Results : In the present study we observed a cohort of genes displayed differential expression in epithelial and stromal cells in the function of different dosages of recombinant rh-bCG treatment.

Conclusion : human chorionic gonadotropin can modulate the uterine receptivity during widow of implantation.

Abs.CM.05

Probiotic Effect on Endotoxin Induced Portal Hypertension

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Objective : To investigate the efficacy of Probiotic (VSL#3) on Portal Hemodynamics and the Probiotic-induced TLR4 modulation and cytokine response in a previously described rabbit model of Endotoxemia induced portal hypertension (EIPHT).

Method : Sixty one rabbits (1.5–2 Kg) were divided into 3 groups of sham and experimental – EIPHT, EIPHT + VSL#3 and EIPHT+norflox. To induce PHT, Lipopolysaccharide (LPS) were injected through an indwelling cannula into the gastrosplenic vein. Endotoxin receptor molecule TLR4/CD14/MD2 and proinflammatory cytokines mRNA expression were detected by RealTime-PCR.

Results : Mean portal pressure in the EIPHT experimental group was significantly higher as compared to sham group at 1 month (16.9±1.37 vs 9.6±1.096 mmHg, $P<0.05$) and 6 month (18.38±1.05 vs 9.79±2.33 mm Hg, $P<0.05$). There was a significant ($P<0.05$) reduction in mean portal pressure of EIPHT+VSL#3 group (12.04±1.16 vs. 9.18±1.20 mmHg) as compared to EIPHT group (16.9±1.37 vs. 9.6±1.096 mmHg) at 1 month and same pattern in 6 month. Similarly, the mean PHT in EIPHT+norflox was significantly reduced as compared to EIPHT group. Expressions of TLR4 (0.605±0.41 vs 0.041±0.04) and CD14 (1.148±0.55 vs. 0.004±.003) in EIPHT experimental was higher than sham group ($P<0.05$). Significantly ($P<0.05$) low expressions of TLR4 (0.002±.003 vs. 0.816±0.122) and CD14 (0.030±0.04 vs. 0.097±0.03) in EIPHT+VSL#3 were seen as compared to EIPHT. But expressions of TLR4 and CD14 in EIPHT+norflox group were not significant. In EIPHT+VSL#3 the expressions of TNF-α and TGF-β decreases as compared to EIPHT but not significant.

Conclusion : The expression of TLR4/CD14 and proinflammatory cytokine in EIPHT was significantly increased; this may be due to raised portal pressure. Reduced portal pressure by Probiotic could possibly be regulating the TLR4/CD14 pathway and consequently lowering the level of cytokine expression.

Abs.CV.01

Relationship Between Blood Pressure and Arterial Stiffness in Patients Undergoing Antihypertensive Treatment

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Objective : The aim of this pilot study was to

explore the relationship between blood pressure and arterial stiffness in newly diagnosed hypertensive patient undergoing treatment.

Method : 14 newly diagnosed hypertensive male or female patients age 30-40 years participated in the study. Age, height, weight and body mass index was calculated for all patients. Blood pressure (BP) was measured using mercury sphygmanometer.Arterial stiffness were measured noninvasively utilizing the principle of photoplethysmography. BP and arterial stiffness were measured once before treatment and weakly after initiation of treatment for 3 weeks.

Results : On comparing the pretreatment and post treatment weakly BP values, a highly significant decline in the systolic BP (SBP) (P<0.006) and mean BP (MBP) (0.005) was observed, whereas diastolic BP (DBP) showed a significant (0.016) decline. Post hoc analysis revealed that SBP and DBP show a significant decline (P=0.011 and 0.027 respectively) at the second visit which is around two weeks post treatment and mean BP shows a highly significant decrease (P=0.009) at this time. Pulse pressure and heart rate did not change significantly with treatment. Parameters of arterial stiffness i.e. stiffness index (SI), peak to peak time (PPT) and reflection index (RI) did not change significantly with treatment for the same duration.

Conclusion : Thus we conclude that reduction in BP in hypertensive patients as measured clinically by brachial cuff sphygmanometry seems to be dependent on the encounter interval. The decrease in blood pressure occurs within three weeks whereas changes in arterial stiffness do not occur even till three weeks of initiating the treatment.

Abs.CV.02

Comparative Evaluation of Hypertension and Stress as Risk Factors in Myocardial Infarction in Young and Old Males

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Objective : The purpose of this study was to compare the contribution of hypertension and stress as risk factors for young and old age myocardial infarction (MI) in males and to assess if any difference, between young and old age myocardial infarction regarding etiology.

Method : The study was conducted for the period of one year. 70 myocardial infarction patients were included. Study group was divided into two, below 40 and above 60 years. From the history, examination & clinical test risk factors were evaluated. Hypertension was determined according to The Joint National Committee 7th Report. Stress, acute or chronic in the form of either acute stress disorder, or chronic stress in the form of job stress or self perceived psychological stress were considered as risk factor in this study.

Results : Mean age of older patient was 68.3 years and younger was 33.1 years. Both were compared with Fisher's exact test 2-taile. It shows P-value for hypertension was significant for older age group & stress was significant (<.001) for younger patients. 80% of older patients were hypertensive where

25% of younger were hypertensive. 80% of younger patients had stress where only 24% older patients had stress.

Conclusion : Hypertension is a strong risk factor for developing MI in old age. Stress is a strong risk factor for developing MI in young age but not in old age.

Abs.CV.03

Are We Targeting the Correct Inflammatory Markers for Heart Failure in Our Immune Modulation Therapy ?

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Objective : Heart failure (HF) pathogenesis is related to immune system abnormalities and involves different inflammatory pathways. Identifying the inflammatory markers in heart failure can help in immune therapy for HF patients.

Methodology : We studied the activation of various inflammatory markers in untreated HF patients. Twelve symptomatic but treatment-naïve patients with systolic heart failure (mean age 53.4±13.8; male) were enrolled through village community screening. In these 12 patients, a total of 22 inflammatory markers (cytokines, adhesion molecules, soluble cytokine receptors) were studied at baseline and again after 3 months treatment. We used the Randox Evidence Investigator tm array.

Results : (i) Inflammatory markers found to be significantly elevated at baseline were (parenthesis showing percent of patients above laboratory normal values) VCAM (100%), MMP9 (100%), P Selectin (86%). (ii) Inflammatory markers, less significantly elevated at baseline were IL8 (50%), ICAM (38%), IL2 (38%), TNFR1 (33%), TNFR2 (50%). (All the above inflammatory markers remained elevated after 3-months treatment). (iii) Inflammatory markers which were not elevated at baseline were IL6 and TNF alpha.

Conclusions : Inflammatory markers found to be elevated and considered as prognostic for HF (IL6, TNF alpha) by the existing studies were not found to be elevated in the present study. Inflammatory markers pointing to the activation of endothelium and platelets were found to be elevated. Further studies are required to conclusively identify the inflammatory markers involved in the pathogenesis of untreated HF. This will help in modifying the immune modulation therapy so as to target the correct inflammatory pathways.

Abs.CV.04

A Study on Echocardiographic Assessment of Left Ventricular Mass in Young Adult

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Objective : Left ventricular mass is a measurement of left ventricular hypertrophy, which is considered as an independent risk factor for sudden cardiac death. Limited data are available on distribution of LV mass and the impact of various physiological parameters on it, particularly in north eastern part of the country. With that background present study was undertaken to assess the LV mass in healthy young individuals and its relation with gender, level of blood pressure and body mass index.

Method : 200 healthy individuals in the age group of 18-22 years of either sex were selected randomly. Height and weight were measured and BMI was calculated. Blood pressure was measured as per standard guideline. Resting ECG was obtained for all the participants . LV mass was determined by echocardiography as per the formula proposed by Devereux et al :

LV mass (gm) = 1.04 [(LVID = IVSD + LVPWD)]^3 – (LVIDd)]^3 – 13.6.

Place – Department of Physiology, Assam medical College.

Period – July 2001 – June 2002.

Statistical method – Students t test was applied. P value < 0.05 was considered significant.

Results : 70% of the participants were male. 11.5% had BMI more than 25. ECG documented LVH was found in 8.5%.LV mass (mean) was higher in male than female (P<0.001).Systolic blood pressure had a positive correlation with LV mass (P<0.001), whereas LV mass was significantly high in cases with diastolic blood pressure more than 70mmhg vs. less than 70 mmhg (P<0.001). Cases with BMI more than 25 had higher mass than those with BMI less than 25 P(<0.001). ECG documented LVH did not correlate with echo derived LV mass.

Conclusion : Left ventricular mass as determined by Echocardiography was found to correlate positively with male gender, body size and level of blood pressure in healthy young individuals.

Abs.CV.05

Myocardial Performance in Newly Diagnosed Asymptomatic Essential Hypertensive Subjects

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Objective : The goal of this study was to investigate the effects of asymptomatic untreated essential hypertension on left ventricular structure and function.

Method : The left ventricular functions were assessed among 127 hypertensive and 80 healthy subjects. American society of echocardiography (ASE) convention was applied to measure the stroke volume, percentage ejection fraction, percentage fractional fiber shortening, cardiac output and cardiac index.

Results : The stroke volume, cardiac output and cardiac index were normal but significantly high among hypertensive

compared to normotensive subjects (P<0.05). The percentage ejection fraction and fractional fiber shortening were significantly reduced among hypertensives compared to normotensives (P<0.05). The significant impairment of percentage fractional fiber shortening is due to alteration in dimension of left ventricular wall thickness, left ventricular cavity and left ventricular geometry. This carries prognostic implication and requires further documentations, investigations and researches. Percentage ejection fraction and fractional fiber shortening is considered a hallmark of normal left ventricular function. The left ventricular contractile state was negatively correlated to left ventricular after load parameters.

Conclusion : The overall left ventricular systolic functions were normal amongst the asymptomatic essential hypertensive subjects. However contractility function were impaired in hypertensive individuals compared to normotensive. After-load was significantly increased amongst hypertensive. Ejection fraction and fractional shortening are hallmark of LV pump functioning.

Abs.CV.06

Risk Profile in Asymptomatic First Degree Relatives of Coronary Artery Disease (CAD) Patients

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Objective : Cardiovascular disease is on the rise and is expected to be a leading cause of death and disability worldwide. Identification of risk in asymptomatic individual in higher risk group could help to plan individual patient's management. Positive family history is one of the risk factors and screening at this level may help in determining individual therapy. Studies have shown relation of positive family history but are lacking in this part of world, so we considered it worthwhile to assess FRS in asymptomatic sibling of CAD Patients.

Method : 75 volunteers were enrolled in the study and they underwent Bruce treadmill exercise protocol after their initial evaluation, these volunteers than also underwent biochemical test. Blood sample was collected for fasting blood sugar and lipid profile. These volunteers were divided into two groups based upon their Treadmill test results.

Results : 31 out of 75 volunteers were TMT positive and they were kept in one group. These volunteers differed significantly (P<0.05) in higher age, fasting blood sugar and Low density lipoprotein level (LDL). This group also had a significantly lower metabolic equivalents and higher Framingham Risk Score.

Conclusion : Our study showed that positive family history is associated with a higher Framingham risk score in asymptomatic volunteers.

Abs.CV.07

Congenital Heart Disease : Its Prevalence and Importance in Indian Population

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Objective : Congenital heart disease (CHD) is the leading cause of infant mortality. CHD is found in 8-10 of every 1,000 live births and nearly 2,50,000 children are born with CHD each year in India. Approximately 10% of present infant mortality in India may be accounted for by CHD alone. There are a large number of children with CHD, primarily because of lack of health awareness and inadequate health care facilities. The numbers of CHD is increasing every year and impose a huge economic burden on India. Thus more research should be carried out for early detection and finding therapeutic intervention against CHD to reduce infant mortality. However, number of research studies conducted with congenital heart disease (CHD) in India is limited. The aim of this study is to find the prevalence, scope and importance of congenital heart disease in India and to find future strategies to reduce CHD.

Method : We use Google scholar and PubMed to find the research articles related to CHD in Indian population. We also collected and analyzed CHD data from our IICT and Innova Children's heart hospital, Hyderabad (collaboration study).

Results : We collected research papers related to prevalence of CHDs which are published during 1980 to 2010 in Indian population. Based on literature from 1980 to 2010 its prevalence of CHDs ranging from 0.8 to 26.4 per 1000 live births in different States. Similar to other studies in India, our study showed that out of 4098 acyanotic CHD patients the percentage of different CHD patients are as follows; ASD:20.86%, VSD:21.32%, DORV: 13.46%, PDA: 8.61%, CoA: 8.27%. Again out of 3754 cyanotic CHD patients; TOF: 29.62%, SV: 18.3%. While most of the Indian studies were carried out to find the prevalence of CHDs in Indian population, very few studies were conducted to find SNPs from candidate genes for CHD. However, none of the study showed any novel mutation from Indian population. Epigenetics of CHD is another area which has not been explored yet in Indian population.

Conclusion : CHD with Indian population is less explored and need in-depth research to find the heterogeneity of the disease and approaches to reduce infant mortality.

Abs.CV.08

Cardiovascular Risk Factors in Tobacco Smokers and Chewers

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Objective : To assess the cardiovascular risks in tobacco smokers and chewers as compared to normal population.

Method : The study was conducted in department of Physiology, department of TB Chest and department of Medicine JNMCH AMU Aligarh. The study consisted of 30 smokers, 30 tobacco chewers(in any form) and 30 subjects without any history of tobacco

consumption in any form.The age group varied from 18–65 years. Anthropometric parameters,cardiovascular parameters,lipid profile and 12 lead ECG findings of these 3 groups were compared and looked for any significance.

Results : Anthropometric measurements : Weight and BMI were significantly decreased in smokers as compared to normal population. But there was no change in chewers. Cardiovascular Parameters : Systolic pressure, diastolic pressure, pulse pressure, mean arterial pressures and pulse rate were significantly increased in smokers and chewers as compared to normal population. But there was no significant change in these parameters between smokers and chewers.

Lipid Profile : Total cholesterol, HDL,LDL was increased in both smokers and chewers as compared to control but no significant change was observed between these two groups.HDL was decreased in chewers as compared to smokers.

ECG parameters :heart rate was increased significantly in smokers and chewers as compared to control subjects. P wave duration, PR interval, QTc interval, T wave duration and MEA were with in the normal range in these three groups. QRS complex duration and TP interval were decreased significantly in smokers and chewers as compared to normal. However there was no significant change between smokers and chewers.

Conclusion : All these findings are suggestive of increased risk of CARDIOVASCULAR DISEASE in tobacco smokers and chewers as compared to non tobacco consuming population.

Abs.CV.09

Oxidative Stress : Cause or Effect of Essential Hypertension

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Objective : This study investigated the association of blood pressure with oxidative stress-related parameters in normotensive and hypertensive subject and to check the hypothesis whether oxidative stress is cause or effect of hypertension.

Method : In this cross sectional study 25 normotensive and 40 hypertensive subject were recruited. Hypertensive subject were further subdivided into three sub-group, Prehypertensive, Stage I hypertension, Stage II hypertension. Study included subject of both the sex between age group of 35-60 years. Exclusion criteria were secondary cause of hypertension, smoking, diabetes mellitus, COPD, malignancies and current use of any antioxidant or any medication.

All subject underwent blood pressure measurement and sampling of blood done. Antioxidant enzymes activity, Superoxide-dismutase (SOD), Catalase, Glutathion peroxidise (GPX), and lipid peroxidation marker Malondialdehyde (MDA) was estimated in plasma. Subject of Stage I hypertension, Stage II hypertension were given antihypertensive treatment for 3 month and estimation of SOD, Catalase, GPX, MDA was done again.

Result : Mean value of antioxidant enzymes, SOD, Catalase, GPX were significantly decreased in hypertensive subject while MDA level was significantly increased in hypertensive subject when compared to normotensive subject. Antioxidant enzymes SOD ($r = –0.773$, $P<0.05$), Catalase ($r = –0.776$, $P<0.05$), GPX($r = –0.939$, $P<0.05$) showed negative correlation with mean arterial pressure (MAP) within hypertensive group. MDA level ($r = 0.849$, $P<0.05$) showed positive correlation with MAP within hypertensive group. Mean value of antioxidant enzymes (SOD, Catalase, GPX) were significantly increased while MDA level decreased significantly in Stage I hypertension and Stage II hypertension after antihypertensive treatment.

Conclusion : Present study showed strong association of oxidative stress with blood pressure and control of blood pressure lead to reduction of oxidative stress. Comparing present study with other studies in which use of antioxidant were found to be ineffective in blood pressure reduction, it could be concluded that oxidative stress is effect rather than cause of essential hypertension.

Abs.CV.10

Study of Oxidative Stress and Antioxidants in Patients of Acute Myocardial Infarction

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Objective : Acute Myocardial Infarction is one of the major cause of mortality and morbidity in the world. Atherosclerotic coronary artery lesion has been implicated as the underlying cause of myocardial infarction. Free radicals play an important role in the pathogenesis of atherosclerotic lesion by oxidation of lipids (LDL) and connective tissue macromolecules. In this study we investigated oxidative stress, antioxidants and inflammatory molecules in patients with acute myocardial infarction.

Method : "This study has been carried out on 50 patients with acute myocardial infarction, (33 men and 17 females) admitted in the Coronary Care Unit of Jawaharlal Nehru Medical College Hospital, Aligarh Muslim University, Aligarh. The control group consisted of 50 healthy, age-matched subjects (40 men and 10 females). Levels of glutathione peroxidase, Superoxide dismutase, malondialdehyde, ceruloplasmin, were measured along with lipid profile and anthropometric data. Statistical Analysis was done by comparing data of control and cases through student's 't'-test."

Results : "Malondialdehyde and ceruloplasmin levels were significantly high and antioxidants glutathione peroxidase and superoxide dismutase were significantly decreased AMI patients as compared with control ($P<0.001$). Waist to Hip ratio and Body Mass Index showed significant increase in AMI patients as compared to control."

Conclusion : Our study shows a significant increase in lipid peroxidation in patients with myocardial infarction. A significant decreased antioxidant status was observed in AMI patients. This indicates that an imbalance between oxidants and antioxidants molecule occur in AMI.

Abs.CV.11

The Association of High Sensitivity C-Reactive Protein With Blood Pressure – A Hospital Based Study

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Objective : This study has been performed to assess the association between hsCRP and blood pressure across the range of blood pressure categories according to Joint National Committee 7.

Method : This hospital based case control study includes a total of 100 subjects. The subjects with systolic blood pressure ≥140 mmHg and/or diastolic blood pressure of ≥90 mmHg and/or is on antihypertensive drugs were considered as cases and all the other subjects as controls. The hsCRP test was performed using a high sensitivity C – reactive protein enzyme immunoassay test kit, a solid phase enzyme linked immunosorbent assay. Appropriate statistical analysis has been carried out to find out the association between hsCRP and blood pressure.

Results : The mean serum hsCrp level in hypertensive cases was found to be 2232.50±813.34 ng/ml as compared with 790±464.28 ng/ml among normotensive controls which is highly significant ($P<0.001$). It has also been observed that the hsCRP levels vary significantly with the different grades of hypertension.

Conclusion : Our study reveals a graded association between blood pressure and hsCRP elevation in people with hypertension.

Abs.CV.12

Variation of PR Interval With Gender and Increasing Age in Healthy Individuals

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Objective : The aim of the study was to note and statistically analyze the changes in PR interval with age and sex. The conclusion of the present study was compared with those of previous studies and results were drawn.

Method : Electrocardiogram from 150 apparently healthy adults in the age group of 20–80 years, were analyzed using Schiller Cardiovit AT 1,3 channeled ECG machine to establish ECG standards of normalcy for PR Interval and further to study the impact of increasing age and gender on PR Interval. ECG Lead II was relied upon to calculate the PR interval

Results : In the present study, it was observed that there was significant increase in PR interval with age specially in the age group 60–80 years. Similar result of prolonged PR interval was observed with age, when seen among males and females separately. On comparison between males and females, there was significant variation in PR interval only among age group 20–39 years with a higher value in males.

Conclusion : The increase in PR interval with aging may be attributed to widespread

histologic changes in the conduction system which lead to generalized slowing of impulse conduction through atrioventricular node and myocardium. Age associated prolongation of the PR interval probably reflects delay within the AV junction proximal to the His bundle. In the present study, the lower value of PR interval in females of age group 20-39 years as compared to males of the same age group is possibly due to a significantly higher value of heart rate in females as compared to males in this age group.

Abs.CV.13

Electrocardiographic Evaluation in Students of Physical Education : A Longitudinal Study

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Objective : Exercise is a planned, structural, repetitive and purposeful physical activity. Regular physical exercise is known to cause improvement in the cardiovascular function which is reflected in the electrocardiogram. Our objective was to study the ECG changes in the students involved in physical exercise. To study the sequence of different ECG changes. To assess the effectiveness of physical education training syllabus to induce the changes.

Method : This was a Longitudinal study where 40 subjects (21 male, 19.98 yrs ±1.127; 19 female, 19.14 yrs ± 1.89) were evaluated within seven days of admission to college and reassessed after 12 weeks using Electrocardiography and Queen's College Step test.

Results : Significant decrease in heart rate and increase in RR interval was seen in males while in females similar but nonsignificant change was seen. Repolarization change in form increase T wave amplitude was also seen in the male as well as female subjects. Sinus bradycardia was seen in 4 male subjects and 1 female subject. Aerobic power assessed by VO2max increased significantly in males as well as females.

Conclusion : The exercise training over period of three month changes the parasympathetic and sympathetic tone and improves aerobic power. Decrease in heart rate and increase in T wave amplitude are the initial ECG changes seen in athletes.

Abs.CV.14

Assessment of the Left Ventricular Activity in Young Obese Adults by Electrocardiographic Changes of QT, QTc Intervals and QT Dispersion

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Objective : To compare the changes in Heart rate, QT, QTc intervals and QT Dispersion among obese and normal weight individuals subjected to treadmill exercise test.

Method : 30 obese and 30 normal weight young medical students aged 18–22 years studying in JSS Medical College constituted the study and control group respectively. Treadmill testing was carried out according

to standard Bruce protocol. Heart rate, blood pressure and estimated work load in metabolic equivalents (METs) were noted. QT interval, corrected QT (QTc) interval and Dispersion QT (QTD) interval were calculated using the following formulae :

QT – calculated from ECG.

QTc = QT/√RR (Bazett's formula)

QTD = QTmax - QTmin (In any two leads)

Results : Statistical analysis was carried out by Repeated Measure ANOVA using SPSS version 16. P value <0.05 was taken as statistically significant. In the study group, QT (Mean ± S.D : 410±0.7) and QTc (Mean ± S.D: 439.8±0.76) intervals were prolonged compared to control group which was statistically significant. QTD (Mean ± S.D: 56.0±0.11) was similar to that of control group.

Conclusion : QT and QTc was increased in obese subjects with wide range of body mass indices but still clinically asymptomatic as compared to age- and sex-matched healthy normal weight controls. Therefore, QT interval analysis is a cost-effective and non-invasive tool to detect high-risk subjects for cardiovascular complications.

Abs.CV.15

Heart Rate Variability : Is There Any Difference Between Young Indian and Non Resident Indian Females ?

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Objective : Heart rate variability (HRV) is the simplest and most widely performed measure of cardiac autonomic function. Decreased HRV implicates an increased risk of arrhythmic events and an increased mortality. HRV is influenced by genetic, many environmental and behavioral factors. The present study was an attempt to investigate the difference in the HRV between the people of same origin but born and brought up in a different social, environmental and cultural set up i.e. between the young Indian females and young Non-resident Indian (NRI) females.

Method : HRV of Sixteen Indian female students of mean age 18.41±0.5 and seventeen NRI females students of mean age 18.63±0.5 were analyzed using HRV software. HRV was analyzed both by time domain and frequency domain methods during normal breathing.

Results : We observed that there was no statistical significant difference in the heart rate variability of Indians and NRIs. But the values of all the variables of time domain method and HF power and HFnu by frequency domain method during normal breathing were higher in Indians.

Conclusion : our study shows that probably Indians have a better parasympathetic tone compared to NRIs but it did not reach statistical significance level because of smaller sample size.

Abs.CV.16

Effect of Missing RR Intervals on Approximate and Sample-Entropy Based HRV

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Objective : In the measurement of biosignals associated with the heart rate, artifacts in the electrocardiogram recordings deteriorate the data, yielding missing RR interval tachogram. The linear parameters of heart rate variability are very sensitive to these missing RR intervals. In this study, the effect missing RR intervals on approximate entropy (ApEn) and sample entropy (SampEn) based entropy measures of HRV is investigated, using simulated missing data in real RR interval tachograms.

Method : For the simulation, randomly selected data (0–100 RR intervals) were removed from real RR data obtained from the MIT-BIH normal sinus rhythm database. In all, 703 tachograms of 1000 RR interval data length were used for this analysis. ApEn and SampEn are statistical indicators to quantify the complexity of a signal which has been widely adopted by many researchers especially in the field of heart rate variability. The popularity of entropy stems from its capability to provide quantitative information about the complexity of the experimental data that are short in data length.

Results : The relative error in entropy measures increase more significantly in function of missing RR proportion. The results of the simulation revealed that entropy parameters are more robust measures than linear parameters of HRV in presence of missing RR interval data.

Conclusion : The finding of the present study can be partly used as a reference for the acceptable amount of missing RR intervals for the ApEn and SampEn based HRV assessment. The entropy based HRV quantification is not a reliable indicator for variability signal with missing data. However, this method has certainly edge over commonly used linear parameters and can be preferred for tachograms having missing RR intervals.

Abs.CV.17

Comparison of Cardiac Autonomic Activity Between Malnourished and Healthy Children

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Objective : Severe malnutrition can significantly compromise autonomic nervous system. However, less is known about the cardiac autonomic activity in mild and moderate grades of malnutrition in children. Therefore, the objective of this study was to assess the effect of mild/moderate malnutrition on heart rate variability (HRV), a non invasive tool to estimate the cardiac autonomic activity.

Method : A cross sectional, community based study was conducted in which 35 malnourished children (mean age: 6.06±2.04 yrs), on the basis of anthropometric parameters, were enrolled in the study group by random samplings, who were the children of urban slum dwellers. And 35 age and sex matched healthy children, were taken as controls. Grading of malnutrition was done according to Indian Academy of Pediatrics

(IAP) classification. Anthropometry, basal heart rate (BHR), blood pressure was determined. Time domain and frequency domain indices of HRV were assessed using RMS Polyrite D (version 2.4).

Results : Weight, height, mid arm circumference (MAC) and body mass index (BMI) were found to be statistically lower in the study group. There was a strong negative correlation between MAC and LF component (P<0.01). BHR was found to be increased in the malnourished group (P=0.027). Low frequency (LF) & LF-HF ratio were found to be increased (P=0.001) while high frequency (HF) component was decreased (P=0.013) in malnourished group.

Conclusion : Our results suggested that impaired cardiac autonomic nerve function characterized by sympathetic over activity may occur in malnourished children. This study also enables us to compare, in future works, HRV in pediatric subjects with different grades of malnutrition.

Abs.CV.18

Regulation of Cardiac Autonomic Functions During a Cold Pressor Test in Normal and Overweight Adults

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Objective : To assess Cardiac Autonomic Activity in Normal and Overweight Adults.

Method : In this study, the cardiac autonomic activity in normal and overweight adults was assessed and compared. About 50 subjects 22 boys and 28 girls (17-20 years) were divided into groups 1 and 2 based on their BMI levels(Group 1: BMI< 25 AND Group 2: BMI >25). ECG recording was done during normal breathing, deep breathing and cold pressor conditions. HRV was done in the Time Domain in accordance to the task force. Analysis of HRV in the time domain was done using the software version 1.1 AIIMS, New-Delhi. The data obtained was analysed using student's T test followed by Mann-Whitney U test and P<0.05 was considered the level of significance.

Results : In the Time Domain method, the mean value of SDANN in group 1 was higher than in group 2. RMSDD of group 1 also showed higher values in comparison to group 2.

Conclusion : Those subjects with a normal BMI showed a better HRV response to Cold Pressor indicating a better parasympathetic activity than the obese adults.

Keywords : HRV, BMI, SDANN

Abs.CV.19

Heart Rate Variability (HRV) is Better Diagnostic Tool for Early Detection of Autonomic Nervous System Involvement in Generalised Anxiety Disorder (GAD)

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Objective : Generalised Anxiety Disorder (GAD) and its association with cardiovascular

morbidity is world known. Autonomic cardiac function tests, especially Heart Rate Variability (HRV), have been extensively studied in GAD patients but studies correlating HRV and Galvanic Skin Response (GSR) with GAD are very few. Heart Rate Variability (HRV) is primarily controlled by continuous interplay of sympathetic and vagal activity. Both time and frequency domain parameters were used to assess HRV. GSR is a type of an electrodermal response that represents a change in the electrical conductivity of skin caused by an increase in activity of sweat glands, in accordance with changes in sympathetic activity.

Method : HRV and GSR were studied in Generalised anxiety disorder patients diagnosed as per ICD-10 guidelines with Hamilton Anxiety Scale score of 28 (moderate anxiety). Study was carried out on 30 male Generalised Anxiety Disorder (GAD) patients of 18-45 years of age and 30 normal age and sex matched subjects.

Results : During HRV analysis, the low value of time domain parameters indicate decreased HRV in male GAD patients as compared to male controls. Less value of both low & high frequency variables and high LF/HF ratio (frequency domain parameters) in male GAD patients as compared to male controls, during basal recording is suggestive of relatively more reduction in parasympathetic tone in GAD patients. But the results with GSR were not so encouraging (insignificant) as with HRV.

Conclusion : HRV appears better diagnostic tool than GSR, for early detection of autonomic nervous system involvement in GAD patients.

Abs.CV.20

Cardiac Autonomic Tone of Workers Engaged in Casting and Forging Industry : A study in India

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Objective : In Indian casting and forging SMEs, hazardous environmental conditions are inevitable. Developing countries like India lag far behind in implementing occupational health and safety programmes in their industries. Therefore present study assumes its significance for the assessment of cardiac autonomic tone (HRV) parameters among casting and forging industry workers.

Method : The study included an exposed group of 138 male workers with mean age (SD) of 29.56 (7.62) years and mean exposure (SD) of 8.25(5.30) years of casting and forging industry and a control group of 50 male subjects with mean age (SD); 31.30 (8.59) years and mean experience (SD); 8.36(6.52) years. Both the groups were assessed for autonomic activity using time domain components of HRV (mean RR, mean HR, SDNN, RMSSD, NN50, pNN50) and frequency domain components of HRV (sympathetic (LF), parasympathetic (HF) activities and S-V balance (LF/HF) ratio. Short term ECG (5 min) was recorded at acquisition sampling rate of 512 Hz.

Results : The exposed group subjects showed significantly decreased resting heart rate mean Heart rate (SD); 68.27 (10.23) beats/min as compared to the control group subjects with

mean Heart rate (SD);74.24 (10.26) beats/min at p value less than 0.05. At the same exposed group showed significantly increased levels of parasympathetic activity as reflected in NN50, pNN50, power in high frequency band of power spectrum (HF). Moderate alcohol intake with heavy physical activities significantly increased the difference between the two groups for HRV components.

Conclusion : The study concluded that in Indian SMEs, the risks of developing cardiovascular pathologies due occupational hazards were possibly annulled by the heavy physical activities at work place. The hazardous effect of noise was observed in the form of hearing loss and adaptability to the noisy environment. An exposure of less than a decade to hostile environmental factors and work place heavy activities showed improved HRV components. The control group subjects live a sedentary life style without adequate physical work; therefore they showed decreased HRV components.

Abs.CV.21

Heart Rate Variability (HRV) Response to Holding 5 ml of Water and 5 ml of Olive Oil in the Mouth

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Objective : To study the changes in Heart Rate Variability (HRV) in response to holding 5 ml of water and olive oil (Figaro) in the mouth for 5 minutes in healthy volunteers.

Method : 7 healthy volunteers (men-2, women-5; Age 22-36 years) participated in this study. Institutional ethical committee clearance has been taken. HRV was recorded with Anu-Photo Transmission Rheograph (BARC-Mumbai). The volunteers came to the department in the morning at 9 AM after an overnight fast and rest. Fasting HRV was recorded for 5 minutes. Later the volunteers were asked to hold water (5 ml) in the mouth for 5 minutes and then after 5 minutes rest, to hold olive oil (5 ml) in the mouth for 5 minutes and HRV was recorded for 5 minutes during both periods.

Results : Results were analysed for low frequency power (LF: 0.01 Hz to 0.1 Hz), high frequency power (HF: 0.1 Hz to 0.4 Hz), and LF/HF ratio. LF and HF are expressed in normalized units as mean ± S.D. At fasting the mean LF, HF, and LF/HF ratio were 22.21±17.75, 20.57±10.77 and 3.04±4.87 respectively. In the HRV recorded during holding water(5ml) the mean LF, HF, and LF/HF ratio were 23.81±10.65, 26.78±14.41 and 1.94±2.79 respectively. In the HRV recorded during holding olive oil (5 ml) mean LF, HF, and LF/HF ratio were 29.66±16.96, 26.96±11.54 and 1.53±1.42 respectively.

Conclusion : A increase in the HF power and decrease in LF/HF ratio was observed while holding 5 ml of water and olive oil in the mouth for 5 minutes. This shows that holding of water and olive oil in the mouth causes a decrease in sympathetic activity and increase in parasympathetic activity.

Abs.CV.22

Study of Cardiac Autonomic Neuropathy In Hypertensive Subjects

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Objective : To assess the cardiac autonomic nerve function status in patients with essential hypertension by analyzing time domain measures of heart rate variability.

Method : 50 hypertensive and 50 normotensive male subjects between the age group of 40-60 years were selected. Computerized ECG system with Nivi qure software was used for the study. Time domain measures of heart rate variability such as mean RR intervals, Mean HR, SDNN(ms), RMSSD and PNN50% were assessed to observe both sympathetic and parasympathetic nerve function status. Heart rate variation during deep breathing(HRV db) was done to assess sympatho-vagal balance. Statistical analysis was done by using unpaired t-test was used.

Results : Time domain parameters like SDNN (ms), RMSSD, PNN 50% were significantly (<0.001) reduced in hypertensive subjects compared to normotensives. Mean heart rate was higher in subjects with high blood pressure (0.001). HRV db was significantly (0.001) lower in hypertensive subjects compared to normotensive subjects.

Conclusion : Impaired cardiac autonomic nerve function characterized by sympathetic overactivity and reduced vagal activity was found in hypertensive patients.

Abs.CV.23

Comparison of Heat Rate Variability Patterns Between Normal Subjects and Patients with Coronary Artery Disease

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Objective : Coronary artery disease (CAD) is a major cause for morbidity and mortality. CAD leads to fatal complications like fibrillation. The complication arises out of autonomic imbalance. Efforts are made to compare the HRV pattern in normal subjects and patients with CAD.

Methods : Thirty patients in the age group of 40 to 65 years admitted to M.S. Ramaiah hospitals with CAD and posted for percutaneous transluminal coronary angioplasty (PTCA), satisfying inclusion and exclusion criteria served as cases. Age and anthropometrically matched normal subjects attending master health check up served as controls. An informed written consent was obtained. ECG was recorded for duration of 10 min following rest for 15 min in supine position. The pattern of HRV was analysed by RMS Vagus HRV software. Frequency and time domain parameters were expressed as mean and standard deviation, used for comparison.

Results : The time domain parameters SDNN (standard deviation of normal to normal), rMSSD (root mean square of standard deviation), pNN50 were significantly higher in controls (P=0.001). In frequency domain parameters, LF-low frequency power (P=0.040) and LF/HF ratio (P=0.004) was higher in cases and HF -high frequency power

(P=0.046) was higher in controls.

Conclusion : Analysis of time domain parameters indicate a better heart rate variability and parasympathetic predominance in controls. Analysis of frequency domain parameters indicate higher sympathetic tone in patients with CAD. Normal subjects had higher parasympathetic tone. Patients with CAD had a tilt of sympathovagal balance towards sympathetic predominance.

Abs.CV.24

Study of Relationship Between Age, Anthropometric Parameters and Heart Rate Variability

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Objective : Hear rate variability (HRV) is non invasive economical tool used to assess the autonomic function. It is influenced by a number of factors and diseases. In our study, the relationship between age, anthropometric parameters and HRV has been studied.

Methods : Subjects in the age group of 40 to 65 years attending the master health check up at M.S Ramaiah hospitals were recruited for the study. The height and weight were measured using standiometer and sensitive balance respectively. BMI was calculated as weight/height^2 (kg/m^2).Waist circumference was measured at a point equidistant from lowest rib and highest point on the iliac crest. The hip circumference was measured at greater trochanter, waist hip ratio was calculated. ECG was recorded after a rest of 15 min for duration of 10 minutes in supine position. HRV was analysed by RMS Vagus HRV software. Frequency and time domain parameters were expressed as mean±SD.

Results : There was a positive correlation between age and SDNN, LF, LF/HF ratio, a negative correlation with rMSSD, pNN50, HF. There is a positive correlation between waist hip ratio with pNN50 and LF/HF ratio, negative correlation with rMSSD, HF.

Conclusion : There was alteration in the sympathovagal balance with age and waist hip ratio. There was sympathetic predominance with advancement of age and increase in waist hip ratio, however there was no significant correlation between HRV parameters and BMI. The trends observed can be established with larger sample size.

Abs.CV.25

Effect Of Physical And Mental Stress On Heart Rate Variability (HRV)

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Objective : Stress is a huge problem in the present scenario, which may lead to work related illness directly or indirectly. It affects many physiological parameters in human body. The goal of our study was to evaluate the changes in heart rate variability due to physical and mental stress.

Method : In laboratory set up, 15 subjects (10

males, 5 females) of mean age 23±5 years were taken. In each of the subject, baseline ECG was recorded for 5 minutes. After which each of them were subjected to mental (reverse calculations) and physical stress (45 degree shoulder abduction) with 15 minutes rest period in between. Spectral analysis of HRV was used which is characterized by four main components: high frequency (HF) component (.15Hz – .40 Hz), low frequency (LF) component (.04 Hz – .15 Hz) and the very low frequency (VLF) component (.003 Hz – .04 Hz) were measured.

Results : The results indicated that most of the components of HRV were sensitive to physical and mental demands. Statistically significant change in heart rate was observed during the physical and mental stress as compared to resting condition. Increase in LF domain and LF/HF ratio was seen more with stress (mental stress > physical stress) while HF domain decreased with stress as compared to rest.VLF had variable results in all the subjects.

Conclusion : Both physical and mental stress influence risk factors that may increase risk for cardiovascular diseases. Thus, it is recommended workplace be redesigned to reduce excessive physical and mental demands.

Abs.CV.26

Unlike Severe Depression the Moderate Depression does not Increase the Cardiac Morbidity

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Objective **:** *In the modern scenario, depression is one of the major clinical problems affecting 350 million people globally.* The psychological disorder is multifaceted and it affects an individual's mental and physical health. *Depression is well associated with the co-morbid cardiac diseases. The present study has been designed to assess the cardiac stress associated with the moderate depression*

Method : This study was conducted in Department of Physiology and Department of Psychiatry at Pt. B. D. Sharma, PGIMS, Rohtak. The study is a randomized controlled trial. Forty male patients of moderate depression (*group-I)* according to ICD-10 (the international classification of diseases-10) in the age group of 18-40 years and forty normal (*group-II)* age matched male subjects were compared by frequency domain parameters of heart rate variability (HRV) (20). Informed and written consent was taken from every patient and subject for undergoing the whole procedure. All experiments were conducted between 10am to 1pm to avoid diurnal variations.

Results : No significant association was found between group-I (patients of moderate depression) and group-II (normal subjects) as comparisons of all the parameters were statistically insignificant.

Conclusion : The cardiac stress is minimal in case of moderate depression.

Abs.CV.27

Acute Affective Responses to Maximal Graded Exercise in Untrained Subjects

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Objective : The present study was conducted to assess the acute effects of a single bout of maximal-intensity graded exercise on the affective response in young, untrained subjects

Method : Twelve young, healthy, untrained subjects (age- mean±SD) (18.58±0.90 yrs) performed maximal graded test until volitional exhaustion on a computer-based motorised treadmill. Affective valence (pleasure-displeasure) was assessed using feeling scale (FS), activation (low-high) by felt arousal scale (FAS) and perceived exertion by Borg's modified scales which were recorded repeatedly before, during (30 sec before the end of each stage) and post-exercise (immediately, 5 and 10 min after). FS is a single-item 11 point bipolar scale ranging from –5 (very bad) through 0 (neutral) to +5 (very good). FAS is a six-point scale ranging from 1(low arousal) to 6 (high arousal). Borg's modified scale ranges from 6 (no exertion at all) to 20 (maximal exertion). Data was analysed using repeated measures Anova.

Results : Exhaustion time during maximum exercise averaged 8.01±0.99 min. There was a significant increase in post-exercise FAS scores ($F=12.11$, $P<0.001$, partial = 0.52) and perceived exertion ($F=93.42$, $P<0.001$, partial = 0.895). Variable responses were obtained in FS score (positive mood swing in 7 & negative in 5). However, no significant difference was observed in FS scores following maximal graded exercise ($P>0.05$).

Conclusion : Maximal graded exercise induces activated pleasure (Energetic arousal) in a few subjects while activated displeasure (Tense arousal) in others. Further studies with larger sample size are however needed for statistical validation.

Abs.CV.28

Comparative Study of Cardiovascular Endurance in Swimmers and Non-swimmers

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Objective : Today people are more aware of the fact that physical exercise will not only decrease the incidence of health problems but also lead to an improved quality of life and longevity. The objective of this study was to compare cardiovascular endurance in terms of Physical Fitness Index (PFI) and Resting Heart Rate in swimmers and non-swimmers.

Method : In this study 60 male medical students of age group 18-25 years were taken. They were divided into two groups, each group comprising of 30 subjects. One group comprised of swimmers who were practicing for atleast three months regularly with one session of 30-60 min duration per day and minimum three days in a week and other group comprised of non-swimmers having sedentary life style and not undergoing any physical exercise. Their resting heart rate was measured; also their Physical Fitness Index was determined by simple exercise step test (Harvard's step test). Physical Fitness Index

(PFI) in two groups was compared in terms of excellent, good, average and poor by "Chi-square test". The significance of difference between mean values of Resting Heart Rate and PFI of the two groups was found out by Unpaired "t" test.

Results : This study indicates statistically significant difference (P<0.00) in Resting Heart Rate and Physical Fitness Index between the two groups. In swimmers, the mean resting heart rate was significantly lower than non-swimmers. Also the mean Physical Fitness Index (PFI) was significantly higher in swimmers as compared to non-swimmers.

Conclusion : This study shows the importance of physical exercise like swimming performed regularly helps to improve the cardiovascular endurance in the form of more economical heart functioning.

Abs.CV.29

Effect of Endurance Training on Cardiac Sympathovagal Tone During Post Exercise Recovery

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Objective : (1) To study heart rate (HR) recovery and alterations in blood pressure after exercise in trained and untrained males. (2) to analyze time and frequency domain of Heart rate variability (HRV).

Method : The study included 60 male volunteers of age group 20-35 years consisting of 30 endurance-trained males and 30 untrained males. Detailed clinical history &preliminary medical examination was done to rule out any cardiovascular disease.HR and systolic (SBP) &diastolic blood pressure (DBP) were measured at rest &after exercise. Subjects performed maximal continuous graded exercise test on bicycle ergometer. Protocol consisted of 5min warm-up period at a load of 60 watts followed by an incremental protocol with work rate increasing by 30 watts at every 3 min until exhaustion. Rating of perceived exertion (RPE) to exercise was obtained immediately after exercise. ECG was recorded at rest &after exercise and analyzed with power spectral analysis of HRV.

Results : Trained group had faster HR recovery after exercise. Both SBP & DBP after exercise in trained males was higher than control group with greater percent decrease in both SBP & DBP after exercise.

Trained group had higher mean RR interval, higher standard deviation of normal-to-normal RR interval (SDNN), higher high frequency (HF) power &lower LF/HF ratio at rest compared with controls.

Conclusion : Endurance trained males have lower resting HR than non-exercising males indicative of higher cardiac vagal tone, which could be in part responsible for faster HR recovery. Exaggerated BP response in trained males reflects greater capacity of reflex cardiovascular modulation after exercise.

Abs.CV.30

Gender Differences in Cardiovascular Response to Upper Limb Isometric Exercises

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Objective : Isometric exercise remains an important modality in patient's rehabilitation and also employed in advanced strength and endurance training programs. It is a major criteria in exercise prescription. Numerous studies attempting to explain gender differences in cardiovascular response to isometric exercise are inconsistent at best and conflicting.

The purpose of this study was to determine if the cardiovascular responses to upper limb isometric exercises differ between healthy normotensive male and female students.

Method : Normotensive 30 males and 30 females in the age group of 18-30 years were randomly select. Their anthropometric variables namely height, weight and body mass index were recorded. Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP), Heart Rate (HR) and Rate Pressure Product (RPP) before and after 3 upper limb isometric exercises were used to assess the cardiovascular response. Student's paired t-test was used to compare intra group pre and post exercise cardiovascular parameters. Unpaired t-test was used to compare physical characteristics and pre and post exercise cardiovascular parameters between gender. Level of significance was set at $P<0.05$.

Results : Post exercise cardiovascular parameters were significantly greater ($P<0.05$) than baseline values without gender bias. However the post exercise HR, SBP, DBP and RPP were significantly greater in males than females.

Conclusion : Highly significant increase in post exercise HR, SBP,DBP and RPP in males compared to females indicates men undergo significant changes in either cardiac output, total peripheral resistance, or increase in level of circulating catecholamines mainly epinephrine with many possible explanations. Also significant increase in myocardial oxygen uptake indicated by RPP.

Abs.CV.31

Lifestyle, Body Composition, Physical Fitness and Cardiovascular Reactivity in the Urban and Rural Gujarati Indian Adolescents : A Comparative Study

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Objective : To determine the differences in the lifestyle, body composition, physical fitness, blood pressure and cardiovascular reactivity that may be existing between urban and rural Gujarati adolescents so as to learn how lifestyle (sleep, meal frequency and physical activity) and body composition affect physical fitness, blood pressure and cardiovascular reactivity in Gujarati Indian Adolescents.

Method : A cross-sectional study was conducted on 324 urban and rural adolescent Gujarati Indian adolescents. Sleep Duration at night, meal frequency and physical activity status were reported subjectively. Body composition was assessed in terms of weight,

BMI, Body Fat % (BF %), Fat Mass Index (FMI) and waist circumference using standard techniques. Physical fitness was assessed in terms of Predicted VO_2max., Blood pressure was measured by oscillometric method and cardiovascular reactivity was assessed using isometric hand grip test.

Results :Urban adolescents had a significantly (P-value <0.05) lesser sleep duration, greater meal frequency and higher adiposity as compared to their rural counterparts. Predicted VO_2max was found to be significantly (P-value <0.05) lower in urban adolescents as compared to the rural counterparts. The study did not find any significant differences in the blood pressure profile between the two groups. However, urban girls showed a significantly (P-value <0.05) higher % Rise in Diastolic Blood Pressure to Isometric Handgrip Test as compared to the rural girls.

Conclusion : It may thus be concluded that unhealthy lifestyle in Gujarati Indian adolescents predisposes them to higher adiposity levels, lower physical fitness, higher cardiovascular reactivity and thus hypertension.

Abs.CV.32

Life Style Behaviours and Exercise Prescription

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Body of the abstract

Objective : To study Life Style Behaviors and Exercise Prescription because Lack of sufficient physical activity is the second most important contributor to preventable deaths trailing only to tobacco use. A sedentary life style has been linked to 28% of deaths from leading chronic diseases. Phyical inactivity is the biggest health problem of 21st century. National programme for Mental Health prevention and control of Communiable & Non communicable diseases,smoking & cancer prevention etc. are already launched . India is expressing a rapid health transition with Non communicable diseases surpassing the burden of communicable diseases. Exercise Programs are Cost Effective and Beneficial in Secondary and Tertiary Rehabilitation.

Method : Willium D. McArdle, Frank I. Katch, Victor L Katch in Exercise physiology 7th edition (2010) texted Five life style behaviors that add years to life. 1) Do not smoke 2) Drink moderately (no more than a glass of wine,a half a pint of beer,or one shot of ;liquor per Day 3 Keep physically active,either on job or in leisure time 4 Eat five servings of fruits and vegetable daily 5 control body weight and blood pressure. Haskell and Pollock US Department of Health and Human Services. (1996) gave Classification of physical activity based on physical activity lasting up to 60 minutes .Written informed consent was taken from 90 subjects (10 subjects for each physical activity) at random those cleared physical activity readiness questionnaire to estimate relative intensity by noting percentage of estimated maximum heart rate. 220 - age in years;heart rate was observed by radial pulse within ten seconds then multiplied by six to get beat per minute just at the end of one hour of different physical activity.

Results : In this study intensity range in form of percentage of maximum heart rate (MHR) for theory class room session was 42.00%, for slow walking was 44.98% (light intensity range up to 49% of MHR), for volleyball 53.94%, for yoga 54.80%, for dance 56.78%, for brisk walking 64.98% (moderate intensity range 50-69% of MHR), for basketball 76.73%, for football 77.31%, for jogging 85.44% (hard intensity range 70-100% of MHR).

Conclusion : Life Style Behaviors & Exercise Prescription become wonderful drug if it is prescribed in form of frequency-intensity-time-type (FITT) that prolongs life, reverses aging process in many ways & add years to life. Moderate intensity exercise gives maximum health benefits.

Abs.CV.33

Plasma Apelin Responses in Pulmonary Artery Hypertension

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Objective : Restoration of depressed plasma apelin peptide levels is a presumptive prognostic marker in cardiovascular disorders. Plasma apelin levels were estimated in patients with pulmonary artery hypertension (PAH) secondary to mitral valve stenosis (MS), before and three months after percutaneous mitral commissurotomy (PTMC) with prior ethical approval (IESC/T-18/04.12.09).

Method : Venous blood was collected after informed consent from ten MS patients, before and three months after PTMC, and from age-matched normal controls, respectively. Plasma apelin was estimated by competitive enzyme linked immunoassay kit (RayBiotech), following manufacturer's protocol. Plasma BNP was estimated using an auto-analyzer (Triage®). All values are expressed as mean ±S.E. and P-value <0.05 was considered significant.

Results : PTMC resulted in decrease in pulmonary artery pressures from 64±7.2 mm Hg to 42±6.9 mm Hg (P=0.001). Plasma apelin in PAH patients was 368.8±78.2 pg/ml compared to 786.6±184.7 pg/ml in normal controls (P=0.03). Plasma BNP in PAH patients was 74.2±25.2 pg/ml compared to 9.6±2.4 pg/ml in normal controls (P=0.03). Plasma apelin and BNP levels were 342.2±56.3 pg/ml and 58.9±14.6 pg/ml at three months after PTMC, respectively (P>0.05).

Conclusion : In our study, plasma apelin level was low in patients of MS with PAH compared to normal subjects and did not show any significant rise post PTMC, although plasma BNP level showed decreasing trend (not significant). Further studies with larger sample size are required to establish any correlation.

Abs.CV.34

EMG and Extracellular Potassium Changes During Muscular Fatigue-Correlation with Normal Individuals and Sports Persons

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Objective : Fatigue is a very complex phenomenon in which multiple sites fail during muscular work. The underlying causes of fatigue fall into one of two categories: central (neuromuscular—the mind/central nervous system) and local (peripheral—the actual muscle site). Susceptibility to fatigue can be high or low depending upon the lifestyle of individuals. Studies have shown that more active the lifestyle of a person in terms of physical activities less susceptible he is to early fatigue. La Forest S et al have mentioned that muscles of active individuals demonstrated a greater resistance to fatigue than those of sedentary individuals. On the basis of above findings the aim of the study is to: Correlate the changes in fatigue onset between normal individuals and sportspersons by conducting bicycle ergography and mossos ergography. Evaluate the factors which cause postponement of fatigue.

Method : Total number of participants was 40 out of which 20 participants where normal individuals and 20 were skilled in sports. They were matched for age and sex with no complaints of any cardiovascular, respiratory and muscular disorders. The participants were required to do the bicycle ergography till the onset of fatigue for the lower limb which was recorded on the first day. Again the next day the participants were required to perform Mosso's ergography for the upper limb till the onset of fatigue. Action potential was recorded by using the physiograph to determine the onset of fatigue. Venous blood samples were collected from the ante-cubital vein before and after the exercises to evaluate the changes in the extracellular K+ levels by an automated analyzer. The statistical analysis was done by using the Z test for testing the significance of the differences between the normal group and the sportspersons group.

Results : Significant changes in the pre and post exercise extracellular K+ levels were found in the both the groups. Significant delay in the onset of fatigue was found in the groups having sportspersons.

Conclusion : It was found that sportspersons displayed more delayed fatigue onset than normal individuals and changes in K+ levels were prominently observed in normal individuals than in sportspersons as seen in similar studies.

Abs.CV.35

Pulse Wave Velocity in Healthy Children and Adolescents.

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Objective : Present study was carried out to assess arterial stiffness in normal Indian children and adolescents by pulse wave velocity.

Method : The study was conducted in 25 healthy male children (group I) and 25 healthy adolescent males (group II) whose mean age, height and weight was 9.10 years, 121.05 cm, 25.27 kg and 18.40 years, 172.72 cm, 63.8 kg respectively. Children with family history of vascular disease were excluded. Pulsations of femoral artery in inguinal region and of dorsalis pedis artery in the dorsum of foot were marked in supine position. Then volume

transducers were placed, one on each site and connected to two channel polyrite (INCO) and recording was done simultaneously on polyrite at speed of 50 mm/second. Distance between proximal and distal point was measured with a measuring tape and pulse wave velocity was calculated from graphs. Two vertical lines were drawn at the beginning of ascent of two records and the distance (say X mm) between two lines was measured. As speed of graph paper was 50 mm/second, therefore

Time = X ÷ 50 milliseconds

Pulse wave velocity = Distance between proximal and distal points (mm) ÷ Time (milliseconds)

The pulse wave velocities of two groups were compared by unpaired 't' test

Results : In group I & II the pulse wave velocity was 5.49±2.67 and 8.69±1.88 mm/ milliseconds respectively and this difference was highly significant (P<0.001).

Conclusion : Arterial stiffness starts very early in Indian children.

Abs.CV.36

Reversal of Systemic Arterial Stiffness After Renal Transplantation

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Objective : Patients of End Stage Renal Disease (ESRD) have an increased risk of cardiovascular events. Aortic stiffness is an established independent predictor of cardiovascular morbidity and mortality in ESRD patients. Carotid femoral Pulse Wave Velocity (c-f PWV) and Augmentation Index (AI) are the indices which are used for non-invasive assessment of aortic stiffness. Renal transplantation (RT) as a treatment modality in ESRD patients is associated with improvement in cardiovascular survival .Whether this improvement is due to attenuation of aortic stiffness has been inadequately studied. The present study was conducted in ESRD patients before and 3 months after renal transplantation to assess the reversibility in abnormalities of vascular compliance known to be associated with adverse outcome.

Method : Aortic stiffness indices – Carotid femoral Pulse Wave Velocity (c-f PWV) and Augmentation Index (AI) were measured using applanation tonometry(sp) in 21 ESRD patients (age: 37.4±6.8 years) before and 3 months after successful RT.

Results : After transplantation AI values significantly reduced as compared to their pre-transplant values (27.43±11.69% vs. 17.14±9.48 %, P<0001) while the c-f PWV values did not show any significant difference (8.77±2.08 m/s vs. 8.84±3.30 m/sec).

Conclusion : Restoration of renal functions following successful renal transplantation is associated with differential effect on the two indices of aortic stiffness. The salient finding of our study is that 3 months after transplantation, functional changes in vasculature bring significant reduction in augmentation index while structural changes

(pulse wave velocity) may take longer to show an improvement.

Abs.CV.37

Assessment of Endothelial Function in COPD Patients

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Objective : To assess endothelial function in COPD patients compared with age matched controls.

Method : Patients with stable COPD (FEV1<0.07) are being enrolled for the study. The patients having any history of diabetes, hypertension, chronic kidney disease, collagen vascular diseases are excluded from the study. An equal number of age matched healthy, non smoker voluntary males are being enrolled as control subjects. Reactive hyperemia as a measure of endothelial function is being assessed by using Photoplethysmography technique (PPG).The digital pulse waveform is being analyzed to assess following parameters-Maximum slope and amplitude.

Results : We have enrolled 8 COPD patients and 8 controls till now. Mean age of patients is 51.2±4.9 yrs. In controls, there is significant increase in pulse wave amplitude within 1st minute (0.09149±0.02625) (P value <0.01) and in 2nd minute (0.0912±0.03798) (P value <0.01). There is also significant increase in maximum slope with in 1st minute (1.165±0.4271) (P value <0.01) & in 2nd minute (1.175±0.4159) (P value <0.01). Whereas in patients there is no significant increase in pulse wave amplitude and maximum slope (P value >0.05) in 1st & 2nd minutes from the baseline.

Conclusion : The preliminary result shows impairment of endothelial function in patients of COPD as assessed by reactive hyperemia.

Abs.CV.38

Flow Mediated Vasodilation – A Diagnostic and Prognostic Tool for Assessment of Cardiovascular Function

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Objective : To study the difference in Flow Mediated Dilation (FMD) among smokers and non-smokers. To study the correlation of FMD with Blood Pressure (BP) among smokers and non-smokers.

Method : 60 healthy males, aged between 20-30 years inclusive of non-smokers (n=30) and asymptomatic cigarette smokers (n=30) were considered for this study. Following baseline BP and brachial artery diameter recording, FMD was done by inflating BP cuff proximal to the elbow 50mmHg above the systolic BP(SBP). Shearing stress caused by the occlusion of brachial artery for 5min followed by its release caused FMD. (Purposive sampling; 95% confidence level & 90% power).

Results : An inverse correlation was seen

between FMD and SBP among non-smokers, which wasn't seen with the smoking group. It was shown by multiple stepwise regression analysis that FMD was dependent either on SBP or the brachial artery diameter among non-smokers. This was in contrast to smokers where FMD was based on the brachial artery diameter. By considering a reference of SBP to be 120 mmHg it was observed that FMD was well preserved among non-smokers with SBP <120 mmHg, whereas it was lower in non-smokers with SBP ≤120 mmHg and also in smokers.

Conclusion : FMD is well preserved in subjects with SBP <120 mmHg and shown to be impaired in cigarette smoking to a great extent, with a loss in association between FMD and SBP. This new in-vivo technique can be used for diagnostic as well as prognostic assessment of cardiovascular diseases.

Abs.CV.39

Relation of Height and Great Saphenous Venous Pressure in Patients with Chronic Venous Insufficiency

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Objective : Incompetence of the deep, superficial and/or perforating veins leads to raised venous pressure in the lower leg, which can result in skin changes and ulceration which are referred as chronic venous insufficiency (CVI). Skin changes and venous ulcerations are difficult to heal and so preventive measures should be taken prior to development of CVI. In this study we want to know the relation between height and CVI, so preventive measures can be taken in tall subject.

Method : A cross sectional type of observational study was done on 57 patients with CVI with incompetent sapheno-femoral junction, at the Department of Tifac- Core of Interventional Radiology in collaboration with Department of Physiology, JNMC, Sawangi (M), Wardha. Height of the patient was measured by measuring tape. Percutaneous puncture of the vein was performed under ultrasound guidance just above medial malleolus with 18 gauge direct puncture needle through which guide wire assembly followed by 5 – French Catheter was inserted in saphenous vein which was connected to intravenous pressure measurement manometry system to measure the pressure.

Results : Positive correlation was found between height (mean = 1.68 m) and saphenous venous pressure in supine position (mean = 11 mm). 12.9% variation observed in pressure in supine is due to the increased height. Standardized coefficient was found to be "Height = 0.355 PS" ($t=2.815$, $P<0.01$). Positive correlation was found between height (mean=1.68 m) and saphenous venous pressure in Valsalva maneuver (mean=23 mm). 11.9% variation observed in pressure on Valsalva maneuver is due to the increase height. Standardized coefficient was found to be "Height = 0.344 PV" ($t=2.731$, $P<0.01$).

Conclusion : This study shows that increase in height is associated with increase in great saphenous venous pressure in supine position ($r=0.355$, $P<0.05$) and on Valsalva maneuver

(r=0.34, P<0.05). Height act as a risk factor in development of CVI, and prevention should be taken in tall subjects.

Abs.CV.40

Assessment of Cardiac Function During Immersion of Face in Water in Humans

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Objective : To observe the changes in the following parameters during breath-hold face immersion in water : Heart rate by using Electrocardiograph. Left ventricular End diastolic volume. Left ventricular End systolic volume. Left ventricular Stroke volume. Left ventricular Cardiac output. Left ventricular Ejection fraction.

Method : 15 healthy male swimmers of the age group 20 to 35 years, who swim at least two hours per week were selected for the study. A written consent was obtained after explaining the procedure in detail to the subject. The procedure consists of holding the breath at the end of a deep inspiration and immersion of face in water kept in a plastic basin for as long as it is comfortable for him. Heart rate was recorded before and during the procedure using Lead 11 ECG. Left ventricular end diastolic volume and end systolic volume were recorded before and during the procedure using 2D-Echocardiograph (calculated by area–length method) with the help of an inbuilt software. Left ventricular stroke volume was calculated as the difference between the left ventricular end diastolic and the end systolic volumes. Cardiac output was obtained as the product of stroke volume and heart rate. Left ventricular ejection fraction was calculated as the ratio of stroke volume to the end diastolic.

Results : After analysis of the data using the Non Parametric test (Wilcoxon signed ranks test) for the 15 subjects, the following changes were observed :

There is a statistically significant reduction in heart rate. There is a statistically significant increase in Left Ventricular End Diastolic Volume as well as Left Ventricular End Systolic Volume. Even though there is an increase in the calculated Left Ventricular Stroke volume & a decrease in the calculated Left Ventricular Cardiac output, they were found to be of NO statistical significance. The Left Ventricular Ejection fraction showed a statistically significant reduction.

Conclusion : Bradycardia is a common feature observed in both actual diving and breath-hold face immersion in water. The significant increase observed in the Left ventricular end diastolic volume in the present study, differs with some of the previous observations of actual diving. The significant reduction in the ejection fraction may be beneficial by conserving a little extra oxygen which can be utilized by the brain. However more studies using larger samples comparing the changes between the actual diving and breath-hold face immersion in water may help to decide the correlation between the two. Once this correlation is established, the efficacy of the diving reflex may be conveniently assessed in prospective divers using the method employed in this study.

Abs.CV.41

A Study of Autonomic Function on Cardiovascular System

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Objective : To establish the relation of autonomic function on CVS according to body mass index. To establish the relation of autonomic function on CVS according to life style.

Method : Present study was done on 200 cases among medical students and stuff members, in the age group 18 to 35 yrs of Jorhat medical college, Jorhat. For parasympathetic functions following tests were performed: Deep breath tests and Valsalva test. For sympathetic functions following tests were performed : Standing test for orthostatic hypotension and Hand grip test.

Results : It was observed that there was significant difference in vulsalva ratio between BMI (18.5–24.9) and BMI <18.5. P value <0.05. Comparison of valsalva ratio between BMI (18.5-24.9) and BMI (25-24.9) has highly significant difference. P value <0.01 Comparison of BMI (18.5-24.9) and BMI (30-40) shows that valsalva ratio was very highly significantly decreased in BMI (30-40). P value <0.001 The valsalva ratio Obese case was decrease then that of normal cases. Sympathetic activities was more in sedentary lifestyle compared to that of active lifestyle, but there was no statistically significant difference in any of the tests P value <0.05.

Conclusion : The following relation was established that there is a relationship of autonomic function with BMI. As BMI increase parasympathetic decrease and sympathetic activities increase. It was found that there was significant decrease in valsalva ratio in BMI (25-29.9), and BMI (30-40) compared to that of normal BMI (18.5-24.9). On the other hand it was found that there was significant increase in hand grip test in BMI (25-29.9) and BMI (30-40) compared to that of normal BMI (18.5-24.9) Parasympathetic activities decrease in sedentary life style and sympathetic activities increase compared to that of people of active life style.In active people parasympathetic activities is increase which is beneficial to human body, sympathetic activities reduced.

Abs.CV.42

To Study The Correlation Between : A) BMI and Pulse Rate and Blood Pressure B) W/H Ratio And Pulse Rate and Blood Pressure in Normal Healthy Students

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Objective : This study was undertaken to study the correlation of two basic and cardiovascular parameters, viz pulse and blood pressure with a) BMI b) Waist to hip ratio (W/H ratio) in normal healthy subjects.

Method : Subjects selected were healthy medical students of this institution of age group 19 to 21 years. Blood pressure was recorded using sphygmomanometer. Three consecutive readings (at 5 minutes intervals)

were recorded for both pulse rate and blood pressure (systolic and diastolic).

Results : On statistical analysis of the results it was that pulse rate systolic blood pressure as well as diastolic blood pressure showed significant positive co-relation with BMI and waist to hip (W/H) ratio. These results are comparable to those obtained by other workers.

Conclusion : The positive correlation obtained could possibly act as an indicator about the tendency of a person to possibly develop hypertension with resultant complications on the future. Therefore, regular periodic assessment of pulse and blood pressure and correlation it to body mass index and body surface area may help to serve as a preventive tool.

Abs.CV.43

Blood Pressure Response to Cold Pressure Test in Normal Young Healthy Subjects

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Objective :

- To study the response of cold stimulus on blood pressure in study group.
- To find out prevalence of vascular systolic and diastolic hyperreactors in study group.

Method : As Vascular hyperreactivity is associated with development of various cardiovascular diseases, it can be ascertained by a simple "Cold Pressure Test". Present Study was carried out on 35 apparently healthy medical students between the age of 17-20 years at Autonomic Function Lab, Dept.of Physiology, Govt. Medical College, Bhavnagar. In present study fully automated upper arm style blood pressure monitor was used to measure blood pressure in sitting position. Dominant hand of subjects were submerged in to cold water (4-8ºC) for 2 minutes and blood pressure was recorded from opposite arm at 0 minute (Basal) and 2 minutes of emersion. Subjects having rise in systolic blood pressure of 15 mmHg or more at 2 minutes from basal were considered as Systolic Hyperreactors and subjects having rise in diastolic blood pressure of 10 mmHg or more at 2 minutes from basal, were considered as Diastolic Hyper-reactors.

Results : In present study, Systolic hyperreactivity was observed in 8.57% subjects. Diastolic hyperreactivity was observed in 42.86% subjects. Positive correlation was also found between vascular hyperreactivity and subject with positive family history.

Conclusion : This study suggests that Systolic or diastolic hyperreactivity may be easily assessed in subjects by cold pressure test. There may be higher prevalence of vascular hyperreactivity even among apparently healthy young subjects. There may be relation between positive family history and vascular hyperreactivity.

Abs.CV.44

Is Cold Pressor Test a Better Predictor of Sympathetic Activity Compared to Acute

Exercise in Assessing Cardiac Autonomic Modulation ?

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Objective : Spectral analysis of heart rate variability provides an index of relative sympathetic and parasympathetic nervous system activity during exercise and also during cold pressor test (CPT). CPT triggers in healthy subjects a vascular sympathetic activation and an increase in blood pressure. Physical exercise is associated with parasympathetic withdrawal and increased sympathetic activity resulting in increase in heart rate. The purpose of this study was to find out which among the two, is a better predictor of sympathetic activity in assessing cardiac autonomic function.

Method : In this study 50 students in the age group of 17 to 20 years attended the study voluntarily, the sympathetic and parasympathetic components of cardiac autonomic nervous system assessed and compared after CPT and acute exercise. ECG recording was done during normal breathing, deep breathing, and cold pressor and after acute exercise. Analysis of HRV in the frequency domain was done using the software version 1.1 AIIMS, New-Delhi. The data obtained was analyzed using student's T test followed by Mann-Whitney U test and $P<0.05$ was considered the level of significance.

Results : Results showed LF during CPT 50.52±25.15 and during exercise 41.29±20.03. LF during CPT was more than LF during exercise but which is not significant. HF during CPT (1084.2±853.9) was lesser than during exercise (1172.4±839.6) which is not significant.

Conclusion : The findings in healthy subjects suggest that in the clinical setting increase in cardiac sympathetic activity is more during Cold pressor test when compared to acute exercise.

Abs.CV.45

Effect of Ramadan Fasting on Cardiovascular Autonomic Function Tests Among the Healthy Male Muslims of Guwahati City

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Objective : To examine the possibility that observance of Ramadan fasting by Muslims of Guwahati City is associated with modification of the Sympathetic and Parasympathetic functions in the subjects included in the study.

Method : 32 healthy male subjects in the age group of 40-60 ,who had been observing the Ramadan regimen from childhood were selected. They were normotensive with no known history of circulatory, renal or endocrine disturbance. The tests were done during the 2nd week and 4th week of Ramadan and 2 weeks after the end of Ramadan. The tests done were : Assessing sympathetic function : i) Heart rate response to standing (30:15 ratio) (electrocardiograph). Assessing parasympathetic function : i) Blood pressure response to standing (mercury sphygmomanometer). ii) Blood pressure response to sustained handgrip (modified

handgrip dynamometer (LABOMED) and mercury sphygmomano-meter)

The results were compiled and statistically tabulated using the repeated measures ANOVA test. Appropriate post test was done when the probability was <0.05.

Results : The mean HR response (30:15 ratio) was SIGNIFICANTLY higher 2 weeks AFTER the end of Ramadan fasting as compared to the values DURING the 4th week of Ramadan. The BP response to standing was also SIGNIFICANTLY higher in the 2nd week AFTER Ramadan fasting as compared to the values DURING Ramadan. The BP response due to the sustained handgrip was increased after Ramadan, but it was NOT SIGNIFICANT.

Conclusion : Our study has shown that cardiovascular autonomic functions during Ramadan among muslims of 40-60 years age are significantly altered. However more conclusive results will probably be obtained with further studies involving a greater number of subjects of different age groups.

Abs.CV.46

Comparative Study of Autonomic Functions in Children of Hypertensive and Normotensive Parents

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Objective : To assess the autonomic functions in children of hypertensive parents and compare with children of normotensive parents and also to look hyper reactors in between them. To predict the future hypertension in the subjects so that earlier remedial measures can be taken.

Method : A total 50 healthy young subjects of either sex between 19-24 years were selected for the study and divided into two groups, offspring of hypertensive (25 cases) and Normotensive parents (25 controls). Both sympathetic and Para-sympathetic activity was assessed by simple non-invasive autonomic function tests like orthostatic hypotension test (OHT), Hand grip test (HGT), cold pressor test (CPT), lying to standing test, deep breathing test and Valsalva maneuver.

Results : The observed L: S ratio and deep breathing test was significantly less in children of hypertensive than those of normotensive parents with significant negative correlation with age ($P<0.0001$). A significant rise ($P<0.001$) in Valsalva ratio was found in offspring of hypertensives. The fall in SBP during OHT was found to be more ($P<0.01$) in children of hypertensives when compared with controls. The rise in DBP during CPT and HGT was also significantly high ($P<0.0001$) among cases when compared with age matched controls.

Conclusion : The result reflects exaggerated sympathetic responses while diminished Para sympathetic responses except Valsalva ratio in subjects with positive family history of hypertension, posing a high risk of developing hypertension in future. In conclusion a positive family history of hypertension having greater genetic inheritability contributes to the pathogenesis of hypertension.

Abs.CV.47

Anthropometric Indices of Healthy Adults with Family History of Hypertension in Amritsar City (Punjab)

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Objective : 1. To Study anthropometric measurements in adults having family history of hypertension. 2. Preventive measures that can be taken to prevent morbidity and mortality caused by hypertension.

Method : The present study consisted of 200 healthy adults (20-30 years of age) of Amritsar city (100 having family history of hypertension and 100 age matched adults serve as control group).The basic anthropometric measurements of height, weight, hip circumference, waist circumference and the derived indices body mass index (BMI),waist hip ratio (WHR) and waist height ratio (WHtR) were determined from these basic measures. The results were statistically analysed by using SPSS Software version 17.0.

Results : The various basic and derived anthropometric indices showed changes in healthy adult offspring of the parents with history of hypertension.

Conclusion : All the derived anthropometric indices (BMI, WHR, WHtR) are significantly increased in young healthy adults having positive family history of hypertension.

Abs.CV.48

Effect of Syringic Acid (SA) Treatment on Cardiac Remodeling and Antioxidant Enzymes in Nω-Nitro-L-arginine Methyl Ester Hydrochloride (L-NAME)-induced Hypertensive Rats

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Objective : The present study investigates the effect of syringic acid (SA) treatment on cardiac remodeling and antioxidant enzymes in Nω-Nitro-L-arginine methyl ester hydrochloride (L-NAME)-induced hypertensive rats.

Method : Hypertension was induced in adult male albino Wistar rats, by oral administration of L-NAME (40 mg/kg b.w.) in drinking water for 4 weeks. After 4 weeks of treatment, blood pressure and oxidative stress markers were measured, cardiovascular remodeling were determined using morphological changes and langendorff isolated perfused heart system.

Results : The L-NAME- hypertensive rats showed significant increase in systolic, diastolic blood pressure, heart rate, left ventricular developed pressure and morphological changes. L-NAME- rats also showed significant increase in the levels of lipidperoxdation markers in plasma and tissues and significant decrease in nitric oxide metabolites (nitrite/nitrate) levels in plasma and aorta. The activities of enzymic antioxidants and non enzymic antioxidant in erythrocyte, plasma and tissues were also significantly

decreased. Oral administration of syringic acid (50 mg/kg b.w.) four weeks brought back all the above parameters to near normal level. These results were supported by histopathological studies of aorta and heart.

Conclusion : The results of the present study suggest that syringic acid ameliorated the cardiovascular remodeling in L-NAME-induced hypertensive rats.

Abs.CV.49

Morin Ameliorates Cardiovascular Remodeling in Deoxycorticosterone Acetate (DOCA)-Salt Hypertensive Rats

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Objective : Hypertension is the chief risk factor for developing cardiovascular diseases, including stroke and heart failure. This study investigated whether oral administration of morin prevents cardiovascular remodeling in deoxycorticosterone acetate (DOCA)-salt hypertensive rats.

Method : Hypertension was induced in uninephrectomized rats (UNX) by weekly twice subcutaneous injection of DOCA (25 mg/kg) and 1% NaCl in the drinking water for six consecutive weeks. After six weeks of treatment, blood pressure and oxidative stress markers were measured. Cardiovascular remodeling was determined using morphological changes and isolated langendorff heart preparation.

Results : The DOCA-salt hypertensive rats showed significant increase in systolic, diastolic blood pressure, heart rate, left ventricular developed pressure and organ weights (kidney, heart and aorta). DOCA-salt rats also showed significant increase in the levels of thiobarbituric acid reactive substances, lipid hydroperoxides and conjugated dienes in plasma and tissues (kidney, heart and aorta), and significant decrease in body weight, nitrite and nitrate levels in plasma. The activities of enzymic antioxidants such as superoxide dismutase, catalase and glutathione peroxidase in erythrocyte and tissues were also significantly decreased. Oral administration of morin (50 mg/kg) daily for six weeks brought back all the above parameters to near normal level. The above findings were confirmed by histopathological evidences (kidney, heart and aorta).

Conclusion : The results of the present study strongly suggest that morin ameliorated the cardiovascular remodeling in DOCA-salt hypertensive rats.

Abs.CV.50

Prevalence of Hypertension and Its Association with Obesity in School Going Children (5-15 Years)

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Objective : The present study was done to know the distribution of blood pressure, prevelance of hypertension and its association

with obesity in the school going children of 5-15 years age group

Methods : Ten public schools of Rohtak city, Haryana were selected and a total of 3108 children were included in the study. Separate groups of boys and girls were made and they were further subdivided in ten groups on the basis of age. The systolic and diastolic blood pressures were recorded and values more than 95th percentile for age and sex were chosen to indicate hypertension. Height and weight were recorded and body mass index (BMI) calculated. The criteria for obesity was BMI > 22.6 kg/m^2. Prevalence of hypertension was studied in relation to obesity in various age groups. The data collected was subjected to appropriate statistical analysis. Correlation between hypertension and obesity was derived.

Result : Results revealed prevalence of systolic and diastolic hypertension and obesity among boys and girls. Karl Pearson's coefficient of correlation method revealed significant correlation between obesity and hypertension.

Conclusion : Clinical hypertension has its roots in childhood. Routine blood pressure examination should be made mandatory in pediatric health care. The higher risk children should be considered for close follow up and modification of risk factors.

Abs.CV.51

Physical Fitness Index status of Cyclists in Bijapur District with Supplementation of Antioxidant (alpha-tocopherol)

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Objective : Exercise increases oxygen consumption and causes disturbance of intracellular pro-oxidants and antioxidant homeostasis. Athletes are exposed to acute and chronic stress that may lead to increased generation of oxidative species and increased generation of oxidative stress. Hence Antioxidant supplementation is supposed to reduce the cell damage. Therefore the present study is undertaken.

Method : Forty cyclists belonging to age group of 18-19 years, trained under District Youth Service and sports office were selected as study group. Further they were divided in to two groups, one experimental (n=19) taking vitamin E (Tab. Evion 200 mg/day) and another placebo group (n=18) taking (pudinhara tab/day) for 21 days. Control group were selected randomly among I M.B.B.S students of BLDEU's sri BMPMC, Bijapur. The Anthropometrical measurements like Age (yrs), Height (cms), Weight (Kg), BSA (sq. mts), BMI (Kg/m^2) and body fat %, Lean body mass were recorded. Physical Fitness Index(PFI) was measured by using Harvard step test.

Results : There was no significant difference in age,height, weight, BSA, BMI and lean body mass, Body fat% between control and study group ($P>0.05$)but mean score of PFI in study group(84.68) was significantly higher than control(74.25) where $P<0.001$. Whereas comparative values of PFI in Experimental and Placebo group before and after supplementation of alpha-tocopherol (vitamin

E) did not show statistically significant differences (P>0.05).

Conclusion : In conclusion supplementation of antioxidant alpha-tocopherol(vitamin E) has got no beneficial effect on Physical Fitness Index in Cyclists, but antioxidant may help in reducing the markers of oxidative damage after exercise.

Abs.CV.52

Lack of Protective Effect by 4-Aminopyrdine in Verapamil Induced Bradyarrhythmia in Isolated Perfused Rabbit Heart

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Objective **:** 4-aminopyridine (4-AP) had been shown to reverse the adverse effects of verapamil toxicity in animals and human beings. The protective effect of 4-AP was thought to be due to a direct effect on the heart and due to an indirect effect caused by the stimulation of sympathetic system.To study the effect of 4-AP on verapamil induced bradyarrhythmia in isolated perfused rabbit heart.

Methods : The project was approved by the Institutional Review Board and by the Institutional Animal Ethics Committee. Hearts were harvested from six New Zealand white male rabbits after anesthesia with 60 mg/kg Ketamine and 4.6 mg/kg Xylazine given IM in the hind limb. The hearts were perfused with oxygenated mammalian ringer at 37 degree Celsius in a Langendorff system. Lead II ECG was recorded on a computerized data acquisition system (CMC DAQ) by using electrodes kept on right atrium and left ventricular apex. Initially the heart was perfused with normal mammalian ringer for 30 minutes. Then the solution was changed to mammalian ringer containing 10 µM verapamil and perfused till the heart rate became 50% or lower and subsequently the solution was changed to mammalian ringer containing 10 µM verapamil and 100 µM 4-AP and perfused for a minimum period of 20 minutes. This was followed by perfusion with normal solution.

Results : The heart stopped in 5 out of the 6 experiments when perfused with verapamil. 4-AP perfused along with verapamil didn't revive the heart but the heart could be revived by subsequent perfusion with normal solution. However the heart rate was low. In one experiment the heart rate decreased with verapamil and further decreased when perfused with verapamil and 4-AP. On perfusing with normal solution the rate increased but it was still low.

Conclusion : 4-AP didn't reverse the bradyarrhythmia induced by verapamil. Intact sympathetic system may be required for the protective effect of 4-AP to manifest.

Abs.CV.53

A Study to Simulate Dive on Healthy Participants and to Record Heart Rate Changes on Laboratory Basis

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Aim : To determine the Heart rate (HR) changes in a simulated dive.

Objective : To trigger human diving response in laboratory and to measure HR changes.

Material and Method : In this study 30 healthy voluntarily participates with no cardio-respiratory illness have to hold their breath in air and water at around 15 pC in a plastic tub for 30 seconds at our laboratory. Their HR was measured using a automated instrument (Schiller's multipara monitor).

Results : In 1st part of experiment i.e. breathing in air has shown no significant change in HR during the course of 30 secs, while in the 2nd part i.e. holding breath in cold water has shown a strong significant change in heart rate from an average of 108.97 to 70.8 with a difference of 38.17 ($P < 0.0001$). The comparison of the difference in HR from 0 to 30 seconds of 1st and 2nd part of the experiment has shown that an average of difference in HR from 0-30 secs of 3.2 and of 38.17, respectively with difference of 34.97 ($P < 0.01$). It indicates a significant decrease in HR occurs in simulating dive as compared with breathing in air.

Conclusion : This laboratory based study succeeded in eliciting human diving response of decrease in HR and has made this complex response easy to perform, understand and use in drowning rescue.

Abs.CV.54

Cognitive Functions of Newly Diagnosed Hypertensive Patients and Patient on Antihypertensive Drugs

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Objective : To assess cognitive functions in newly diagnosed hypertensive patients, patients already on drug treatment for more than 5 years and healthy sex and age matched controls.

Method : The study included 30 patients of newly diagnosed essential hypertension (Group II), 30 patients of hypertension undergoing drug treatment for the period of more than five years (Group III) and 30 healthy age and sex matched controls (Group I). Event related potential P300 were recorded using EMG EP MK II (RMS, Chandigarh). Results were compared using ANOVA.

Results : Event related potential P300 latency of group I (283.7±9.69 ms), group II (302.98±13.1 ms) and group III (293.35±11.42 ms) showed a significant ($P < .001$) difference between the groups using ANOVA. On individual comparison between the groups using post hoc tuckey's test there was a significant ($P < .001$) increase in P300 latency of group II compared to control and group III. P300 amplitude of group I (6.88±2.14 μv), group II (3.64±1.7 μv) and group III (3.96±1.38 μv) showed a significant ($P < .001$) difference between the groups using ANOVA. While on individual comparison showed that there was a significant ($P < .001$) decline in P300 amplitude of group II and III compared to control group I. also there was no significant difference in amplitudes of group II and III.

Conclusion : We conclude that newly diagnosed hypertensives have a decline in cognitive P300 latency and amplitude and patients on treatment have improvement in some components of cognition.

Abs.CV.55

Influence of Dietary Habits on Blood Pressure in Preadolescent Boys of Coastal Karnataka

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Objective : Indices of blood pressure variability provide a window to the autonomic modulation of heart. Several factors influence the maintenance of blood pressure of which diet plays a major role. Non – vegetarian diet is associated with increased risk of hypertension. High cardiovascular responses to stress in non – vegetarian diet indicate a greater risk of developing hypertension. The present study was conducted to compare the blood pressure variability with respect to diet in pre – adolescent boys of coastal Karnataka.

Method : The study was conducted on 100 vegetarian and 87 Non-vegetarian pre-adolescent boys from a private High School of Mangalore aged between 9-13 years. The parameters studied were Age, Height, Weight, BMI and Blood Pressure (Basal Supine, Lying to standing and hand dynamometer stress blood pressure in standing posture).

Results : The results showed that basal systolic and diastolic blood pressure were increased in non-vegetarians ($P<0.001$). Both systolic and diastolic blood pressure showed a statistically significant increase in non-vegetarians from lying to standing position ($P<0.0001$ and $P<0.001$ respectively), and similar results in hand dynamometer stress response ($P<0.0001$ and $P<0.001$ respectively) (Mann Whitney' test). There was no significant difference in BMI between the study groups.

Conclusion : Diet regulates blood pressure by influencing the autonomic activity as early as pre adolescent age group. A better Parasympathetic tone observed in vegetarians compared to non vegetarians and sympathetic over activity in non vegetarian pre adolescent boys may explain the results. This may act as a predisposing factor for the future development of cardiovascular disorders in non vegetarians.

Abs.CV.56

Effect of Losartan on Cardiac Autonomic Functions of Rats During Acute and Chronic Inhibition of Nitric Oxide Synthesis

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Objective : The present study was planned to investigate the effect of losartan on baroreflex sensitivity (BRS) and heart rate variability (HRV) of adult Wistar rats during acute and chronic inhibition of nitric oxide synthesis by NG-nitro-L-arginine methyl ester (L-NAME).

Method : BRS was determined from heart rate responses to changes in systolic arterial pressure

achieved by intravenous administration of hypertensive (phenylephrine) and hypotensive (sodium nitroprusside) stimuli. Time and frequency domain measures of HRV were calculated from 5-minute electrocardiogram recordings.

Results : Chronic L-NAME administration (50 mg/kg per day for 7 days, orally through gavage) increased mean arterial pressure (MAP), heart rate but significantly decreased BRS. In addition, a significant fall of standard deviation of normal R-R intervals, total spectral power, high frequency spectral power and a rise of low frequency to high frequency (LF:HF) ratio was seen. Acute L-NAME administration (30 mg/kg, intravenous bolus dose) also raised MAP and impaired HRV but it was associated with augmented BRS for bradycardia reflex. Losartan treatment (10 mg/kg, i.v.) in both acute and chronic L-NAME treated rats, decreased MAP but the difference was not significant. However, Losartan administration normalized depressed BRS for bradycardia reflex and significantly reduced LF to HF ratio in chronic L-NAME treated rats. But this improvement was not observed in acute L-NAME group.

Conclusion : These results indicate importance of mechanisms other than renin - angiotensin system in the pressor response of both acute as well as chronic L-NAME. However, autonomic dysregulation especially following chronic L-NAME appears to be partly angiotensin dependent.

Abs.CV.57

A Preliminary Study of Autonomic Function in Panic Disorder Patient

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Objective : Panic disorder is suggestive of autonomic nervous system dysfunction, especially in the cardiovascular system. Equivocal and conflicting reports of sympathetic and parasympathetic abnormalities are reported in various literatures. So the present study was undertaken to study the effect of autonomic nervous function in patients with Panic disorder.

Methods : 12 Panic disorder patients (mean age, 34.5±13.13) recruited from Psychiatric OPD, RIMS and 24 healthy subjects (mean age, 30.45±10.43) were evaluated for autonomic function using standard cardiovascular reflex test. Parasympathetic function was assessed by measuring heart rate response to deep and slow breathing (HRDB, beats/min); Valsalva manoeuver (VR) and lying to standing (30:15 ratio). Sympathetic response was assessed by change in blood pressures in sustained hand grip (SHG) and lying to standing tests.

Results : The results heart rate is higher in panic disorder patients than the normal controls (81±16.48 vs 69.29±9.58). The resting systolic blood pressure (120±44 vs 114.5±14.55) and resting diastolic blood pressure (80.83±11.64 vs 75.25±10.05) also in higher side in patients compared to normal subjects. The parasympathetic reactivity; HRDB is lower in patients compared to normal (1.28±0.11 vs 1.34±0.14) whereas, VR and 30:15 is higher in patients compared to

controls (VR=1.67±0.30 vs 1.56±0.28; 30:15=1.23±0.16 vs 1.19±0.15). The sympathetic reactivity measured by sustained hand grip at 4 min systolic blood pressure is higher in patients compared to normal subjects (22.33±11.99 vs 20.41±10.84) whereas the diastolic blood pressure at 4 min is lower in patients compared to normal subjects (19.16±9 vs 21.66±9.44).

Conclusion : Since the number of patients is less, proper statistical analysis cannot be done as of now. However my findings till date hypothesize reactivity was higher in Panic disorder patients compared to normal controls. The parasympathetic function is not conclusive. The detail results will be presented at the time of presentation.

Abs.CV.58

Co-relation of Level of Stress in Different Age Groups With the Levels of hs-CRP, a Sensitive Predictor of Coronary Events

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Objective : To co-relate the stress level with the levels of C-reactive protein in different age groups.

Method : The study was conducted on healthy, normotensive, non diabetic males. The study group selected was voluntary blood donors in the age group of 20–50 years. The sample size was restricted to 60. The level of risk of illness due to stress was assessed by providing the questionnaire to the voluntary blood donors. The level of stress was assessed by Holmes and Rahe stress scale. During blood donation, the sample was taken for estimation of C – reactive protein (CRP), using hs CRP kit. The level of stress and the levels of CRP were tabulated and the significance was assessed using appropriate statistical method.

Results : An increase in the level of stress with increase in age, and a linear increase in CRP levels with increasing stress level and increase in age, with a P value of 0.006 was observed (statistically significant). Also, more importantly there was a drastic raise in the CRP levels in the age group of 30-40 years in the high risk group which indicates that this particular age group is vulnerable for development of coronary vascular disease.

Conclusion : In this competitive modern world where stress is unavoidable, there is a need for lifestyle modification and stress management right from the age of 30-40 years, as the present study depicted a significant association between this particular age group and high CRP levels – a risk for coronary vascular disease.

Abs.CV.59

Influence of Genetic Predisposition on Blood Pressure Response To Exercise, Left Ventricular Mass And Hemodynamics of Systemic Circulation in Healthy Normotensive Individuals

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Objectives : Cardiovascular abnormalities in adults that result from long standing hypertension may be present to some degree in children before systemic pressures become elevated. Therefore, normotensive offspring of hypertensive parents are ideal subjects for studying the cardiovascular alterations that could precede the development of hypertension.

Material and Methods : 50 healthy normotensive medical students with BP of <120/80 mmHg with family history of hypertension and 50 healthy normotensive students without family history of hypertension formed the study and control group. BP, weight, height and waist circumference of these subjects were recorded. Exercise ECG test was done on Treadmill using Bruce Protocol where HR and BP were recorded at baseline, at the peak of exercise and during recovery phase at the end of 2 minutes. Their hemodynamic characteristics were studied noninvasively with Echo Doppler study.

Results : In comparison to students who were children of normotensive parents, students with family history of hypertension showed significantly higher –

1.1 Base line systolic, diastolic and mean arterial pressures, though the values were within normal limits.

2.2 Mean waist circumference and BMI.

3.3 Mean SBP at the peak of exercise.

4.4 Mean Left Ventricular Mass Index and Stroke Volume Index.

Conclusion : Thus genetic predisposition coupled with central obesity, which is related to unhealthy lifestyle and partly may be genetically determined, are responsible for elevation in the levels of BP during rest and stress. These observations have an important implication in terms of planning and implementing preventive strategies in high-risk individuals who are apparently normotensive, in order to prevent and control the increasing burden of hypertension and its related morbidity and mortality.

Abs.CV.60

Cold Water Immersion Test for Assessing Peripheral Circulatory Function

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Objectives : The response to cold immersion is used to assess vascular disorders. The aim of this study is to evaluate baseline and cold stress test values in controls and to determine the changes in blood pressure and heart rate due to cold. This study provides a comprehensive overview of the human physiological responses to acute cold exposure.

Methods : In a cross sectional study, 20 healthy young adults, with mean age 18.4±0.68yrs, mean height of 161.1±7.7cms and mean weight of 59.3±10.86 kg were considered. Measurements of indirect blood pressure by Sphygmomanometer were made before the test and at 1min, 3min and 5min after immersion of the hand upto the wrist in cold water maintained at 5°C. The initial 60

secs of the test represented vascular reactivity to the cold stimulus, and the hemodynamics at 5mins of hand immersion represented the degree of circulatory adaptation to this stimulus. The statistical analysis was done by paired t-test.

Results : Most patients responded to the cold pressor test with statistically significant increase in diastolic blood pressure than systolic blood pressure. Heart rate increased significantly (P<0.0001) after 1min of immersion, and by the end of 5 mins it reached pre normal values (P<0.0001). Blood pressure decreased maximum at 5 min (P<0.0001). Significant changes are observed at 1 minute of immersion and body adapts at the end of 5 minutes. However further cross-sectional studies will be carried out in the future to compare the response of normal subjects with subjects having vasomotor disorders.

Conclusion : Significant changes are observed at 1 minute of immersion and body adapts at the end of 5 minutes. However further cross-sectional studies will be carried out in the future to compare the response of normal subjects with subjects having vasomotor disorders.

Abs.CV.61

Cardiovascular Responses to Isotonic and Isometric Exercise in Healthy Young Adults

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Objective : The present study has investigated cardiovascular responses to isotonic and isometric exercise in healthy young adults.

Methods : The study was carried out on 39 healthy young male adults free from any disease were chosen as subjects of the study. The parameters of the study include heart rate, blood pressure and electrocardiogram. The blood pressure was recorded using sphygmomanometer. Heart rates were calculated from ECG tracings. Schiller 12 lead electrocardiograph was used for recording ECG. Isotonic exercise was carried out using bicycle ergo-meter and isometric exercise using hand grip dynamometer.

Results : The results were analyzed for statistical significance with paired T test. There was a rise in heart rate, but the rise was more significant in isotonic as compared to isometric exercise. Systolic blood pressure showed a significant rise in both isometric and isotonic exercise, the rise being more marked in isotonic exercise. Diastolic blood pressure showed a significant fall in isotonic exercise and this fall was not restored to normalcy even after five minutes of rest after the exercise. In contrary, isometric exercise showed a rise but it was not statistically significant. After the isometric exercise, the diastolic blood pressure was returned to normal. ECG revealed a significant shortening of PR and RR intervals in both isometric and isotonic exercises, the significance being more in isotonic. QT and QTc interval showed a decrease in isotonic exercise, the shortening being statistically significant with QT. However both QT and QTc intervals were prolonged in isometric exercise the increase

being statistically significant with QTc interval. The P wave interval showed an increase in isotonic exercise and a decrease in isometric exercise. But the changes were not statistically significant. The QRS intervals were increased in both isotonic and isometric exercise but they were not statistically significant. The voltage of S (V1) showed a significant change with isometric exercise. The voltages of P (II), S (V1) and R (V5) did not show any significant variations either in isotonic or isometric exercise.

Conclusion : The changes in heart rate and systolic blood pressure can be explained on the basis of increased sympathetic activity leading to increased frequency and force of contraction of the heart. The fall in diastolic blood pressure could be due to both increased sympathetic vasodilator activity and accumulation of metabolites in the exercising muscle, leading to a fall in total peripheral resistance. The shortening in PR and RR intervals are due to increased discharge of pacemaker activity by sympathetic stimulation.

Abs.CV.62

Effect Of Exercise On Heart Rate Variability (HRV) In UG Medical Students

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Objective : To study the effect of exercise on heart rate variability in male and female under graduate students and to compare pre and post exercise findings.

Method : This study has been conducted in clinical laboratory, Physiology department.

The pulse rate by 3 finger method, arterial blood pressure by sphygmomanometer, Heart Rate Variability (HRV) with Annuphotorheograph was measured before exercise and after exercise. Harvard step test was used as exercise method. HRV data was analyzed to get HRV graph and FFT (Fast Fourier transform) power spectrum. The results were statistically analyzed by applying paired “t” test.

Results : In our study, the basal recording showed that mean pulse rate, the mean systolic blood pressure (SBP) and mean diastolic blood pressure (DBP) were higher in male. The VLF (very low frequency) was significantly high in males. The HF (high frequency) was significantly high in females.

After exercise, the pulse rate and the systolic blood pressure were significantly increased and the diastolic blood pressure was significantly decreased in both groups. The HRV and its frequency components in all frequencies were decreased significantly in both groups. The VLF was significantly high in males and HF was significantly high in females.

Conclusion : Our observation of pulse rate, arterial blood pressure and HRV, before and after exercise suggests that autonomic modulation of heart rate during exercise is associated with withdrawal of parasympathetic activity in both the sex and increased sympathetic drive in males at rest and predominant parasympathetic drive in females at and after exercise.

Abs.CV.63

Effect of Exercise Intensity on Aerobic Fitness and Body Composition in Over-weight Medical Students

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Aerobic exercise is a good indicator of cardio-pulmonary and body fitness

Objective : To assess effect of intensity of physical exercise on body weight, body composition and maximum oxygen consumption (VO_2 max) in over-weight medical students.

Materials and Methods : The study comprised of randomly selected 120 medical students of GMC Amritsar (60 males, 60 females) aged 19-24 years, with BMI >23, divided into three groups i.e. Group-1: high intensity exercise-group (jogging for eight weeks, 15 minutes/day for 5 days/week), Group-2: moderate intensity exercise group (brisk walking for eight weeks, 30 minutes/day for five days/week), Group-3: controls). Eleven parameters viz. weight, height, waist & hip circumference, waist/hip ratio, skin-folds (triceps, biceps, sub-scapular & supra-iliac), maximum oxygen consumption (VO2 Max) and percent body-fat (%BF) were recorded. Aerobic fitness was assessed by Queen College step-test. Body composition was estimated by body-mass index, bioelectric impedance analyzer, skin-fold measurements and waist/hip circumferences.

Results : The results reveal highly significant (P<001) reduction in weight, body-fat while VO_2 Max increased in both exercise groups as compared to controls. The results were more pronounced in high intensity group.

Conclusions : High & moderate intensity aerobic exercises are effective in reducing body weight, percent body-fat and increment of VO_2 maximum in over-weight individuals. High intensity exercises are better than moderate intensity workout.

Abs.CV.64

Study of Heart Rate Qt and QTc Interval Response to Leg Press Exercise Test in Obese Young Adults

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Introduction : Obesity is abnormal or excessive fat accumulation and it represents a major risk factor for a number of cardiovascular diseases such as Hypertension, Cardiac arrhythmias and coronary heart diseases. It has been proposed as a risk factor for ventricular arrhythmias and sudden death. In India prevalence of obesity is increasing in children and adolescents as reflected in various studies.

Objective : The objective of this study was to assess Heart rate, QT and QTc intervals response to leg press exercise test in obese young adults.

Materials and Methods : It is a prospective study including 50 subjects, who were students of 1st MBBS of JSS medical college, aged between 18-21years. The group was

subdivided into study group comprising 25 students who are obese with BMI >25 kg/m^2, the remaining 25 are control with BMI 19–4.9 kg/m^2. Baseline ECG was recorded for 5 minutes in lead II using power lab multichannel polygraph instrument. Heart rate, Qt and QTc interval were calculated. Both the groups were asked to perform isometric exercise at 40% of their maximum voluntary contraction using leg dynamometer till the point of fatigue. Lead II ECG was taken immediately after exercise to calculate heart rate, Qt, and QTc interval.

Results : Statistical analysis was done using independent T-test. Before exercise, there is significant prolongation of QT interval in study group when compared to control group. Heart rate, Qt, QTc interval response to leg press exercise test in both the groups is not statistically significant.

Conclusion : Obese adults with QT prolongation are at increased risk of cardiac arrhythmias. Therefore QT interval analysis is a non invasive tool to detect high risk subjects who should receive special medical attention.

Abs.CV.65

Physical Activity Induced Biochemical and Physiological Changes in Rat Model

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Objective : To assess haematological, histological, immunohistological and biochemical parameters after prolonged physical activity.

Method : Rats were made to swim for three hours at a stretch. Blood from orbital plexus was taken after light ether anaesthesia for determining lactic acid (Barker & Summerson Method, 1941) and acetylcholinesterase (AChE) (Ellman *et al*, 1961). The animals were sacrificed after thirty minutes by drawing blood and organs for assessment of routine hematological studies by standard procedure. Oxidative stress enzymes like SOD (Krishnan *et al*, 2002) and catalase (Hugo Aebi, 1984) were measured. The efflux transporter, P-glycoprotein, was detected with Millipore kit.

Results : It was observed that with increased period of physical stress, the rats showed decrease in their rectal temperature; increase in blood lactate level from 15.9±0.5 to 32.8±3.0 mg/100ml; decrease in fasting blood glucose level from 86.6±3.3 to 61.3±3.6 mg/dl; apparent increase in haemoglobin concentration from 13.5±1.3 to 15.6±0.99 gm% and increased total RBC count from 5.75±0.2 to 6.24±0.4 million cells per mm^3**.** The AChE activity of rats performing swimming exercise for 180 minutes was found to be 17 nM/min/mg Hb as compared to 13 nM/min/mg Hb. A gradual increase in the catalase activity in the brain of rats was observed after completion of exercise. The highest activity was 0.61±0.05 k compared to control (unexercised) value of 0.51±0.02 k. SOD activity in brain was also found to increase gradually, the highest activity being 0.71±0.06 unit/mg protein/min, as compared to the control value of 0.59±0.05 unit/mg protein/min. Similar trend was observed in the catalase activity in the liver of rats after exercise which was 3.12±0.067 k compared to the un-exercised value of

2.09±0.402 k. The SOD activity in the liver was increased to 2.12±0.93 unit/mg protein/ min from the control value of 1.71±0.6 unit/ mg protein/min. The liver showed oedema with widened intercanaliculi space and inflammation was observed too. The density of efflux transporters was observed to have increased by about 20%.

Conclusion : Intense physical activity induces adaptive changes in haematological, histological and biochemical parameters.

Abs.EN.01

Platelet Aggregability and Fibrinolytic Activity in Various Phases of Menstrual Cycle in Healthy Young Women

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Objective : The coordinated sequence of hormonal changes during the various phases of normal menstrual cycle are well characterized, whether parallel changes occur in prothrombotic tendency and fibrinolytic activity in healthy menstruating women, is the objective of this study

Method : This cross sectional study on 50 healthy normal menstruating females in age group of 18-35 yrs presents variations and comparison in platelet aggregability and fibrinolytic activity during menstrual (1-5 days), follicular (9-12 days) and luteal (20-25 days) phases of menstrual cycle. Platelet aggregability was measured by ADP induced platelet aggregation on a spectrophotometer. Fibrinolytic activity was estimated by euglobulin clot lysis time.

Results : Results were analyzed by students paired 't' test. Change in platelet aggregability was 0.12±0.15, 0.04±0.04 and 0.08±0.07 in menstrual, follicular and luteal phases respectively. Platelet aggregability was significantly ($P<0.001$) higher in menstrual and luteal phases than follicular phase. The mean euglobulin clot lysis time was 277.6±43.96, 147.6±52.78 and 244.6±59.12 in menstrual, follicular and luteal phases respectively. Fibrinolytic activity was significantly ($P<0.0001$) lower in menstrual and luteal phases than follicular phase.

Conclusion : These cyclical changes in platelet aggregability and fibrinolytic activity suggest that there is prothrombotic tendency and low fibrinolytic activity during menstrual and luteal phases which coincides with lower levels of estrogen. This study helps us in predicting coronary heart disease risk in healthy young women during menstrual and luteal phases, in presence of predisposing factors like hypertension, diabetes, smoking etc.

Abs.EN.02

Study of Sympathetic Functional Status in Different Phases of Menstrual Cycle in Healthy Females.

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Objective : To observed the sympathetic functional status during early follicular and late luteal phases of menstrual cycle.