasympathetic function

1. Deep breath test
2. Valsalva test

For sympathetic function

1. Hand grip test
2. Orthostatic hypotension test

Results : In comparison to sedentary life style the parasympathetic activity was significantly increased in active life style p value < .05. Though sympathetic Functions

were raised in sedentary life style it was not found to be statistically significant.

Conclusion : In today's world of anxiety and stress it is seen that meditation and yoga and other stress relaxation techniques help reduce heart rate and blood pressure. Sedentary life style and unhealthy food habits increase sympathetic tone and greatly increase risk of cardiovascular disease"

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P/ LM/11

To study the effect of anulom-vilom and modified anulom-vilom in bronchial asthma

MANADAVI, SUSHMA GUPTA, MANADAVI, SHIV SAGAR GUPTA, ABDUSSALAM, EQBAL ANWER, NITIN PANDEY, DILSHAD ALI

Background : Bronchial Asthma is a burning problem of modern civilization which has prompted excessive use of automobile causing toxic gaseous abuse to respiratory system and critically causing bronchial irritation precipitating bronchial asthma in young and adults equally.

Objective : This prompted us to undertake this study know whether there is any change in Pulse Rate, Respiratory Rate, FEV1, FVC, FEV1/FVC%, PEFR, in the asthma patients practicing Anulom Vilom pranayama and Dr Sushma Gupta's Modified Anulom Vilom pranayama

Material and Methods : Twenty four patients of asthma were randomized into two groups Group A (Anulom Vilom group) and Group B (Dr Sushma Gupta's Modified Anulom Vilom group) of twelve patients each. Pulmonary function tests were performed and parameters like pulse rate, respiratory rate, FVC, FEV1, FEV1/FVC% and PEFR were compared after 4, 8 and 12 weeks. Statistical analysis is done by SPSS software using Repeated Measures One Way ANOVA test and Post hoc test with p value < 0.05 considered as significant

Results : Pranayama practices resulted in significant improvement in pulmonary function tests; decrease in respiratory rate; decrease in pulse rate and decrease in frequency of asthma attacks and decrease in frequency of use of inhalers and improvement is statistically more significant in Dr Sushma Gupta's Modified Anulom Vilom than Anulom Vilom.

Conclusion : This is concluded that Pranayama can be used adjunctively with standard pharmacological treatment significantly improves pulmonary functions in patients with bronchial asthma

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P/LM/12

Changes in auditory and visual reaction times due to aerobic exercises

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Background : Measurement of reaction times is a common method to evaluate psychomotor fitness. The beneficial effect of aerobic exercises on psychomotor performance remains debatable.

Objectives : Hence, the present study was undertaken to determine the changes in auditory reaction time (ART) and visual reaction time (VRT) due to aerobic exercises

Materials and methods : This prospective study was conducted in 50 healthy subjects. Group A consisted of subjects who were not exercising (n=25) and group B consisted of subjects doing regular aerobic exercisers (n=25). ART and VRT were recorded using digital display response time apparatus having three lights and three auditory stimuli. The readings for low, medium or high pitch sound were denoted as ART1, ART2 and ART3 respectively, The readings for red, yellow and green color were denoted as VRT-R, VRT-Y and VRT-G respectively.

Results : The ART was significantly lower in the group doing regular aerobic exercisers (313.33 ± 8.160) as compared to group who were not exercising (573.09 ± 17.950). Similarly, VRT of the group doing regular aerobic exercisers was significantly lower (318.24 ± 6.709) as compared to group B who were not exercising (505.73 ± 16.961).

Conclusion : There is improvement in auditory and visual reaction times due to aerobic exercises.

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P/LM/13

Effect of Swimming on Cognition in Elderly

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Background : Previous studies report reduced risk of cognitive impairment in elderly who maintain higher levels of physical activity. Many studies also have proven that swimming has beneficial effect on orthopedic and cardiovascular health. But studies to assess effects of swimming on cognitive health of elderly are lacking.

Objective : To assess and compare the level of cognition among elderly swimmers and non swimmers.

Materials and methods : 40 elderly subjects who regularly swim and 40 elderly non swimmers were recruited based on inclusion and exclusion criteria. Ethical

committee clearance and written informed consent was taken. General physical examination was done. Cognition test for four domains - speed, attention, executive functions and working memory were performed with Digit symbol substitution test, Digit vigilance test, Category fluency and Verbal N back test respectively. Results were statistically analyzed using students t test.

Results : Total time taken for Digit Symbol Substitution Test by swimmers and non swimmers were 219.25 ± 29.07 and 231.02 ± 18.8 with P value 0.06. Time taken for Digit vigilance test by swimmers and non swimmers were 513 ± 13.9 and 525 ± 12.86 with P value 0.00048. Number of names in Category fluency by swimmers and non swimmers were 11.27 ± 1.25 and 9.97 ± 1.31 with P value 0.0005. Number of hits in 1 back and 2 back test by swimmers was 8.05 ± 0.79 and 6.97 ± 0.65 , by non swimmers was 7.27 ± 0.81 and 6.16 ± 1.02 with P value 0.0004 and 0.0006 respectively. P value ≤ 0.05 was taken as significant. Elderly swimmers had performed better than non swimmers on the attention, executive functions and working memory.

Conclusion : Swimming has a beneficial effect on cognition in the elderly and helps in reducing the age related cognitive decline.

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P/LM/14

Fish Oil Diet Could Improve the Neurosensorial Deficit and Oxidative Damage in Streptozotocin Induced Diabetic Rats

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Background : Diabetes is known to be increasing in epidemic proportions. Fish oil, which contains Omega 3 Poly Unsaturated Fatty acids, offer simple supplementary diet for diabetic patients.

Objective : To assess the effects of Treatment with Fish Oil on cognitive function among the diabetic rats.

Materials and methods : Male, Wistar rats of 2-3 months old were divided into non diabetic controls, diabetic control, & fish oil treated diabetic rats (n=6). Diabetes was induced by injection of STZ (48 mg/kg, ip). Animals were treated orally for 30 days with a dose of 0.5g / kg/day of fish oil. All experiments conducted after ethical committee clearance was obtained. Open field test for exploratory behavior and anxiety, passive avoidance test and biochemical estimation of MDA levels and Total antioxidant levels were analysed.

Results : Memory and exploratory behavior were improved ($p < 0.01$) in fish oil treated rats as compared with

diabetic rats. A significant ($p < 0.001$) decrease in MDA and a significant increase ($p < 0.001$) in total antioxidant level (TAO) were observed in fish oil treated rats.

Conclusion : From the findings of this study, we conclude that Omega 3 PUFA present in fish oil could be an adjuvant therapy for treatment and prevention of neurosensory impairment in diabetes mellitus.

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P/ LM/15

Efficacy of a Short-Term Yoga Based Lifestyle Intervention in reducing Framingham Risk Score

**RITESH NITAM, RASHMI YADAV,
KUMAR SARVOTTAM, RAJ KUMAR YADAV**

Background : Framingham Risk Score (FRS) is gender and age specific that predicts the risk of development of coronary heart disease in 10 years. Studies have shown that most of the risk factors are due to adverse life style and can be modified by life style interventions.

Objectives : To assess the efficacy of a short-term-yoga based lifestyle intervention in prevention of coronary artery disease using FRS and 10-year CHD risk as outcome variables.

Material and methods : A total of 396 subjects were recruited in the study. A short-term yoga based intervention for 10 days was administered to participants under direct supervision of yoga therapist and medical experts. Blood pressure with smoking history was recorded at 1st & 10th Day of intervention. Total cholesterol & HDL were also estimated.

Results : After this short-term intervention, FRS was significantly decreased in both male and female ($p < 0.001$). However, it was observed that 10-Year Risk % was decreased only in male subjects ($p < 0.01$).

Conclusion : A short-term-yoga based lifestyle intervention program might prevent CAD as evident by decrease in FRS.

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P/ LM/16

Student Counselling-Influence of Stress in Medical Students Cognitive Functions

PADMA RAMACHANDRAN

Background : Anything that poses a challenge or a threat to our well-being is a stress. Some stresses get you going

and they are good for you - without any stress at all many say our lives would be boring and would probably feel pointless. However, when the stresses undermine both our mental and physical health they are bad.

Stress is defined as the condition in which plasma ACTH secretion is high. The stimuli that increase ACTH secretion are called stressors. There are different levels of stress and the high levels can be intrinsic or extrinsic.

Objective : Stress management in students

Materials and methods : Medical history, Questionnaire method and other standard memory tests were used.

Results & Conclusion : Stress relaxation technique helps in stress management in students, student counselling. Once stress period is over, cognitive abilities return to normal.

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P11. Pharmacology

P/Ph/1

Potential Drug-Drug Interactions among Hospitalized Cardiac Patients

AJAY D SHANBHAG, HEMA N G

Background : Drug Drug Interaction (DDI) is of major concern in patients with complex therapeutic regimens. Patients with cardiovascular disorders, in particular, are at higher risk of DDI due to the increased number and multiple classes of drugs they receive.

Objective : To identify potential drug-drug interactions among hospitalized cardiac patients and to identify the risk factors associated with these interactions.

Materials and methods : After obtaining approval from Institutional Ethical Committee, a prospective observational study was carried out among 367 hospitalized cardiac patients in a tertiary care hospital, Mysore. Cardiac patients prescribed at least 2 drugs and having hospital stay of more than 24 hour duration were enrolled into the study. The prescriptions were analysed for potential DDI using computerized DDI database system (MEDSCAPE). Descriptive statistics, Chi-Square test and Cramer's V test were used to analyse the results.

Results : The incidence of pDDI was 98% with 360 patients having at least one interacting drug combination. 67 subjects with serious (18.2%), 346 with significant (94.3%) and 141 with minor (38.4%) interactions were identified. Aspirin/clopidogrel (71.1%) and pantoprazole/clopidogrel (69.8%) were the most common interacting pairs. Drugs most commonly involved were aspirin, clopidogrel, heparin, pantoprazole and ramipril.

Majority of interactions were pharmacodynamic (78.6%) in nature. Increased number of medicines, prolonged hospital stays and comorbid conditions were the risk factors found associated with the potential DDI.

Conclusion : This study emphasizes the need to exercise caution during therapeutic planning and to intensely monitor the cardiac in-patients to avoid dangerous consequences as a result of DDIs.

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P/ Ph/2

A Randomized Comparative Study of 0.2% Levobupivacaine with 25µg fentanyl & 0.2% Ropivacaine with 25µg fentanyl For Postoperative Analgesia in lowerlimb surgery patients.

**SANTHOSH KUMAR.R, BASAVANNA P.L.
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Background : Levobupivacaine & Ropivacaine were developed mainly to overcome the fatal cardiotoxicity that can occur with bupivacaine.

Aim : This study is aimed to compare the efficacy & safety of 0.2% levobupivacaine with 25 µg fentanyl & 0.2% ropivacaine with 25µg fentanyl in patients undergoing lower limb orthopaedic surgeries.

Objective : The objectives were to record and compare: onset peak duration of the postoperative analgesia using visual analogue scale (VAS) & hemodynamic parameters- blood pressure, heart rate.

Materials and methods : After obtaining the institutional ethical committee approval, 60 patients (calculated using prevalence 0.04) belonging to American society of anaesthesiologists (ASA) grade I & II of both sexes of age within 20-60 years were included. Study was conducted for a period of one year at K.R.hospital Mysore. For each patient written informed consent was obtained. Patients were randomly divided into 2 groups (using computer generated numbers) group-A which received 8ml of 0.2% levobupivacaine with 25µg fentanyl & group-B which received 8ml of 0.2% ropivacaine with 25µg fentanyl. Post operatively when patient complained of pain (VAS score >4), 8ml of test drug combination was given epidurally & the parameters were recorded periodically until the pain reappeared (VAS score >4). Statistical tests used were t- test (paired & unpaired) repeated measures ANOVA using SPSS version 20.0.

Results : Demographic profile, mean duration of surgery, hemodynamic parameters were comparable in both groups. The onset, peak, duration of analgesia in levobupivacaine group is 4.20+/-1.375mins, 29.70+/-4.78 mins, 325+/-16

mins and in ropivacaine group is 3.13+/-0.973 mins, 21.80+/-2.722mins, 210+/-24.914 respectively and is statistically significant

Conclusion: 0.2% levobupivacaine provides better post operative analgesia with similar haemodynamic stability compared to 0.2% ropivacaine.

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P/ Ph/3

Number of Antiepileptic Drugs and Adverse Drug Reactions in Indian Persons with Epilepsy: Are They Related?

**PRAFULL MOHAN, MANJARI TRIPATHI,
YOGENDRA KUMAR GUPTA**

Background: Epilepsy has a prevalence 572.8 (509.79-641.54) per 100,000 in India. Antiepileptic drugs (AEDs), single or in combination, are the mainstay of treatment. Almost 50% persons with epilepsy (PWEs) experience mild to moderately adverse drug reactions (ADRs) due to AEDs.

Objective : The present study observed the relationship between number of AEDs prescribed and the ADRs reported by PWEs.

Material and Methods This was an open label, cross sectional, observational study conducted at a tertiary care centre which caters to a large population from different regions of India. Adult PWEs (18 -65 years), on stable AEDs for at least past 6 months were included. Data on ADRs was collected using Liverpool Adverse Effect Profile (LAEP).

Results The number of AED varied from one to three. The entire patient cohort was divided into 3 groups viz PWEs taking monotherapy, 2 AEDs and > 2 AEDs. These groups were similar in terms of baseline characteristics and for cardiometabolic parameters. All PWEs (except one) reported at least one ADR. Average LAEP score among the entire PWE cohort was 36.1+7.9. LAEP score increased with the number of AEDs (34.2 ± 7.4 for one AED vs. 37.1 ± 7.4 for two AEDs vs. 39.1 ± 8.9 for > 2 AEDs). However the difference in LAEP score was statistically not statistically significant.

Conclusion Number of AEDs prescribed to a PWE might not directly imply a higher number of ADRs. Larger studies are needed to assess if it is a function of a particular combination of AEDs. Patients need to be sensitized to the importance of treatment adherence even in the face of ADRs.

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P/ Ph/4

Protective Effect of Chrysin against Seizures and Cognitive Impairment in Pentylentetrazole-Induced

**SUNIL KUMAR, P PRABHAKAR, KH REETA,
YK GUPTA**

Background: Chrysin is naturally occurring flavone. It possesses antioxidant, anti-inflammatory, anti-apoptotic and neuroprotective properties. These properties offer potential benefits in seizures and its complications

Objective: The present study evaluated the effect of chrysin against seizure, seizure-induced cognitive impairment and oxidative stress in pentylentetrazole (PTZ)-induced seizures

Material and Methods: After approval from animal ethics committee, AIIMS, New Delhi, male Wistar rats (200-225 g) were randomly divided into six groups. Chrysin was administered in doses of 30, 60 and 120 mg/kg (once a day, p.o). Valproate (300 mg/kg, i.p) was used a standard, 2% DMSO was given as vehicle. Drugs/vehicle was administered for 28 days. PTZ (60 mg/kg, i.p.) was administered on day 28. Morris water maze (MWM) and elevated plus maze (EPM) test were done to assess cognitive impairment. Oxidative stress was evaluated by measuring malondialdehyde, nitric oxide and super oxide dismutase levels in cortex, hippocampus and striatum of brain.

Results: As compared to PTZ group, chrysin delayed the onset of myoclonic jerks as well as generalized tonic clonic seizures (GTCS) in a dose-dependent manner. The duration of GTCS was also decreased with chrysin pretreatment. PTZ caused significant increase in the latency to enter and decrease in the time spent in the target quadrant in MWM test and significant increase in retention transfer latency in EPM. These effects were reversed with chrysin. Increased oxidative stress caused by PTZ was prevented by chrysin dose-dependently."

Conclusion: This study demonstrates that chrysin ameliorates seizure, seizure- induced cognitive impairment and oxidative stress in PTZ-treated rats

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P/ Ph/5

Dapsone Induced DRESS in Leprosy - A Rare Case Report

**DUA M, DUA S, CHOUHAN O, GEHLOT A, SINGH
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Objective : To study the hypersensitivity manifestations of Dapsone in Leprosy.

Introduction : Leprosy also known as Hansen's Disease. Dapsone is one of the most important component of multi drug regimen used in leprosy. Drug reaction with eosinophilia and systemic syndrome (DRESS) is a delay type of hypersensitivity reaction that typically occur in 2-6 weeks after the initiation of an offending medication. Dapsone is one of them. The risk of developing DRESS with in 60 days was estimated to be 2.3-4.5/10,000.

Case report : A 32 year male who was clinically and histopathologically diagnosed as a case of lepromatous leprosy and patient was started with multi drug regimen of leprosy. After 3 weeks of initiation of therapy patient developed nodular lesions all over the body with history of fever, joints pain, after one week nodular lesions necrosed and developed into deep ulcer.

Result : Patient was diagnosed as DRESS. Dapsone was withdrawn and patient is treated with Dexamethasone and supportive treatment.

Conclusion : DRESS incidence is increasing now a days and patient presenting with deep ulcer associated with Dapsone is a rare case presentation and condition of the patient improved after drug withdrawal.

P/ Ph/6

Effect of Metformin on serum calcium, alkaline phosphatase and parathormone in postmenopausal non diabetic osteoporotic women: an interim analysis

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Background: More than 200 million people suffer from osteoporosis and 30 % are females. Longevity of life, hormonal imbalance and decreased calcium intake are major risk factors in females for osteoporosis.

Objectives: To determine the effects of Metformin on serum calcium and other biochemical markers in non-diabetic post menopausal women with osteoporosis

Materials and methods: A Prospective, randomized, open-label clinical study was conducted in non diabetic post menopausal women (40-65 years) with osteoporosis. A total of 40 patients meeting inclusion criteria were equally divided into 2 groups. Interventional group of patients were given Metformin 500mg OD orally as add on treatment for a period of 6 months. Patients of non-interventional group were not given Metformin and were followed for a period of 6 months. All patients in both the groups were continued with their standard treatment of osteoporosis during study period. Patients were assessed at

baseline and 6 months for any response on serum calcium, alkaline phosphatase and parathormone.

Results: The increase in serum calcium level was higher in metformin group at the end of 6 months. The difference is not statistically significant (p value=0.71). The serum level of alkaline phosphatase was elevated in non-metformin group at baseline, but after six months of intervention decrease reported was greater in Metformin group (Statistically non-significant, p value=0.23). The difference in level of PTH in both the groups is statistically significant (p value=0.01). It was consistently increased in Metformin group (22.5±0.69 at baseline and 24±0.74 at six months)

Conclusion: Present study revealed that Metformin treatment as add on treatment for osteoporosis increased Calcium level and decreased alkaline phosphatase level as treatment given for a period of 6 months although changes were statistically non-significant. The PTH level was also increased more in metformin group. There is need for long term prospective study for better recommendations.

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P/ Ph/7

Efficacy and Safety of Garenoxacin versus Moxifloxacin in Acute Exacerbation of COPD: A Comparative Study

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Background : Acute exacerbation of COPD (AECOPD) is the major cause of morbidity, mortality and marked reduction in quality of life and imposes significant burden on both patients and healthcare systems. Bacterial infections causing AECOPD frequently require antibacterial treatment. More evidences are needed to guide better antibiotic choice.

Objectives : This study was planned to compare efficacy and safety of Garenoxacin, a new fluoroquinolone versus moxifloxacin for treatment of AECOPD.

Materials and methods : This was a prospective open label comparative study done in department of pharmacology and T.B & chest of GMC Haldwani. 100 subjects with clinical symptoms suggestive of Anthonisen type II AECOPD (any two of following criteria: Increased dyspnea, cough, sputum purulence) were enrolled and randomized to receive either Garenoxacin 400 mg once daily for 7 days or Moxifloxacin 400mg once daily for 7 days. The primary outcome measure was clinical success rate at day 14 visit. Secondary outcome measures were changes in clinical global impression (CGI) scales and incidence of adverse events.

Results : The mean age of patient was 60.97±11.48 year in Garenoxacin group and 57.87± 10.57 year in Moxifloxacin group. The clinical success rates were comparable with 94.9% in garenoxacin group and 92.4% in moxifloxacin group. Adverse effects were mild and self limiting. We observed two adverse effects in garenoxacin and three in moxifloxacin group.

Conclusion : The result of study shows that garenoxacin is comparable to moxifloxacin in terms of efficacy and tolerability .

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P/ Ph/8

Effect of Pioglitazone in Scopolamine Model of Learning and Memory Impairment

RACHNA GUPTA , LALIT K GUPTA

Background : Pioglitazone is a Peroxisome proliferator-activated receptor-gamma (PPAR- γ) agonist (thiazolidinediones), which is widely prescribed for the treatment of type II diabetes mellitus. PPAR- γ agonists have shown neuroprotective effects in neurodegenerative disorders.

Objectives : This study investigated the effect of pioglitazone, on learning and memory impairment in scopolamine model in mice, a model of Alzheimer's disease.

Material and Methods : Scopolamine was administered in the doses of 1mg/kg intraperitoneally (i.p.). Pioglitazone was given in the doses of 20 and 40 mg/kg intraperitoneally. For learning and memory impairment passive avoidance apparatus and Morris water maze test were used to measure step-down latency and escape latency, respectively.

Results : Scopolamine produced significant reduction in step-down latency and prolongation of escape latency showing learning and memory impairment in mice. Pioglitazone (20 and 40 mg/kg, i.p.) showed significant dose-dependent improvement in scopolamine induced dysfunctions in learning and memory in passive avoidance and Morris water maze tests, when administered for 21 days.

Conclusion : Pioglitazone has protective effects against scopolamine induced learning and memory impairment and therefore, has a therapeutic potential in Alzheimer's disease.

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Vasodilatation by Phenylephrine

RENU RAJ R, SATHYA SUBRAMANI

Background : Phenylephrine is an alpha 1 adrenoceptor agonist that leads to IP₃ mediated Ca release from sarcoplasmic reticulum, producing vasoconstriction. PE is also reported to produce vasorelaxation under some circumstances – through beta 2 or alpha 1D mediated mechanisms. We report that PE mediates vasorelaxation in the presence of L-arginine. This phenomenon is dependent on NO synthesis and requires activation of alpha receptors.

Objective : To prove the mechanism of PE-induced vasorelaxation.

Materials and methods : Small artery isolated from goat limb was made into a spiral strip and was superfused with physiological solutions at 37 deg Celsius. Tension was recorded using force transducer connected to Powerlab.

Results : Addition of phenylephrine (10µM) after L-arginine(400µM) reduced vascular tension by 68.1± 24%. There was reversal of tension after washout of phenylephrine with physiological salt solution

In the presence of L-NNA(1 mM), a reversible eNOS inhibitor, phenylephrine failed to produce relaxation following L-arginine.

In the presence of phentolamine, an alpha blocker, phenylephrine couldn't produce vasorelaxation following L-arginine.

Conclusion : Phenylephrine acts via alpha 1 subtype to induce relaxation in the presence of L-arginine is nitric oxide dependent. Clinical significance is that in septic shock where there is high NO production, vasoconstrictors like phenylephrine will reverse the action and can actually worsen the condition by producing vasodilatation.

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HDAC inhibitors: a Promising Class of Anticancer Agents

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Background : Histone deacetylases (HDACs) are a class of enzymes found in bacteria, fungi, plants and animals that remove the acetyl group from the epsilon amino groups of lysine residues located in the NH₂ terminal tails of core histones. There are 18 known human histone deacetylases,

grouped into four classes. HDAC inhibitors (HDACIs) are a family of naturally derived and synthetically produced compounds that target the classical HDAC enzymes. HDACIs are classified into groups, based on their chemical structure, including Hydroxamic acids (vorinostat), Carboxylic acids (valproate), Aminobenzamides (entinostat), Cyclic peptides (romidepsin), Epoxyketones (trapoxins) and Hybrid molecules.

Objective : Efficacy and specificity of HDAC Inhibitors

Materials and methods : MOA:- HDAC inhibitors exert multiple cellular effects and the mechanism of action includes cell cycle arrest, activation of apoptotic pathway, induction of autophagy, reactive oxygen species generation, and angiogenesis.

TOXICITY:- The most common adverse events observed with the use of HDAC inhibitors were thrombocytopenia, neutropenia, anemia, fatigue, diarrhea and cardiotoxicity (T-wave flattening, ST-segment depression and QT-interval prolongation).

Results : FUTURE PERSPECTIVES:- Besides the anticancer activities, the use of HDAC inhibitors in other diseases, such as intestinal fibrosis, Hodgkin lymphoma, diffuse large B-cell lymphoma, Huntington's disease, Friedreich's ataxia, Alzheimer's disease, Duchenne muscular dystrophies, depression, anxiety disorders, heart failure, myocardial ischemia, HIV/AIDS, parasitic diseases, metabolic disorders and many more, is also awaited.

Conclusion : HDAC inhibitors represent a promising class of anticancer agents. To date, only four HDAC inhibitors have been approved by the FDA viz; Vorinostat, Romidepsin, Belinostat for cutaneous T-cell lymphoma/peripheral T-cell lymphoma and Farydak in multiple myelomas.

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A Prospective Study of Antimicrobial Prophylaxis in Lower Segment Cesarean Section in a Tertiary Medical Center

NAVEEN POOJAR CM, JYOTHI. R

Background : Infectious morbidity remains a leading cause of postoperative complications following cesarean delivery. Prophylactic use of antibiotics has become an accepted practice to minimize the incidence of postoperative complications, but adherence to proper timing guidelines remains problematic. Judicious use of antibiotics in the hospital through effective antibiotic policy and guideline development is then essential.

Objective : "1. To evaluate the pattern of Antimicrobial prophylaxis in Lower segment cesarean section.

2. To assess the frequency of postoperative morbidity.

Material and Methods : It was a prospective observational study was conducted in the department of Obstetrics, Rajarajeswari Medical College and Hospital, Bangalore. A study was conducted over a period of one year on 250 patients based on 20% of prevalence rate of lower segment cesarean section. The patients who underwent lower segment cesarean section (elective and emergency) was observed from the period of 1st dose of antimicrobial prophylaxis till the patient is discharged. Relevant information on each patient was collected according to the proforma designed for the study. Antibiotics used, their dose dosage schedule were recorded. Investigations like pus, blood and urine culture and sensitivity was done for patients with postoperative complications. Change of antibiotic following culture sensitivity report was noted.

Results : In our study, most of the patients came from low socioeconomic status. We observed the use of third generation cephalosporins like ceftriaxone or cefotaxime and metronidazole and gentamycin in most of the patients. Two drug or three drug combinations were used which commonly included third generation cephalosporins and metronidazole with gentamicin being added in three drug combinations. Fifty six patients in cesarean section had post operative complications which included wound infection, UTI and fever. There was no post operative mortality in this study.

Conclusion : Use of prophylactic antibiotics in women undergoing cesarean section substantially reduced the incidence of episodes of fever, endometritis, wound infection, urinary tract infection and serious infection after cesarean section. Our study revealed that all the antibiotics used were broad spectrum and bactericidal. Hence, a proper guideline is required for optimum antibiotic prophylaxis in CS.

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P/ Ph/12

Analysis of Commonly Used Paediatric Systemic Antibacterial Oral Liquid Formulations for Rational Drug Therapy

**PAYAL NAIK, CHAITALI MEHTA,
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Background : Antibiotics are frequently prescribed medication. When drugs are dispensed in form of syrups or suspensions, appropriate volume should be dispensed in a bottle otherwise it may result into wastage of drug,

inadequate treatment and resistance and also increased cost of treatment.

Objective : The aim of our study was to analyze systemic antibacterial liquid formulations to ascertain the availability of adequate strength, volume dispensed for adequate treatment.

Materials and methods : The commonly available (CIMS and MIMS; April 2015) oral liquid antibacterial formulations were analyzed. According to the weight of child (for 12 & 18 kg) amount of drug and requirement of number of bottles for 5 days were calculated.

Results : Majority of manufacturers have dispensed inadequate volume of antibacterial drugs which was not sufficient for one course of therapy. For example, most of the formulations of amoxycillin, amoxycillin + clavulanic acid and cefuroxime were available in dispensing volume of 30 ml. This results into inadequate dose, wastage of drug (residual volume), resistance and unnecessary social and financial burden to the patient. Hence, more number of bottles shall be required to complete a course of antibiotic.

Conclusion : The dispensing volume of oral liquid dosage forms of most of the formulations were inadequate and thus, minimum amount dispensed should be 60 ml or as applicable for an antibiotic.

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P/ Ph/13

Evaluation of Anti- Depressant Effect of Vitamin C, At Different Doses, in Mice

SARITA GOYAL, M.C. GUPTA

Background : Vitamin C is a water-soluble antioxidant vitamin and has several therapeutic applications in curing a wide range of diseases. It is highly concentrated in the brain and considered as a neuromodulator and has a possible therapeutic relevance for the treatment of depression.

Objectives : The study was conducted to investigate the anti-depressant effect of vitamin c and the co-relation between the dose and antidepressant action.

Material and methods : Twenty four male mice were selected and divided into four groups (n=6). Group I received normal saline and served as control. Group II received venlafaxine (0.048mg/g) and served as standard Group III and Group IV received 0.065mg/g and 0.13 mg/g of Vit. C, respectively. Forced swimming test (FST) and tail suspension test (TST) were employed to produce depression in them. All animals received drug treatment intraperitoneally (i.p.), thirty minutes before the test.

Results : Vit. C, at a dose of 0.13mg/g, decreased immobility period and increased swimming as well as climbing, significantly, ($p < 0.01$) in both TST and FST as compared to normal saline treated group. The effect of Vit. C, at the dosage of 0.13mg/g, was comparable to that of venlafaxine while at the dose of 0.065mg/g showed no significant difference when compared to other groups.

Conclusion : Higher dosages of Vit. C are effective to produce an antidepressant effect.

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P/ Ph/14

Effect of Omega-3 Fatty Acids Vs 5-Hydroxytryptophan as Add on Therapy in Controlling Suicidal idea

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Background : Omega-3 fatty acids and 5-hydroxytryptophan have been gaining attention as a promising alternative treatment for depressive illness. The present study evaluates the role of these agents as add on treatment in patients with depression.

Objective : To evaluate efficacy of omega-3 fatty acids vs 5-hydroxytryptophan as add on therapy in controlling suicidal ideation in depressive patients on sertraline.

Materials and methods : This was a prospective, open label, randomized, parallel group study conducted in department of Psychiatry. Ninety treatment naive patients (18-65 years age) were enrolled and divided into 3 groups of 30 each. Group I: Sertraline, Group II: Sertraline plus omega-3 fatty acids, Group III: Sertraline plus 5-hydroxytryptophan. Suicidal ideation was assessed with Beck's scale for suicide (BSS) ideation at weeks 0, 4 and 8. Data were analyzed using multifactorial ANOVA (SPSS version 20.0).

Results : Baseline parameters in patients of all groups were comparable. Administration of sertraline resulted in reduction of Beck's scale for suicidal ideation scores as compared to baseline. Addition of omega-3 fatty acids and 5-hydroxytryptophan also showed reduction in Beck's scores. Effect of omega-3 fatty acid as add on therapy was more as compared to 5-hydroxytryptophan and sertraline alone, which was statistically significant (p value < 0.05).

Conclusion : Both omega-3 fatty acids and 5-hydroxytryptophan produce significant effect in controlling suicidal ideation in patients with depression.

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P/ Ph/15

Prenatal Exposure of Valproic Acid in Rats: Effects on Sleep Architecture

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Background : Exposure to valproic acid during prenatal period is known to produce autism-like features in their offspring. This includes deficit in communication, social interactions, stereotyped repetitive behaviour and also high risk factors for sleep disorders. Hence the present study has assessed the prevalence of sleep disturbances and possible neural correlates of sleep stages in a prenatally induced Valproic acid (VPA) rat model of autism.

Objectives : "1.Evaluation of autism like features in VPA exposed rats by using various behavioral phenotypic assays.

2.Study of sleep architecture through polysomnography recordings.

Material and methods : Valproic acid was injected at the dosage of 450mg per kg body weight on E12.5 day. Rat pups were weaned on P21 and they were grouped into 3-4 rats per cage. The behavioural phenotype for autism was assessed using social interaction test, light-dark test, prepulse inhibition test and Polysomnography to assess the sleep architecture.

Results : Rats at adolescent and young adulthood showed some features of autism when compared to vehicle treated rats. More predominantly, prenatally VPA exposed rats showed sleep disturbances associated with significant increase in REM sleep and reduced total wake period.

Conclusion : The study shows prenatally induced VPA rats have sleep disturbances with increased REM sleep duration.

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P/ Ph/16

Clinical Benefits of Autologous Growth Factors in Androgenic Alopecia

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Background : Autologous growth factors in Platelet-rich plasma (PRP) have become a better option for the treatment in various types of alopecia. Growth factors released from platelets may act on stem cells in the bulge area of the follicles, stimulating the development of new follicles and promoting neovascularisation.

Objectives : To demonstrate that autologous GFs in PRP, compounded with plasmatic protein concentrate, stimulate the activation of stem cells in miniaturized hair follicles, thus favoring the conversion of follicle stem cells to progenitor cells.

Material and methods : "Five participants are 18 years, who have not responded to any topical or systematic treatment for hair loss during last 6 months. A total volume of 2-3 ml Autologous growth factors in PRP was injected in the scalp by using an insulin syringe. Treatment repeated every two weeks, for total four times. The outcome assessed after 3 months by clinical examination, hair pull test, and patient's overall satisfaction.

Results : The diagnosis of Androgenic alopecia was based on clinical and trichoscopic features, while the extent and stage was evaluated according to the Hamilton-Norwood scale for men and Ludwig scale for women. Safety, efficacy and feasibility of PRP injections were assessed."

Conclusion : A significant reduction in hair loss observed between first and fourth injection. Implanting follicular units with PRP raised the hair yield rate, probably because of partial effects of GFs in PRP. This research provides support for clinical application of autologous growth factors in PRP and its secretory factors for promotion of hair growth.

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P/ Ph/17

Trimethoprim – Sulfamethoxazole : A rare cause of drug induced

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Background: Co-trimoxazole(TMP/SMX) is the drug of choice for treating Pneumocystis pneumonia in retroviral infections. Incidence of co-trimoxazole causing pancreatitis and kidney injury being extremely rare , adverse drug reaction (ADR) monitoring is warranted.

Objective : ADR of Co-trimoxazole in a newly diagnosed Human Immunodeficiency Virus (HIV) positive patient .

Materials and methods : As a part of pharmacovigilance program in KMC Manipal, a patient treated with TMP/SMX was observed. Relevant data was collected from case record as per Central Drug Standard Control Organization (CDSCO) form. Adverse drug reports were collected and causality assessment was done.

Results: Three adverse drug reports were observed with Co-trimoxazole in a patient with Pneumocystis pneumonia. Three tablets each containing 800mg sulfamethoxazole and

160 mg trimethoprim thrice daily along with intravenous injection once daily was given for 26 days and 6 days respectively. Rise in serum amylase /lipase suggesting acute pancreatitis and rise in urea, creatinine, electrolytes suggesting acute kidney injury was observed along with crystalluria. As a part of intervention the drug was stopped, antibiotics and IV fluids given. Kidney injury and crystalluria resolved, pancreatitis is still resolving. All ADRs were classified as probable according to Naranjo scale.

Conclusion : This case demonstrates a probable causal relationship between TMP/SMX and above mentioned adverse events .Hence, it is prudent enough to exercise caution when using Co-trimoxazole.

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P/OP/1

Evaluation of LPS Induced Uveitis Model for its Suitability to Study the Role of Drug Transporters in Eye

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Background : The blood ocular barrier (BOB) plays an important role in the maintenance of the homeostasis of eye. Thus the understanding about the altered BOB functions during ocular inflammatory conditions is expected to reveal strategies for the rational development of drugs for their enhanced penetration with adequate concentration across the blood retinal barriers.

Objective : This study was conducted to evaluate the possibility of using LPS induced uveitis in rats to evaluate the function of drug transporters affecting ocular kinetics of drugs during therapy.

Materials and methods : Wistar rats of either sex weighing 150-200g were used for this study. Lipopolysaccharide (E. coli endotoxin) was administered at the dose of 200mcg in 0.1ml saline into subcutaneous, intraperitoneal, intravenous routes and hind paw. Saline was injected into control animals. Aqueous humor was aspirated at 24 hrs and was subjected for the analysis of total protein concentration and leucocyte count. They were also subjected for anterior segment analysis using MICRON-3. In another experiment at different intervals aqueous humor was collected after LPS challenge into hind paw and subjected for analysis. At 22nd hour both control and the rats challenged with LPS, fluorescein sodium was injected at the dose 14mg/kg. Aqueous humor was collected at 24hrs for the quantitation of fluorescein using spectrofluorometer.

Results : This study showed LPS injected into hind paw showed the maximum protein concentration and cell infiltrates in aqueous humor at 24hrs post injection. Image analysis revealed miosis produced was comparable to pilocarpine induced miosis however with extensive vasodilatation. Fluorescein sodium showed 30 fold increase in aqueous humor after LPS challenge indicating enhanced paracellular transport in this model.

Conclusion : This study showed the suitability of LPS induced uveitis model to evaluate the function of drug transporters in blood aqueous barriers. Further studies are in progress to delineate the role of organic anion and cation transporters in this model.

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P/OP/2

Effect of Combined Therapy with Ennin Angiotensin Inhibitor and Angiotensin Receptor Blocker in Experimental Model of Retinopathy of Prematurity

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Background : Role of local ennin angiotensin system has been reported extensively in last two decades. Premature babies get affected at immediate and later stages of life due to interrupted development of vasculature or/and organ such retinal vessels and lungs respectively.

Objective : This study was carried out to understand the role of ennin angiotensin axis in pathological conditions induced by hypoxic insult.

Material and Methods : Retinopathy of prematurity (ROP) was induced in neonatal rat pups. On 12th postnatal day the pups were randomised into (n=9) viz. disease control (saline treated), combined therapy with telmisartan (angiotensin receptor blocker) and lisinopril (angiotensin converting enzyme inhibitor), bevacizumab (antibody against VEGF) treated and pups grew up in normoxia. Retina was evaluated for its structure, function along with gene expression of RAS components, VEGF and HIF 1 alpha in retina and lungs. Drug concentration was analysed using LC-MS/MS.

Results : Rat pups retina showed the reduction in tortuosity index, vessel density of the retinal vasculature and improved “b” wave response in the respective groups with therapeutic concentration of drugs in tissues. Interestingly the gene expression analysis in lungs and retina, VEGF,

HIF1 alpha and RAS levels were significantly reduced in the test groups when compared with disease control group.

Conclusion : Present study shows intervening the over activated RAS through combined therapy could able to minimize the adverse effect of hypoxic insult. Further studies are in progress to understand the RAS mechanisms involved in ROP.

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P/OP/3

Antihyperglycemic and Gene Expression Studies of a Polyherbal Formulation (Madhu Rodhak) in the Steroid Induced Hyperglycemia Model of Developing Chick Embryo

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Background : In the present study, a new Ayurvedic proprietary formulation Madhu Rodhak (MR) comprising of four plant materials with reported antihyperglycemic effect, has been investigated in animal models for its purported use in diabetes.

Material and Methods : Hyperglycemia was induced by hydrocortisone sodium succinate (HC) at a dose of 0.25 µmol/ 0.1 mL in the developing chick embryo. The effect of different doses of MR (50, 100, 200 and 400 µg) was studied on blood glucose level. Insulin was a positive control. Along with phytochemical analysis, anticataract and antioxidant properties, MR was also evaluated for gene expression studies for glucose transporters i.e. Glut 1, Glut 2 and Glut 3 in chick embryos in presence of HC.

Results : Results: MR at the concentration of 50, 100, 200 and 400 µg/embryo produced significant reduction in blood glucose level by 24.56%, 30.58%, 35.52% and 37.03% respectively. MR (100 µg, 200 µg and 400 µg) significantly upregulated Glut 1 expression and also delayed the progression of cataract formation with marked restoration of both lenticular and hepatic GSH. Phytochemical analysis showed high contents of flavonoids.

Conclusion : The study explored the anti-hyperglycemic activity of MR which is probably attributable to its rich flavonoid contents and capability to activate Glut-1 transporter thus improving the glucose uptake by peripheral tissues in chick embryo.

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P12. Medical Education

P/ ME/1

Perceptions of undergraduate students about Seminar Presentation as a means of understanding Hematology

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Background: MCI is at the brink of introducing a new curriculum in medical education in India based on competency of medical graduates. We are looking forward to better ways of producing more skilled doctors, as one cannot be a good physician without having a sound knowledge and understanding of physiological aspects of each system. This study experiments the modality of seminar presentation as a means of improving understanding of hematology in MBBS students, besides the traditional undergraduate teaching in a medical college in North-East India.

Objective: To study how MBBS students perceive presentation of seminar as a means of understanding Hematology

Material and Methods: A seminar in hematology was organized after a completed series of lectures. All 100 1st MBBS students were grouped into 10 with 2 facilitators each and allowed to present on a topic of their choice in hematology. Prizes were announced for the best presentations to encourage active participation. After the seminar, their responses to anonymous feedback Questionnaires were collected and analyzed.

Results: Feedback obtained revealed that majority of students perceived the seminars to be informative, creative, innovative and their understanding of physiology was improved. Almost all of them felt that it taught them to research independently and encouraged group-learning and social interactions. Many of them reported their communication skills improved and fears of public-speaking overcome. Interestingly it was noted that students with this exposure were more confident during their final oral examination.

Conclusion: Inclusion of such initiatives benefits not only students' understanding of physiology, but also help develop skills for their future careers.

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P/ ME/2

Does Microteaching Really Help in Improving the Teaching Skills of the Medical Students?

SURIYA PRAKASH MUTHUKRISHNAN,
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Background: Microteaching refers to a scaled-down teaching encounter designed to develop new teaching skills and to improve existing skills. Role of microteaching as a teacher training technique in today's technically advanced society where communication has become ubiquitous is unclear. There is paucity in the literature to prove the effectiveness of microteaching on the teaching skills of the medical residents.

Objective: The current study was designed to assess the effectiveness of microteaching technique on the teaching skills of the medical residents by objective and subjective methods.

Material and Methods: Ten medical residents in Department of Physiology, AIIMS, New Delhi participated in the study. Microteaching session was conducted with an aim to improve the teaching skills. The teaching skill of the participants was assessed objectively by the peers and a survey instrument was used for the subjective assessment. Sessions were videotaped and given to the participants for self assessment.

Results: Various components of teaching skills such as set induction and lesson planning, presentation, reinforcement, stimulus variation, proper use of audio-visual (A-V) aid, closure and completeness of communication were compared before and after training among the study group. These skills significantly improved after training among the study group.

Conclusion: Microteaching improved the teaching skills of the medical residents. Microteaching can be included in the academic curriculum for the medical residents to enhance their teaching skills before the real teaching encounter with the students.

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P/ ME/3

Relationship of Emotional intelligence with Depression, Stress & Anxiety Scale in fresh medical students

RASHMI MAHAUR, PREETI JAIN,
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Background : Stress is inevitable aspect of medical education and training. It is important to identify

prevalence of symptoms of certain mental health problems like depression, anxiety and stress among medical students at different intervals of medical education. Few studies have also indicated some relationship between mental health and emotional intelligence (EI) in healthcare disciplines. However, there is scarcity of Indian literature on this subject

Objective : The purpose of this study was to determine prevalence of symptoms of depression, stress and anxiety in fresh medical students and to correlate them with their emotional intelligence.

Material and Methods : Ninety-eight students (M= 63, F=35), who had just completed their first week of medical college, participated voluntarily in the cross-sectional study. Trait emotional intelligence questionnaire-short form (TEIQue-sf) was used to measure EI. DASS-21 comprising of questions for each subscale of depression, anxiety and stress was used to evaluate mental health.

Results : Mean \pm SD age was 18.1 ± 1.03 yrs. The mean \pm SD TEIQue-sf score was 134.11 ± 23.39 . Prevalence of symptoms of depression, anxiety & stress was found to be 55%, 78% & 38% respectively. Correlation analysis indicated a statistically significant (all $p < 0.01$) inverse relationship between TEIQue-sf and all subscales of DASS 21 i.e. depression ($r = -0.549$), anxiety ($r = -0.440$) and stress ($r = -0.561$)

Conclusion : A considerable proportion of fresh medical students showed symptoms of stress, anxiety and depression. Results further showed that the students with high EI were less depressed, anxious and stressed compared to students with low EI. Enhancing EI via workshop and training can help in managing stress as well as promoting well-being of medical students

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P/ ME/4

A Study of Item Writing Flaws in Multiple Choice Questions in Physiology for MBBS Students

R S SOOD, A SOOD

Background : An examination based on Multiple Choice Questions (MCQs) is an efficient method of formative and summative assessments during MBBS course. Advantages include ease of administration, avoidance of subjectivity and prompt optical reader aided scoring of the answers. As handwriting and clarity of presentation do not come into play, grading is based purely on the knowledge. However, MCQs having Item Writing Flaws (IWFs) lose their value as an assessment tool. Sensitization of faculty to the issue

goes a long way in maintaining a high standard, thus, utility of items.

Objective : Analyze the occurrence of IWFs, classify, find the probable cause and recommend means to avoid the same while writing MCQs.

Materials and methods : Five hundred fourteen MCQs framed by faculty, for formative assessment of I MBBS students in Physiology, were subjected to pre-validation. The IWFs noted were classified and analyzed.

Results : Fifty six percent MCQs were free from IWFs and 44% had one or more IWFs. Majority (85%) of the flawed MCQs had solitary flaw and only 14% had two flaws each. Only 1% had three or four flaws. The common IWFs include: options with repeated words; sub-optimal handling of language; other than a single key; stem not well deliberated and spelling mistakes.

Conclusion : About half of the IWFs will be avoided with judicious use of language and use of some imagination to avoid repetition of words in options. Being thorough with the content will avoid majority of the rest. Importance of sensitization of faculty to the issue cannot be over-emphasized.

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P/ ME/5

Assessment of the Perception Regarding Educational Ambiance among Undergraduate Medical Students at Geetanjali Medical College

SANDHYA SHARMA, MANJINDER KAUR, NAREN KURMI, M.L SUHALKA

Background : The academic quality of any medical institution is reflected by its educational environment. Therefore, various factors like teaching, learning, co-curricular activities, residential premises, self and social perceptions play a vital role in holistic medical educational environment.

Objectives : To evaluate the student's perception regarding educational environment of our institution.

Material and methods : This was a questionnaire based cross sectional study. The Dundee Ready Educational Environment Measure (DREEM) questionnaire was administered to medical students studying in the pre-clinical years at the Geetanjali Medical College in India. Finally the feedback was analyzed by using SPSS 16.0 version.

Results : Total one ninety four respondents who were all present on the date of classes to the college and who were willing to participate in the study were included. Out of 194

respondents 2nd semester were 130 and 4th semester were 64. Item as well as scores was compared. There was significant difference (P value = 0.008) in the score of 2nd and 4th Semester students.

Conclusion : Study has revealed that perception levels of 2nd semester were significantly better, as compared to students of 4th semester.

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P/ ME/6

MCQ Supplementation in a didactic class: A learning tool

MADHU BHATT

Background : Teachers can no more be complacent with having managed to finish with a lecture or the assigned syllabus. Their teaching is being judged and monitored by learner outcomes. Medical educators are being challenged to develop innovative creative material and methods so as to engage the students in active learning, more so for basic sciences. In addition the innovations should be designed keeping time, manpower and economy constraints in mind.

Objective : Overall objective of this study was to study and assess the role of MCQ supplementation in a didactic class in improving student learning.

Materials and methods : 136 First year MBBS students of a government medical college attending physiology classes were recruited for the study. Based on the university recognized syllabus (must now area) the Specific learning objectives (SLOs) were randomly grouped into two categories ; SLOs for which didactic classes were to be supplemented with multiple choice questions (MCQs) and those SLOs for which didactic classes were to be taught without MCQ supplementation. The handouts of the MCQs without the answer key were handed out to students 2-3 days in advance.

Results : Scores obtained in a formative test consisting of 20 MCQs (10 from topics reinforced with MCQs and 10 from topics without reinforcement with MCQs) of 1 mark each were analysed (maximum score = 10 in each category) by student's unpaired t test . Mean scores when subjected to unpaired t test did not show statistically significant difference $p = 0.657$; $t = 0.452$. But the individual scores in the two categories of MCQs showed a statistically significant difference ; $p = 0.025$; $t = 2.259$; 95% CI.

Conclusion : Reinforcement of Didactic class with MCQ supplementation is an effective learning tool which was well received by the participants.

P/ ME/7

Usefulness of Animal simulator software in teaching Amphibian Physiology practical for 1st Prof MBBS students

SANHITA MUKHERJEE

Background & Objectives: Amphibian experiments in Physiology Practical classes are at present taught by using simple lecture-demonstrations as killing of animals for laboratory use has become controversial especially after the intervention of animal rights activists. Animal Simulation method could be used as an alternative to it. The present study tried to see the knowledge gained by the 1st Prof MBBS students by using Animal Simulation model in Amphibian Physiology Practical classes as compared to conventional Lecture-Demonstration method. It also tried to find out that the difference in knowledge gain by Poor performing students as compared to Good Performers. The student's Perception on this simulation based T-L Methodology was also surveyed.

Material & Methods : This interventional study was done in the department of Physiology, B. S. Medical College, Bankura, after obtaining proper written approval from the institutional ethics committee. Pre-test was conducted by a validated Questionnaire consisting 25 MCQs. Then the class of 150 1st Year medical students was divided into two groups of 75 students each by Systematic Random Sampling. Group 1 or Case attended Animal Simulation ((Reed Elsevier India Pvt. Ltd, product@animalsimulator.com) Method while other batch of students (Group 2, Control) attended Lecture-demonstration. After 15 days both the groups were tested with the same questionnaire (Post Test). Pre-Test & Post-Test scores were analyzed using SPSS statistical software. Group 1 student's perception to the simulation based teaching was surveyed by a questionnaire. Cross over was done after completion of the study.

Result : The new method of Simulation based teaching of nerve-muscle Physiology of 1st Prof MBBS students was found more effective than the Traditional Lecture-Demonstration method. This new method is particularly helpful for slow learners. Students also found it interesting, student centric and useful.

Conclusion : Simulation based teaching of Amphibian Physiology is a better method that needs to be implemented on a wider scale in 1st Prof MBBS Physiology curriculum.

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P13. Miscellaneous

P/ Mis/1

Internet addiction: exploring its effects on medical students

MEGHA AGRAWAL, SOWMYA RAJARAM

Background : Internet usage has become an integral part of modern lifestyle. Not many studies on Internet addiction have been done in India.

Objective

This study aims to explore:

Internet addiction in first year medical students

To assess which aspects of cognition and sleep are affected by it.

Material and Methods : A total of 100 students of BMCRI, aged 17-20 years were administered 2 questionnaires – Davis online cognition scale (DOCS) and Pittsburg Sleep Quality Index Questionnaire (PSQI) to assess Internet addiction and sleep respectively.

Results : Internet addiction was found in 71 students with slight predilection in males (41 out of 55 males, 74.54%) than females (30 out of 45 females, 66.67%). The number of students with poor sleep quality was 16. Based on the PSQI scores, the components affected most were daytime dysfunction, sleep disturbance and sleep latency. The DOCS scores were divided into four quartiles with 4th quartile indicating the worst score. The cognitive parameters affected the most were distraction, loneliness/ depression, and impulsivity. Most addicted students didn't show problematic social comfort. However, no association between Internet addiction and sleep was observed.

Conclusion : In our study, we observed that most medical students showed problematic Internet usage with higher occurrence of distraction, impulsivity and negative emotions like depression and loneliness. This indicates that Internet addiction has psychosocial implications that need to be further explored and addressed in the future.

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P/ Mis /2

Clinical characteristics of a severe headache and its impact on personal life of patients

RESHU GUPTA, NEHA SABOO, JITENDRA AHUJA

Background: Headache and its consequent suffering may bring about limitation in daily activities and work and patients' job performance leading to an economic burden on society.

Objectives : To find out characteristics of a severe headache and its impact on personal life of patients.

Methodology: The present study was a cross sectional hospital based study conducted in association of Neurology, Medicine and Physiology department of MGMCH, Jaipur. After obtaining ethical clearance of the protocol, data from 100 patients attending the OPD of Neurology and Medicine department of MG hospital, complaining of headache due to any cause were used to obtain demographic and clinical variables. A detailed history was followed by a complete physical examination. They were asked to complete a structured questionnaire to obtain the headache characteristics. All analyses were stratified by age and gender. Final diagnoses were made as per International Headache Society criteria.

Results: Common Migraine (28.99%) and Vascular headache (28.99%) constituted majority of cases of the primary headache; tension headache only 6%. The mean age of the study population was 32.66±14.63 years. Average age of onset was 26.05±5.32 years. Primary Headache was found to be more common among married patients (82%) as compared to singles with females outnumbering males. Males were more likely to be fatigued and miss work. Mood changes and appetite loss were more common in females.

Conclusion: There are significant number of serious headache sufferers in Rajasthan who experience social as well as personal impairment as a result of their illness. Further research is recommended to evaluate the extent of interpersonal and personal disability due to this disorder.

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Correlation of Serum Magnesium Level with Cardiometabolic Syndrome

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VANI GUPTA, KALPANA SINGH, SHRADDHA
SINGH, SUNITA TIWARI

Background : Magnesium is second most abundant (after potassium) intracellular cation and is forth most abundant cation of human body. Magnesium is cofactor for approximately 300 enzymes involved in metabolic pathway and plays important role in intracellular signalling. Cardiometabolic syndrome or metabolic syndrome according to NCEP ATP III, 2001 comprised of three or more of the following: central obesity: waist circumference >102 cm in men, >88 cm in women, triglycerides ≥ 150 mg/dl, low HDL-C: 40 mg/dl) for men, 50 mg/dl for women, blood pressure 130/85 mm Hg, fasting plasma glucose >100 mg/dl or on medication for above mentioned problems. Magnesium is emerging as one of the causative factor for cardiometabolic syndrome.

Objective : The purpose of this study is to find out correlation between serum magnesium and cardiometabolic risk factors like fasting blood sugar, insulin resistance, lipid profile, CRP, obesity and hypertension in apparently healthy individuals

Materials and methods : The cross-sectional study was performed in 130 apparently healthy individuals of 25-65 years of age from KGMU, Lucknow. 12 hour overnight fasting samples were taken for serum magnesium level, blood glucose and serum insulin level, lipid profile and CRP. Blood pressure was recorded and anthropometric assessment was done in all subjects.

Results : Significant negative correlation of fasting serum magnesium level was found with fasting blood glucose, insulin and HOMA-IR ($p < 0.0001^*$), triglyceride, VLDL and anthropometric parameters (Wt and WC).

Conclusion : By this study we can conclude that hypomagnesemia is correlated with several cardiometabolic risk factors. It can also be proved to be one of the predictor of cardiometabolic syndrome

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Effect of Listening to Vedic Chants and Indian Classical Instrumental Music on Patients Undergoing Upper Gastrointestinal Endoscopy

NEETU SHARMA, ANITA PADAM,
RAJESH SHARMA, SHIVANI MAHAJAN

Background: It has been proven that patients undergoing any invasive procedure are generally anxious and worried

Objective: To analyze the effect of listening to Vedic chants and Indian classical Instrumental music on anxiety levels of patients undergoing upper gastrointestinal endoscopy.

Material and Methods: Prospective, Randomized controlled trial was done on 199 patients undergoing upper gastrointestinal endoscopy. On arrival their anxiety levels were assessed using State and Trait scores and various physiological parameters like HR, BP. Patients were randomly divided into three groups, Group-I of 66 patients who were made to listen pre-recorded Vedic chants for 10 minutes and Group-II, 65 patients who listened to Indian classical instrumental music for 10 minutes. Group-III of 65 controls remained seated for same time period in the same environment. Their anxiety State scores and physiological parameters were reassessed.

Results: Anxiety State scores reduced significantly in Group-I, (from 40.4 ± 8.9 to 38.5 ± 10.7 ; $p < 0.05$) and in Group-II highly significant decrease was observed. (from 41.8 ± 9.9 to 38.0 ± 8.6 ; $p < 0.001$) as compared to Group-III which showed no change in anxiety scores. Significant decrease in systolic BP ($p < 0.001$), diastolic BP ($p < 0.05$) was also observed in Group-II :

Conclusion: Listening to Vedic chants and Indian classical Instrumental music has beneficial effects on alleviating anxiety levels induced by apprehension of invasive procedures and can be of therapeutic use

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P/ Mis /5

Neck Circumference: A screening tool to Assess Obesity in First Year Medical Undergraduates.

VEENA THAMBAN, KAVANA GV, SPARSHADEEP EM, BANDELKAR MG.

Background : Neck circumference measurement is one of the simple screening measurements which can be used as an index of obesity.

Objective : To correlate the neck circumference with body mass index and waist circumference.

Materials and methods : Ethical approval has been obtained from Institutional Ethical Committee. The study comprised 100 medical students, aged 18-20 years. Anthropometric markers of obesity were measured, including body mass index (BMI), waist circumference (WC), hip circumference (HC), waist-to-hip ratio (W-H ratio) and compared with neck circumference (NC) of the same subjects.

Results : The mean BMI (kg/m^2) and WC (cm) were 22.38 ± 3.94 & 74.88 ± 6.28 in boys and 21.17 ± 3.39 & 77.13 ± 7.73 in girls respectively. Mean NC (cm) in boys and girls were 31.37 ± 1.88 and 31.61 ± 1.88 respectively. There was no significant difference between genders for BMI, WC and NC.

At BMI of 25 kg/m^2 (overweight) and 30 kg/m^2 (obesity), boys had NC of 34cm & 35cm and WC of 81cm & 86cm compared to girls who had NC of 33cm & 34cm and WC of 84 & 94cm respectively.

NC had a positive correlation with WC ($r=0.67$; $p=0.000$) and BMI ($r=0.4$, $p=0.03$) in boys as well as in girls (WC: $r=0.60$, $p=0.000$, BMI: $r=0.73$, $p=0.000$).

Conclusion : Neck circumference correlated positively with BMI and WC. A NC of ≥ 34 cm in boys and ≥ 33 cm in girls can be considered the cutoff point for overweight/obesity. The study concludes that NC is a potentially useful initial screening tool for overweight/obesity.

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P/ Mis /6

Awareness about blood donation among medical students in Manipur

SUNETRA SARMA, L. SURESH ROY

Background : Awareness about blood donation especially among medical students is need of the hour, as blood is priceless and useful in many therapeutic and preventive

aspects of medical treatment. Increase in the awareness level about blood donation will lead to its acceptance by the society which will be beneficial to all.

Objectives : To determine the awareness level about blood donation among medical students in RIMS, Imphal

Material and Methods : A survey was conducted among 69 first year MBBS students admitted in Regional Institute of Medical Sciences, Imphal in the month of September, 2015 with the help of a preformed and pretested questionnaire which contained 25 questions.

Results : The study showed that most of them (92%) out of 69 students had never donated blood so far. Majority (76%) of them received the information about blood donation from social media like internet etc, while only 14% got from books. Majority (97%) of them were aware about screening of blood and spread of HIV/AIDS and Hepatitis B through blood donation. But a large proportion (40%) of them did not know about spread of malaria through it. Most of them (79%) did not know about professional blood donors and its ban in India. Majority (57%) of them were aware of World Blood Donor's Day. 42% of them knew that donated blood can be used for 3 months. Most of them (65%) suggested that there is need for conduct of awareness programmes, so that the misconceptions about blood donation are removed.

Conclusion : The above study shows that the awareness level about blood donation among students are quite high inspite of lower rate of its acceptance. So, the student communities can be motivated and encouraged to donate blood through conduct of proper awareness programmers in the school and college levels.

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P/ Mis /7

Elevated blood lead levels and cytogenetic markers in buccal epithelial cells of painters in India

SHILPA, AHMAD I, MAHDI AA, AKHTAR MJ, ISLAM N, ASHQIN M, VENKATESH T.

Background : Lead, a major contaminant, is highly used in paint manufacturing due to its anticorrosive properties. Recent reports indicated high lead content among Indian paints used for commercial purposes. Painters are continuously exposed to these lead containing paints during painting of both commercial as well as residential buildings. Lead is well-known for its genotoxicity in occupational workers.

Objectives : The aim of this study was to know the genotoxic end points in painters due to their long-term exposure to these high lead-containing Indian paints.

Material and Methods : Study group selection was made after a questionnaire administration, which included questions about lifestyle and medical history to exclude exposure to the other potential sources of genotoxics. Blood and buccal cell samples were obtained from 30 male painters and from a similar number of age-matched controls of same location with no occupational exposure to lead. Blood lead levels (Pb-B) were measured in painters and controls. Micronucleus (MN) frequencies and nuclear changes, i.e., karyorrhexis, karyolysis, broken egg, and binucleated, were investigated in buccal epithelial cells.

Results : Painters had significantly ($P < 0.01$) greater lead levels in blood than the control group. MN frequencies and nuclear changes in buccal epithelial cells were also significantly ($P < 0.01$) elevated in painters as compared with control subjects. Regression analysis also revealed significant ($P < 0.01$) association of Pb-B with all the genotoxic endpoints in painters. Cytogenetic damage was significantly associated with Pb-B as no other co-founding factors (smoking, alcohols) showed significant difference between both groups

Conclusion : Frequent, high and unregulated use of lead in paints may cause genetic mutation and may accelerate cytogenetic damage which may further lead to different carcinomas in painters. These findings need to be considered and necessary steps should be taken to protect the occupational workers engaged with these high lead-containing paints.

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P/ Mis /8

Effect of Gasoline Inhalation on the Liver Enzymes among the Petrol Pump Workers of Jaipur City

**RAHUL, SANGEETA VYAS, NIVEDITA GUPTA,
POONAM PUNJABI, MANISHA SANKHLA**

Background : Occupational exposure and its health outcomes need to be addressed as a matter of great concern with rapid urbanization. In this context, petrol pump workers were studied who by virtue of their occupation are continuously exposed to various aliphatic and aromatic compounds present in the gasoline. These gasoline constituents are known to affect various physiological processes of human body yet the existing information is sparse regarding the effects of gasoline inhalation on liver functions among the fuel filling attendants working in Indian settings.

Objective : To assess and compare the liver enzymes (SGPT, SGOT, Serum Alkaline Phosphatase) among the petrol pump workers and matched healthy controls.

Material and Methods : Forty non-smokers, non-alcoholic petrol pump workers working for more than 5 years were considered as study group. Forty matched healthy adult males from the institute served as controls. Liver enzymes were assessed using fully automated analyzer (Beckman Coulter AU680). Mean \pm SD values for each parameter was determined for both the study and control groups and compared using unpaired t-test.

Results : A statistically significant increase in the liver enzymes (SGPT and SGOT) was observed in the Petrol pump workers as compared to the controls. However, Serum Alkaline Phosphatase did not show any statistically significant difference.

Conclusion : This study concludes that the fuel dispensers are at greater risk of developing hepatocellular damage with time as they are continuously exposed to the petroleum hydrocarbons which get metabolized in the liver into free radicals and active metabolites producing liver cell damage. Therefore, periodic health-checkups, use of protective devices are highly recommended.

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P/ Mis /9

Distribution of Intravenously Injected ^{51}Cr (III) in Rabbits

PRATHAP M BABY, PRAMOD KUMAR , RAJESH KUMAR , DINESH RAWAT, SANU SUSAN JACOB

Background : Trivalent chromium [^{51}Cr (III)] is a known biological tracer and has been used to tag plasma proteins, platelets and also to estimate blood volume. Nevertheless, there exists little or no knowledge on the clearance of ^{51}Cr (III) from blood and its bio-distribution, after its intravenous administration.

Objectives

1. Understand the clearance rate of ^{51}Cr (III) from blood
2. Determine the bio distribution of ^{51}Cr (III)

Materials and methods : Six adult New Zealand white albino rabbits (3 males and 3 females) were injected with ^{51}Cr (III) through marginal vein. Percentage clearance of ^{51}Cr (III) from blood was calculated by noting radioactive counts obtained at various time intervals at 1st, 58th, 61st, 120th, 180th and 240th minutes. For bio-distribution studies, organs were removed and weighed. Organs and urine were counted in a nucleonix gamma ray spectrometer having NaI scintillation detector and data expressed as cps/gm of tissue.

Results : Average clearance of ^{51}Cr (III) was 34% from 1st to 58th minute. Subsequent measurements for hourly clearance at 120, 180 & 240 minute showed percentage

reduction of radioactivity of 33, 14 & 8 respectively. Minimal specific activities were found in muscle and brain. Spleen, lungs, liver and kidneys showed moderate activity. Urine tracer concentrations were found to be more than ten times that of plasma.

Conclusion : Clearance of ^{51}Cr (III) from blood was faster initially, slowing progressively. Bio-distribution studies showed large amount of ^{51}Cr (III) excreted in urine. Moderate uptake of ^{51}Cr (III) by certain organs were observed, especially reticuloendothelial system.

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P/ Mis /10

Effect of Tobacco Exposure on the Autonomic Nervous Systems: A Field Study in Western India

PRACHI PRIYA

Background : Smoking is one of the leading causes of preventable morbidity and mortality, and affects the cardiovascular system by several mechanisms.

Objectives : This study aimed to establish the effects of tobacco exposure on the autonomic nervous system in smokers in Gujarat region.

Materials and methods : 200 male subjects in the age group of 20 to 50 years were selected for the present study, including 100 smokers and 100 non-smokers. Smokers were classified as per exposure level, on the basis of smoking index criteria. All the autonomic function tests under the scope of this study have been carried out at the Department of Physiology at Government Medical College, Bhavnagar.

Results : Results obtained were statistically evaluated using ANOVA and unpaired t-test analysis. Smokers in the age group of 20-50 years were found to exhibit significant alterations (i.e. $p < 0.01$) in autonomic functions as compared to non-smokers. Resting heart rate was found to be higher in the smokers whereas significant reduction in the value of 30:15 ratio, Expiration - Inspiration difference and Valsalva ratio were found in smokers as compared to non-smokers.

Conclusion : In the present study therefore, significant changes were observed in the parasympathetic and to some extent, in the sympathetic autonomic function tests in the smokers. Reliable and non-invasive autonomous function tests can help in detecting early involvement of the autonomic nervous system in smokers before the clinically related symptoms appear and thus helping in taking steps to prevent the further progress of the disease.

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P/ Mis /11

Fetal well-being Prediction Using Simulation of Markov Based Mathematical Model

ABDULLAH BIN QUEYAM, SHARVAN KUMAR PAHUJA, DILBAG SINGH

Background : Multiple factors contribute to the intra-uterine environment and fetal development. One such critical factor is Placental Blood Flow (PBF) because the quantity of oxygen delivered to the placenta and to the fetus is directly limited by PBF rate.

Objectives : Since the measurement of the hemodynamic quantities such as blood pressure and flow is not possible in utero hence a use of mathematical ptimizi is beneficial for the assessment of fetal well-being.

Material and methods : A markov model based mathematical model of fetal circulation is developed by taking three node concept. Placenta, Fetal Liver and Fetal Heart and rest of the fetal body represents the 3 nodes of markov model. A LabVIEW based software simulation of the model is performed to identify the degree of circulatory compromise in fetuses that leads to FGR fetuses.

Results : The model is simulated at various degree of Conductivity of the umbilical cord to the oxygenated blood. Model prediction indicate significant changes in the circulation of FGR fetuses compared to normal fetus.

Conclusion : Currently there is no single test that indicates the degree of fetal oxygenation or fetal well-being. The decision regarding the time of delivery in FGR fetuses is therefore based on a relative simple analysis of Doppler FVW's combined with functional testing such as biophysical profile and fetal heart rate. Therefore patient specific ptimizi may be useful in ptimizi ng and ptimizi ng the treatment option in pregnancies complicated by FGR.

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P/ Mis /12

Comparative Study of Fat Mass Index and Fat Free Mass Index on Blood Pressure of Young Medical Students

NARENDRA TIWARI

Background : there are so many studies associating blood pressure and body mass index in older age and some in young age but very few about correlation of fat body mass index and fat free mass index with blood pressure in young

age. Our purpose was to do comparative study of fat body mass index and fat free body mass index with blood pressure in young medical students.

Objectives :

1. Find correlation between blood pressure and fat mass index.
2. find correlation between blood pressure and fat free mass index.

Methods : 250 medical students of undergraduate of 17 to 25 years were chosen for this study. Body fat percentage and blood pressure were measured by OMRON HBF body fat monitor and then body fat mass and fat free mass was calculated, on the basis of which various indices were calculated. Association of fat mass index and fat free mass index was computed using chi square test and P value.

Result : it has been observed that blood pressure has more positive association with fat mass index in males while in female no significant difference observed.

Conclusion : fat mass index has strong correlation with blood pressure in males as compare to females. So after finding increased systolic blood pressure, our concerned was advise to reduce body fat and prevent to develop hypertension.

P/ Mis /13

Study on the Prevalence of Diabetes Mellitus in Schizophrenia – A True Association or Drug Effect?

MINAKSHI MITRA

Background : Diabetes and Schizophrenia have been linked since the beginning of 20th century. However in recent years the exuberant number of such publications have alarmed clinicians regarding this co incidence and hence our efforts in this study to vindicate the findings, determine the position and to suggest actions.

Objective : To study the effect of schizophrenia on induction of diabetes mellitus

Material and Methods : 52 newly diagnosed patients of schizophrenia of all age groups were tested for diabetes mellitus. The tests are FBS, PPBS and glycosylated HbA1c. 64 patients of established schizophrenia (duration >5 years) were also tested for the above.

Results : Results show that out of 52 newly diagnosed cases of schizophrenia only four are diabetic, whereas out

of 64 cases of chronic schizophrenia, 24 were found to be diabetic.

Conclusion : Despite previous literature our studies show that DM is not inborn with schizophrenia but comes later due to drugs or changed life style of schizophrenics.

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P/ Mis /14

Evaluation of Biochemical Variation in Serum and Saliva of Oral Cancer Patients

SAYEEDA MUSSAVIRA

Background : Oral cancer is one of the predominant forms of cancers worldwide and the Indian subcontinent. Saliva being an easily accessible non-invasive tumor vicinity fluid, tumor specific biochemical variations in this medium may be a promising supporting indicator for diagnosis / prognosis and management of this condition.

Objectives : This study aims at understanding tumor associated biochemical variations in the tumor vicinity fluid and serum of oral cancer patients.

Materials and methods : Samples for this study have been procured from the Department of Surgical Oncology, St. John's Academy of Health Sciences after an Institutional Ethics Committee approval. Blood (venepuncture) and saliva (expectoration) were collected from oral cancer cases (n=10) after obtaining an informed written consent. Serum (Se) and salivary (Sa) levels of Sialic acid (Ehrlich's method), amylase (Kinetic method), total antioxidant activity (Koracevic method), lipid peroxidation (FOX method) and uric acid (Uricase method) were assayed. Statistical analysis was carried out using Graphpad Prism6.

Results : Mean \pm SEM values of sialic acid (Sa- 90.51 \pm 39.39 mg/dl; Se- 122.6 \pm 33.69 mg/dl), amylase (Sa- 77408 \pm 63112 IU/L; Se- 25.93 \pm 5.288 IU/L), total antioxidant activity (Sa- 7.561 \pm 6.495 mmol/dl; Se- 1.796 \pm .2602 mmol/lt), lipid peroxidation (Sa-12.36 \pm 1.268; Se-17.94 \pm 8.88) and uric acid (Sa-3.543 \pm 0.4973 mg/dl; Se- 5.486 \pm 1.409 mg/dl) were observed. The proportionality of these variations between saliva and serum was also investigated.

Conclusion : With larger sample size more definitive comprehension of these variations may be possible. This may further substantiate the suitability of saliva in the management of oral cancer.

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Knowledge, Attitude and Practice of Prescribing Antioxidants in Patients with Hypertension amongst Practicing Physicians in Solapur

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Background: Hypertension (HT) is a major health problem worldwide. By altering the balance in the endothelium between vasoconstrictors such as thromboxane and vasodilators such as nitric oxide, reactive oxygen species contribute to endothelium-dependent vasoconstriction and increased vascular resistance which is an important contributor to the pathogenesis of hypertension. Supplementation with antioxidants, including vitamin C, E, or B6, thiols such as lipoic acid and cysteine, and the quinone enzyme Q10, have been shown to lower blood pressure in animal models and humans with essential hypertension.

Objectives: 1) To assess knowledge and attitude of practicing physicians regarding use of antioxidants in patients with hypertension.

2) To assess prescribing practices of antioxidants amongst these physicians

Material and Methods : It is a cross-sectional questionnaire based study conducted amongst general practitioners, physicians, cardiologists and diabetologists in Solapur from 1st October, 2015 to 30th October, 2015. A total of 30 doctors were interviewed using a predesigned questionnaire.

Results : Out of 30 doctors questioned, 24 (80%) doctors were aware of the role of oxidative stress in hypertension and out of those 24 doctors, 18 (75%) believed in prescribing antioxidants and its positive results on blood pressure. Only 10 (33.33%) doctors were actually prescribing antioxidants.

Conclusion : At present, antioxidant vitamins are the feasible treatments for oxidative stress in humans and should be used more frequently by doctors. It is crucial that we consider the implications of trial design and execution, and further investigation of cellular pro-and antioxidant mechanisms is critical.

A Study of Magnesium supplementation on Amplitude of Visual Evoked Potential in Patients of Diabetes Mellitus type-2 with Neuropathy

YOGENDRA RAJ SINGH, ASHUTOSH BHARDWAJ

Background: Neuropathy is the most common complication of diabetes patients. Oral magnesium supplementation improves both insulin sensitivity and metabolic control in type 2 diabetic subjects.

Objective: To evaluate the effect of magnesium supplementation on Visual Evoked Potential.

Materials and methods: Total 120 cases of diabetic neuropathic patients were selected from outdoor of neurology division of S.N.M.C Agra and they were examined and investigated for serum magnesium, fasting blood glucose and amplitude of Visual Evoked Potential before and after treatment at 4, 8, and 16 weeks. They were subdivided into two groups, Group-I(Case,n=60):Patient of diabetic neuropathy receiving magnesium supplementation (300mg/day)+Metformin(750mgBD)+Gabapentin(400mgTDS) therapy and Group-II(Control,n=60):Patient of Diabetic Neuropathy receiving only Metformin(750mgBD) + Gabapentin(400mgTDS).

Results:In right eye Mean value for amplitude in V.E.P in group-I before Magnesium supplementation and treatment was $5.07 \pm 0.219 \mu\text{V}$ as compared to $6.45 \pm 0.207 \mu\text{V}$ after supplementation and treatment which was considered significant ($p < 0.05$). In group-II before treatment mean value for amplitude in V.E.P of right eye was $4.43 \pm 0.25 \mu\text{V}$ as compared to $4.32 \pm 0.25 \mu\text{V}$ after treatment which was statistically insignificant ($p > 0.05$). In left eye, mean value for amplitude in V.E.P in group-I before Mg supplementation and treatment was $4.92 \pm 0.23 \mu\text{V}$ as compared to $6.32 \pm 0.21 \mu\text{V}$ after Mg supplementation and treatment which was considered significant ($p < 0.05$). In group-II before treatment mean value for amplitude in V.E.P of left eye was $4.53 \pm 0.23 \mu\text{V}$ as compared to $4.42 \pm 0.23 \mu\text{V}$ after treatment which was considered statistically insignificant ($p > 0.05$).

Conclusion: Results of the study suggest that Mg supplementation influence favourably the natural evolution of neuropathy.

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Mitochondrial Retrograde Signaling-Induced Epigenetic Modifications Perturbs Germ-Line Genomic Integrity in Testicular Milieu

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An altered redox state might affect epigenetic behaviour and genomic integrity in the testicular milieu, where stability is the key factor. Any drift in stochastic niche of the germ cells could potentially affect their epigenetic plasticity. The recipe for this could be a combination of exogenous cues regulating mitochondrial-nuclear-crosstalk. We aimed to delineate the mitochondrial retrograde signaling-induced aberrant chromatin responses in mouse spermatogonial epithelial cells. The pro-oxidant stress resulted in significant generation of superoxide radicals with marked inhibition of mitochondrial respiratory chain enzyme complexes II/III/IV and occurrence of mitophagy. The decrease in mtDNA/nDNA ratio paralleled an accumulation of 8-oxo-dG in mtDNA, decline in antioxidant enzyme activities and depolarisation of mitochondrial membrane potential, suggesting

functional derailment of mitochondrial machinery. Altered expression of cell cycle regulatory proteins, p21 and Cyclin D1 with up regulated p16 expression indicated a redox-dependent deregulation of cell cycle. This subsequently led to disturbance in epigenetic marks including post-translational histone modifications in the form of hypermethylated H3K9me1 and H4K20me3, hyperphosphorylated H3, hypoacetylated AcH3 and hyperubiquitinated uH2A residues. Dense heterochromatin foci and aberrant expression of HP1 α in nuclei of treated cells implied inception of senescence. Nuclear accumulation of NF- κ B prompted onset of senescence associated secretory phenotype that rendered the microenvironment favorable for oncogenesis. Interestingly, spontaneous emergence of daughter clones from the senescent mother phenotypes was noted. Neoplastic nature of these clones was confirmed by genomic instability, aberrant miRNA pattern and anchorage independent growth on soft agar colonies. Taken together, our study provides a unique dimension of oxygen radical injury in spermatogonia that might play an inextricable role in genomic and epigenomic imbalance in the testicular milieu. We envisage that detailed transcriptomic profiling of the genetically altered daughter clones might help to discern novel molecular switches that regulate this unknown molecular paradigm.

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