

Abs.PT.01

Effect of Aloe Vera (Aloe Barbadensis) Gel Extract on Re-polarization State of Myocardium in Albino Rat

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Objective : Aloe vera is a well known medicinal plant contents with over 75 different ingredients, anthraquinones, saponins, and sterols. Recent studies showed that it is a potent hypolipidemic, hypoglycemic and antioxidant. In present study we investigated the dose dependent effect of aloe vera gel on repolarization state of myocardium, heart rate, QRS complex and QT interval using electrocardiograph in albino rats.

Method : A total of 24 male albino rats were divided into four groups, one control and three experimental. An aqueous solution of Aloe barbadensis was prepared by taking fresh leaf of aloe plant. Animals of all the groups were anesthetized and were treated (i.p.) with aloe vera gel extract in doses of 100, 200 and 300 mg/kg body weight in experimental groups I, II and III, respectively. Electrocardiograms were recorded at 0 (basal), 15 and 30 min after injection of aloe vera/ saline.

Results : Aloe vera in doses of 200 mg increases QTc from 73.10±3.25 (mv) to 75.04±1.93 (mv) and in 300 mg, QTc increased from 72.10±1.85 to 76.10±1.56

which is statistically significant (P<0.05).

Conclusion : Higher doses of aloe vera cause prolongation of QTc interval in albino rat. Therefore administration of aloe vera in higher doses may be cardio toxic.

Abs.RS.01

Effect of Obesity on Flow Volume Curves of Young individuals with Obstructive Pulmonary Disease

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Objective : To study the effect of obesity on the Flow Volume Curves of young individuals with obstructive pulmonary disease.

Method : This is a retrospective cross sectional study in which the data was collected from the Department of Pulmonary Medicine, JSS hospital, Mysore. The study comprised of 90 subjects in the age group of 20-40 years who were normotensive and non diabetic. They were divided into three groups as follows :

Group A : Normal weight patients (BMI < 22.9 kg/m²) without obstructive findings.

Group B : Normal weight patients (BMI < 22.9 kg/m²) with obstructive findings.

Group C : Obese patients (BMI > 25 kg/m²) with obstructive findings.

Flow Volume loop, FEV1 and FVC were recorded using computerised spirometer and FEV1/FVC was calculated. Normal values of

FVC and FEV1 indicates normal PFT. Low values of FVC and/or FEV1 indicates the presence of disease (obstruction/restriction). When the measured value of FEV1/FVC was 69% or less than the predicted value, it indicates the presence of obstruction. Statistical analysis was done by one way ANOVA test using SPSS version – 16.

Results : The measured FEV1/FVC % in Group C was significantly lower than Group B ($P < 0.05$). Group B also showed significantly lower measured FEV1/FVC % than Group A ($P < 0.05$).

Conclusion : This study shows that obese individuals have more obstruction when compared to normal individuals with symptoms. This observation is of importance because the changes in respiratory mechanics due to obesity are almost completely reversible. Hence early intervention in obese patients with COPD will ensure lower dependence on medicines to manage the respiratory condition.

Abs.RS.02

Effects of Ergoreflex on Heart Rate and Other Efferent Effects in Adult Male Patients With Chronic Obstructive Pulmonary Disease

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Objective : In COPD, overactivation of ergoreceptors may be a link between peripheral changes, sympathetic overactivation and

increased hemodynamic and ventilatory responses to exercise. The current study was undertaken to

- (1) To demonstrate the hyperactivity of ergoreflex in patients of Chronic obstructive pulmonary disease.
- (2) To record other efferent effects.

Method : Twenty stable COPD male patients aged 57 ± 0.5 years and twenty healthy male subjects aged 50 ± 0.6 years were studied under experimental and control groups. The ergoreflex contribution to cardiorespiratory parameters was assessed by post-handgrip regional circulatory occlusion method (PH-RCO) and computed as the difference in heart rate and respiratory rate response between PH-RCO and control run without PH-RCO.

Results : Results were analysed for significance of variance between two groups by repeated measures Anova. COPD patients showed overactivation of ergoreflex as compared to control subjects in terms of heart rate during sustained hand grip (SHG) exercise (117 ± 1.22 versus 89 ± 0.89) beats/min, recovery heart rate ($P < 0.001$), respiratory rate during SHG (24 ± 0.54 versus 19 ± 0.24) breaths/min and recovery respiratory rate ($P < 0.001$). Degree of overactivation of ergoreflex was significant in COPD patients ($P < 0.001$).

Conclusion : In COPD, overactivity of ergoreflex is associated with abnormal cardiorespiratory reflex control. COPD patients showed overactivation of sympathetic nervous system as evidenced by heart rate changes during exercise and delayed recovery.

Keywords : ergoreflex, sustained hand grip (SHG) exercise, COPD, sympathovagal balance

Abs.RS.03

A Study of Pulmonary Functions and Lipid Peroxidation Biomarker in COPD : Correlation Between Malondialdehyde and Lung Functions

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“COPD is a diseased state which is characterized by airflow limitation that is not found to be fully reversible”. Oxidant – Antioxidant imbalance is implicated in Pathophysiology. Lungs are exposed to high levels of Free Radicals, which if unchecked cause direct lung injury, or induce a variety of Cellular Responses, through the generation of secondary Metabolic Reactive Species. Membrane Lipids are highly susceptible to Free Radical damage. Malondialdehyde is a product of Lipid Peroxidation and an indirect measure of Free Radical activity in body. As free radical injury increases lung functions show decline. The aim of the present study is to evaluate the MDA levels (Philpot method) in healthy non smoker controls and COPD groups and correlate it with LUNG FUNCTION (evaluated by COMPUTERIZED SPIROMETRY).

Results : A total of 60 control and 60 COPD patients were studied. Lung functions namely FEV₁, FVC, FEV₁/FVC% and FEV₁% PREDICTED showed significant reduction in COPD groups as compared to healthy non smoker controls. MDA in Control and COPD group (1.09±0.09 and 1.41±0.23 nmol/ml respectively) showed significant changes

(P<0.001). There is significant negative correlations of MDA with FEV₁% PREDICTED (r=-0.828, P sig at <0.001), FEV₁ (r=-0.775, P sig at <0.001), FVC (r=-0.625, P sig at <0.001), FEV₁/FVC% (r=-0.761, P sig at <0.001). On the basis of study it is concluded that there is inverse correlation between MDA and Lung functions.

Abs.RS.04

Evaluation of Pulmonary Function Tests in Patients Undergoing Laparotomy

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Objective :

1. To compare and evaluate preoperative and postoperative values of pulmonary function parameters.
2. To study the effect of gender difference, site of surgery and body mass index on postoperative pulmonary function parameters.
3. To identify patients with high risk of developing postoperative pulmonary complications.

Method : Pulmonary Function Parameters were recorded preoperatively one day prior to surgery and postoperatively on 5th day. PFT were recorded using RMS Helios spirometer and all the tests are conducted according to ATS/ERS guidelines.

Parameters recorded : TV, ERV, IRV, IC, VC, MVV, FVC, FEV₁, FEV₁/FVC, PEF_R, PIF_R.

Statistical analysis were carried out by using paired t test.

Results : We found statistically significant decrease in all the pulmonary function parameters in postoperative period except that of FEV₁/FVC. When we did intergroup statistical analysis, we found more decrease in PFT parameters in Male patients, Patients undergoing Upper abdominal surgery and in Obese patients.

Conclusion : Thus after laparotomy there are *restrictive type* of ventilatory changes due to pain, altered pattern of ventilation and diaphragmatic weakness.

Male patients, patients undergoing upper abdominal surgeries & obese patients are *high risk patients* for pulmonary complications.

Since these postoperative pulmonary changes can be easily diagnosed by spirometer, all patients undergoing laparotomy should undergo preoperative and postoperative spirometry.

Also prophylactic preoperative physiotherapy and postoperative deep breathing exercises, incentive spirometry and chest physiotherapy can be beneficial in patients of laparotomy.

Abs.RS.05

Peak Oxygen Uptake (Peak VO₂) as a Marker of Disease Severity in Chronic Obstructive Pulmonary Disease

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Objective : Chronic Obstructive pulmonary disease (COPD) is a slowly progressive disorder characterized by airflow obstruction that is not fully reversible. The forced expiratory volume in one second (FEV₁) – is often used to grade the severity of COPD. Various recent studies have provided evidence that COPD is often associated with significant extrapulmonary abnormalities, the so-called “systemic effects of COPD”. However, patients with COPD have systemic manifestations that are not reflected by the FEV₁. Therefore it is of interest to investigate parameters other than FEV₁ to predict disease severity in COPD.

Method : Fifteen patients of COPD with varying severity (Mild=3, Moderate=5, Severe=7) served as subjects. Clinical diagnosis of COPD confirmed by history, physical examination, abnormal spirometry and chest roentgenogram. Study was conducted in the department of physiology, AIIMS. Cardiopulmonary exercise test by bicycle ergometer under the protocol 10 Watt ramp was used in the study. All patients gave informed consent as approved by the institute ethics committee.

Results : Pearson correlation was done and Peak VO₂ correlated significantly with the following parameters.

1. FEV₁ (P=0.0211), 2. FEV₁ predicted (P=0.0092), 3. VO₂ predicted (P=0.0129), 4. VO₂ % predicted (P<0.0001) 5. METS (P=0.0002), 6. METS % predicted (P<0.0001), 7. VE at VO₂ max (P=0.0001), 7. VE predicted (P=0.0241), 8. Exercise duration (P<0.0001).

Conclusion : The results of the present study indicate peak VO₂ can be used as a marker of disease severity in COPD.

Abs.RS.06

Effectiveness of Pulmonary Rehabilitation on Quality of Life in Chronic Obstructive Pulmonary Disease Patients

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Objective : To study the effectiveness of pulmonary rehabilitation on quality of life in chronic obstructive pulmonary disease patients.

Method : Thirty stable COPD patients of ≥ 35 years of age were enrolled in this programme from Lok Nayak Hospital for a period of 6 weeks. The diagnosis of COPD was made according to the standards of American Thoracic Society, forced expiratory volume in one second (FEV1)/forced vital capacity (FVC) $<70\%$ and FEV1 $<80\%$ of predicted value. Baseline levels of anthropometrical parameters (weight, BMI & mid arm circumference), 6-minute walk test, hand grip dynamometer endurance time, sub-maximal cycle ergometer test, PFT, ABG and Health Related Quality of Life index (H.R.Q.L.) based on Seattle Obstructive Lung Disease Questionnaire were recorded. All patients were advised respiratory muscle stretching exercises (pulmonary rehabilitation) of one hour long duration twice a week for 6 weeks after which levels of all the parameters were re-evaluated. Data collected was analyzed with statistical software package SPSS using student's paired two-tailed t test comparing each subject before and after pulmonary rehabilitation with $P < 0.05$ taken as statistically significant.

Results : The 6-minute walk test (238.00 ± 70.04

mts), HRQL index (109.70 ± 6.51) showed significant improvement $P < 0.05$ (257.97 ± 70.00 mts and 116.90 ± 8.38 respectively) after pulmonary rehabilitation.

Conclusion : There were significant improvements in terms of various exercise and health related quality of life parameters after pulmonary rehabilitation of 6 weeks duration.

Abs.RS.07

Study of Spirometric Parameters of Chronic Obstructive Pulmonary Disease Patient

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Objective : 1. To study pulmonary functions tests in patients with COPD. 2. To study the severity of disease in patients with COPD. 3. To evaluate respiratory abnormalities in Smoker and Nonsmoker by spirometry. 4. To evaluate spirometric abnormalities in patients with COPD in relation to Occupation and Residence. 5. To correlate symptoms and pulmonary functions. To detect obstructive lung diseases and restrictive lung diseases by spirometry.

Method : This is an observational clinical case study of 50 cases with COPD carried out at G. G. Hospital, Jamnagar on outdoor or indoor basis with an aim to evaluate observation of spirometric parameters by SPIRO ANALYZER ST-90.

7Results : In present study FEV1/FVC ratio, FEV1% and FVC all are significantly decreased in smokers than in non-smokers suggesting smokers have statistically significant C.O.P.D changes.

Conclusion : Most of middle aged and old patients were smokers than young one and had severe COPD. Smoking habit was observed more in male. On comparing the data of physical parameters, mean age, height and weight of subjects it was found on lower side when compared with other studies. Spirometric results suggested severe COPD in smoker group than non-smoker confirming smoking was an important avoidable risk factor. Role of occupation where traced for exposure with smoke, dust and chemicals was inconclusive in my study. History of patients suggests that exacerbation of COPD were more frequent in winter months which are frequently associated with upper respiratory tract infection.

Abs.RS.08

The Effect of Exposure Duration on Pulmonary Functions in Street Cleaners

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Objective : Street cleaners are exposed to different types of dusts, bioaerosols and various gases. These have deleterious effect on lung functions. So we carried out this study to see the effect of these (dusts and bioaerosols) with increasing duration of exposure in occupationally exposed persons.

Method : The study group comprised of 110 street cleaners and 60 control subjects. The pulmonary functions of these were assessed using MIR Spiro lab II Spirometer.

Results : The study showed that there is no statistically significant decrease in Pulmonary functions in street cleaners working for less than five years, Street cleaners working for five to ten years of work showed statistically significant decrease in PEF, FEF25%-75% and FEF25% as compared to control subjects while Street cleaners working for more than ten years of work showed statistically highly significant decrease in PEF, FEF25%-75% as compared to control subjects.

Conclusion : With increasing duration of exposure the pulmonary functions keep on deteriorating in Street cleaners.

Abs.RS.09

Lung Functions Test in Road Workers : A Preliminary Study

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Objective : The Present Preliminary study was started with the aim to know the effect of road worker environment which consists of road dust, coal tar fumes during the repairing or new road development on lung function tests of the workers.

Method : We selected 50 male road workers of 20 to 50 years age group, from public works department (PWD), Bareilly who were

exposed to road dust, coal tar fumes during the repairing or new road development and 20 male security men and peons of the same age group from Rohilkhand Medical College & Hospital who were not exposed to the dust and fumes etc. In each workers age, height, weight and duration of exposure to dust and coal tar fumes were recorded. A preformed questionnaire was also delivered to them. The detailed clinical history and physical examination was done. Lung functions test was done with help of computerized spirometer. Forced vital capacity (FVC), Forced expiratory volume in first second (FEV1), Maximum voluntary ventilation (MVV), Peak expiratory flow rate (PEFR) were recorded in both groups.

Results : The values of FVC, FEV1, MVV, PEFR parameters were decreased in road workers (Study group) than security men and peons (Control group) but only decline in PEFR was found statistically significant. This decline may be because of dusty and fume environment during work.

Conclusion : Our study suggested to these workers should protect themselves by the use of clothes or they should be provided with masks to prevent dust exposure. Further work is needed to assess effect of smoking, age, duration of exposure among PWD road worker.

Abs.RS.10

Effect of Wood Dust on Respiratory Health Status of Carpenters By Estimation of Peak Expiratory Flow Rate

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Objective : The present study was conducted to establish the effect of wood dust on respiratory health of carpenters of age group 18–45 years by measuring the peak expiratory flow rates. Aim was to study the effect in respiratory health status of carpenters and compare them with age matched controls.

Method : the study consisted of 150 non-smoking carpenters while 150 controls were the non-smoking persons engaged in works other than carpentry. The influence of age, height, weight, BSA, duration of exposure on PEFR were observed. Peak expiratory flow rate was determined in cases and control and statistical analysis was done.

Results : The results showed that PEFR values was significantly decreased in carpenters as compared to controls. Mean PEFR of the study subjects (393 ± 52.14 Lpm) was found to be less than mean PEFR of the control subjects (485.53 ± 45.10 lpm) and the difference was found to be statistically highly significant.

Conclusion : The decrease of PEFR in carpenters is probably due to continuous exposure to wood dust which cause adverse effect on their respiratory status.

Abs.RS.11

For Free communication/Poster presentation

The Effect of Exposure Duration on Pulmonary Functions in Sewage Workers

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Objective : Sewage workers are exposed to various gases like methane, hydrogen sulfide, sulfur dioxide etc. and bioaerosol particles. These have deleterious effect on lung functions . So we carried out this study to see the effect of these in occupationally exposed persons.

Methods : The study group comprised of 62 Sewage workers and 60 control subjects. The pulmonary functions of these workers were assessed using MIR Spiro Lab II Spirometer.

Results : The study showed that Sewage workers working for less than five years of work showed statistically significant decrease in FEV1 (P value <0.03), FVC (P value <0.001) as compared to controls, Sewage workers working for five to ten years of work showed statistically significant decrease in FEV1 (P value <0.001), FVC (P value <0.001), PEFR (P value 0.001), FEF25%-75% (P value 0.05), FEF25% (P value 0.05) as compared to controls while Sewage workers working for more than ten years of work showed statistically significant decrease in FEV1 (P value <0.001), FVC (P value <0.001), PEFR (P value <0.001), FEF25%-75% (P value 0.03), FEF25% (P value 0.04) as compared to controls.

Conclusion : With increasing duration of exposure the pulmonary functions keep on deteriorating in Sewage workers.

Abs.RS.12

Effect of Cotton Dust Exposure on Pulmonary Function of Cotton Spinning Shop Workers

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Objective : Cotton dust exposure is common in textile industries; its exposure may induce acute or chronic respiratory problems. The objective of the study was to assess the effects of cotton dust on the lung function of small scale cotton spinning shop workers.

Method : The lung function was studied in fifty male cotton spinning shop workers with minimum exposure to cotton dust for 5 years and a similar number of male control subjects; all participants were non-smokers with the age range from 20 to 60 years. The subjects were matched for age, height, weight and socioeconomic status. The pulmonary function test was performed by using an electronic Spirometer (RMS-Medspiror) and results were compared by student's t-test.

Results : Significant reduction (P value <0.05) in the overall mean values of FVC, FEV1, PEFR, FEF25-75% and MVV were observed in cotton spinning shop workers relative to their matched controls. Changes in FEV1/FVC% were non significant.

Conclusion : Based on the results of the present study, we conclude that the small scale cotton spinning shop workers in Nagpur city, like textile workers elsewhere, are at an increased risk of developing occupationally related pulmonary function impairments. The results suggest that there is an urgent need to improve dust control measures and the health status of cotton spinning shop workers.

Abs.RS.13

A Study of Diffusing Capacity of Lung for

Carbon Monoxide and Pulmonary Function Test Among Petrol Pump Workers and Control Group

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Objective : The rapidly multiplying number of automobiles in most towns and cities and the corresponding increase in air pollution is of grave concern now a days. In this study we are trying to assess dynamic ventilatory lung functions of one such group the 'Petrol pump workers'. These workers were constantly exposed to exhaust fumes and fuel vapours throughout the day, this may result in accelerated decline of lung function.

Method : This was a cross sectional study, Thirty one petrol pump workers were assessed for diffusing capacity of lung for carbon monoxide {DLCO} and pulmonary functions {PFT}. Parameters were compared with age, sex and BMI matched thirty one controls not exposed to same environment. The above tests was recorded using MEDIGRAHICS U.S.A. BODY PLETHYSMOGRAPH. Data analysis was done By using MS Excel.

Results : A Significant decrease in DLCO parameters {DLCOunc, DL/VA} and PFT parameter {FEF 25-75%} were observed in petrol pump workers.

Conclusion : Thus by above study deteriorating lung functions can be detected at an early stage and further morbidity can be prevented. Exposure to air pollution in work environment should be monitored and

controlled by adequate engineering techniques and complemented by effective personal protection by petrol pump workers.

Abs.RS.14

Study of Forced Vital Capacity in Auto rickshaw Drivers

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Objective : Professional drivers e.g. auto rickshaw drivers who spend a lot of time in the traffic are at higher risk to develop respiratory diseases. Present study is designed to evaluate important ventilatory lung functions i.e Forced Vital Capacity in auto rickshaw drivers of Pune city.

Method : The study group were 100 auto rickshaw drivers who had been driving auto rickshaws of open cabin type for more than 8 hr/day in Pune city. Out of 100 study subjects 33 were driving for the period of 3-5 years (Group Ia) and 67 were driving more than 5 years (Group Ib) A group of another 100 individuals who were normal citizens, not auto rickshaw drivers, working in offices etc. and minimally exposed to traffic pollution was also selected as a control group. Forced vital capacity (FVC) was recorded of all the subjects on the automated flow Spirometer.

Results : The FVC of the subjects in Group Ib when compared with the Control group showed very highly significant reduction ($P < 0.001$) suggestive of a restrictive type of lung function impairment.

Conclusion : Vehicular fuel exhaust pollution as a whole namely PM, SO₂, NO₂, O₃ etc. act in tandem and cause structural damage to the lung there by causing reduced compliance and various other tissue changes leading to a restrictive pattern of pulmonary dysfunction.

Abs.RS.15

Prevalence and Incidence of Byssinosis in Ginning Mill Factory Workers

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Objective : “Occupational exposure to cotton flax & hemp dust, leads to a disabling lung disease known as, Byssinosis has been shown develop in response to dust exposure in cotton processing. It is especially prevalent among cotton workers in the initial very dusty operations where flakes are broken open. Byssinosis is characterized by shortness of breath & chest tightness. In Northern part of Karnataka, there are many Ginning factories associated with processing of cotton. The present study therefore was undertaken to evaluate the incidence & prevalence of byssinosis among such workers to assess magnitude of the problem.”

Method : The study is conducted on 110 workers of a ginning factory situated in Bijapur, District North Karnataka. 50 control subjects were selected from non-teaching staff BLDEA’S Sri B M Patil medical college Bijapur. The study subjects were divided in to Group-I (67 who actually work with cotton &

directly exposed to cotton dust).

Group-II (43 workers who are not directly exposed to cotton dust but working in other departments of mill).

Assessment of workers suffering from byssinosis done for Group-I & II, by using questionnaires designed by Murlidhar based on Schillong’s recommendations for diagnosis of byssinosis (recording) of occupational history was also taken. Statistical analysis was done by ‘Z’ test to calculate level of significance. ANOVA test was applied to compare the mean values of various groups.

Results : “In the present study, we observed that 8.95% of workers directly exposed to cotton dust suffered from byssinosis. Those in Group-II did not show any signs of byssinosis. The prevalence of byssinosis in the present study is very low. One of the important cause of this may be exposure period of the subjects to cotton dust. Depending upon duration of exposure the respiratory signs & symptoms are analysed. Depending upon the age group of the subjects chronic bronchitis (13), chronic cough (21), chronic phlegm (9). Grade wise analysis of byssinotic, shows that 6 are suffering from byssinosis, 4 suffering from Grade – I, 2 from Grade – II none of them suffered from either Grade – 1/2 or III of byssinosis.

Conclusion : The prevalence of byssinosis & other respiratory symptoms increased with increase in duration of exposure & advancement of age.

Abs.RS.16

Effect of Air Pollutants on Lung Functions

of Healthy Non-smoking Brick Kiln Workers in The Age Group of 18-35 Years

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Objective : The study was undertaken in order to know the effect of air pollutants on pulmonary functions of healthy non-smoking brick kiln workers in the age group of 18-35 years working in and around Patiala.

Methods : The present study comprised of 100 subjects out of which 50 were exposed to the direct emission from the furnace and 50 were unexposed. Lung function tests were done on MEDSPIROR.

Results : Brick kiln workers recorded a significant decline in various parameters like FVC, FEV1, and PEFr when compared with control and is probably due to emissions from the furnace of brick kiln.

Conclusion : In the present study, there is definite link found between lung function values of brick kiln workers exposed to emission from brick kiln.

Abs.RS.17

Study of Spirometry in Flour Mill Workers

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Objective : The study was designed to assess the effects of exposure to flour dust on Spiro

metric parameters in flourmill workers of Bhavnagar region (Gujarat).

Method : A Total of 35 flour mill workers were involved in study who worked in flour mill for more than 5 years without using any protective measures. And 35 control subjects matched for height, age, sex and area of resident were studied. Spirometric parameter was taken using computerized Spirometer in morning from 9 to 11:30 A.M. Result was compared using paired t test.

Results : Significant reduction in the overall mean values of FVC, FEV1, SVC and MVV were observed in flour mill worker relative to their matched controls.

Conclusion : Based on this present study, we conclude that flour mill workers in Bhavnagar, likewise grain workers any were in the world, are at increased risk of developing occupationally related pulmonary function impairments. The result suggest that there is an urgent need to improve dust control measure and to provide health education and protective measures to workers.

Abs.RS.18

A Comparative Study of PEFr in Roadside Shopkeepers and Medical Staff

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Objective : Number of vehicles are increasing day by day on the road and so the vehicular emission by them. This study has been done to measure the PEFr values of roadside

shopkeepers who are constantly exposed to vehicular emission throughout the day and to compare with that of the medical staff.

Method : The study was conducted on 20 roadside shopkeepers of Guwahati city and 20 subjects from medical staff was taken as control for comparison . Both the groups were age and height matched. All the subjects were non smokers and without any history of respiratory illness. Wright's Peak Flow meter was used for measuring PEFR. The study was carried out between 12 pm – 2 pm during the day. The values obtained were compared statistically using t test.

Results : The mean PEFR of roadside shopkeepers and medical staff was found to be 469 ± 55.90 and 506.5 ± 45.45 respectively and they were statistically significant ($P < 0.05$).

Conclusion : The PEFR values of roadside shopkeepers was found to be lower than that of the control group. The reduced PEFR in roadside shopkeepers may be due to constant exposure to vehicular emissions.

Abs.RS.19

Pulmonary Functions in Air Conditioner Users

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Objective : In the modern life style, use of air conditioner had become very common. However, air conditioning is also known to cause hazardous effect on health. The present

study was planned to assess the effect of air conditioners (AC) on pulmonary functions in young healthy non-smoker males.

Method : This study was cross sectional study 33 AC users [(mean age \pm S.D.) 34.12 ± 3.42 yrs,] were compared with 39 non AC user [n=69, (mean age \pm S.D.) 33.41 ± 4.11 yrs]. Pulmonary function test was done using MIR SPIROLAB II during the home visit. Statistical analysis was done by unpaired t test for lung function parameter. Chi square test was used for the comparison of respiratory symptoms.

Results : Result showed significant decrease in FVC, FEV1, FEV1%, PEFR, FEF25%, FEF25-75%, and MVV in AC user as compared to the non AC user. Frequency of respiratory symptoms was also higher in AC user.

Conclusion : The result is suggestive of predisposition of AC users towards respiratory disorders in form of mild airflow obstruction.

Abs.RS.20

A Comparative Analysis of Spirogram Between Trumpet Blower Smoker and Healthy Smoker and Non-smoker

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Objective : The present study was an attempt to measure and compare the Pulmonary Function Test (FEV1) by Spirogram between trumpet Blower Smoker and Healthy Smoker and Non-Smoker.

Method : 30 Healthy Smokers, 30 Healthy Non-Smokers and 30 Trumpet Blower Smokers, all between age group of 20-45 years had been included in the study. The FEV1 and Chest Expansion were measured and statistical analysis done between the three groups.

Results : It was found that FEV1 of Trumpet Blower Smokers were nearly same or even better than normal Healthy Non-Smokers. FEV1 of Healthy Smokers was the worst. It was also found that chest expansion of Trumpet Blower Smokers were better than Healthy Smokers and Non-Smokers.

Conclusion : Regular smoking is hazardous to life. The study shows that regular pulmonary exercise will definitely be helpful even in the case of habitual smoker. Details of the study will be presented during the time of paper presentation.

Abs.RS.21

Absolute Eosinophil Counts and Spirometric Lung Functions in Bronchial Asthma

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Objective : To perform Spirometric lung function tests and measure the Absolute Eosinophil counts of patients suffering from Bronchial Asthma.

Methods : This preliminary study was conducted in the Department of Physiology, RIMS. Thirty (30) Asthma patients with ages

ranging from 13 years up to 65 attending OPD and ward of Department of Tuberculosis & Respiratory Diseases, RIMS are included in the study. Ventilatory lung function was conducted (Pre and Post Med.) on a Computerised Spirometer (Helios 701). Absolute Eosinophil counts of all the patients were further done on the spot.

Results : Functional lung impairment was observed which was graded according to the Global Initiative for Asthma guidelines based on FEV1 % predicted. 52.3% of patients had mild Asthma (FEV1>80%), 28.5% of patients had moderate Asthma (60-80%) and 19% of patients had severe Asthma (FEV1 <60%). The Absolute Eosinophil count showed a mean value of 352.6 cells/mm³ which is above the normal value of 150-300 cells/mm³.

Conclusion : The above results show that there is a rise in airway obstruction as well as peripheral blood Eosinophil counts among asthma patients.

Abs.RS.22

The Study of Restrictive and Obstructive Pattern in Chronic Alcoholics

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Objective :

1. To find out the status of respiratory functions in chronic alcoholics.
2. To study the extent of deviations of pulmonary function in chronic alcoholics as compared to normal healthy age

matched control subjects by using computerised medspiror and.

3. To know whether chronic alcoholics reveal restrictive or obstructive lung disease or combination of both on the basis of result obtained.

Method : In the present study, pulmonary function tests were carried out with "Computerised medspiror", (Recorders and Medicare system, Chandigarh), which is a high performance pneumotachometer capable of giving accurate test results and excellent reproducibility. Since the co-operation from the subjects being an important factor, all the subjects were explained in detail the procedure of lung function tests along with demonstration prior to the recordings. Proper trials were given to ensure that the subjects understand and are confident about the whole procedure in a cordial atmosphere. In the beginning the following data was fed to the instrument : Age, Sex, Room temperature, Standing height (cms), Weight (kg). With the help of this data predicted values of respiratory parameters were calculated and corrected to BTPS (body temperature and pressure) by the instrument itself.

Following maneuvers were performed by each subject: 1. Force expiratory maneuver, and 2. Maximum voluntary ventilation maneuver.

Three recordings were taken and the best of these was taken for calculations.

Results : The results and calculations were carefully subjected to standard statistical test for statistical significance. The results showed a significant decrease in FVC, FEV1/FVC%, PEFR and MVV in chronic alcoholics

as compared to control groups ($P < 0.05$).

Conclusion : In conclusion, the present study reveals that chronic alcoholism is dangerous as it impairs the lung functions with the manifestations of air way obstruction and restriction, as evident from the determination of pulmonary function tests.

Abs.RS.23

Effect of Oral Contraceptive on Timing And Depth of Respiration at Rest

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Objective : Hyperventilation and increase in oxygen consumption during the luteal phase of menstrual cycle are reported. Probably progesterone plays a key role. In view of the possibility that the use of oral contraceptive having progestational activity stimulates conditions similar to those occurring in luteal phase of menstrual cycle, the present study of timing and depth of breathing, the component of minute volume, was undertaken after the use of oral contraceptives.

Method : Fifteen married volunteers, of mean age 27 yrs, participated. They had never used any hormonal contraceptive earlier to this study. The experiment was conducted on both, normal menstrual cycle and cycle treated with oral contraceptives. The respiratory timings, volumes and flows were recorded at resting conditions during all three phases of

menstrual cycle, by using closed circuit apparatus, Expirograph (Godart, Holland). The differences in paired values were used for determining statistical significance by Fisher test. The alpha error for a significant test was set at 5% level.

Results : Hyperventilation (VE) was noted during the luteal phase compared to menstrual and follicular phases. This rise was due to tidal volume (VT), but not respiratory frequency (f). Increase in ventilation was more marked after use of oral contraceptives. Duty cycle, as indicated by TI/TTOT, remain unchanged. However, mean inspiratory flow (VT/TI) was significantly increased during luteal phase.

Conclusion : Luteal phase of menstrual cycle by virtue of its increased progesterone concentration and oral contraceptive having progestational activity augment ventilation at rest.

Abs.RS.24

Traditional Aerobic Exercise Versus Sprint Interval Training With Respect to Pulmonary Function Tests in Young Sedentary Males : A Randomized Controlled Trial

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Objective : To compare the effect of traditional aerobic exercise (AE) and sprint interval

training (SIT) on Forced vital capacity (FVC) and maximum voluntary ventilation (MVV) in young sedentary males.

Methods : Study design : Randomized Controlled Trial. Study was designed to test the null hypothesis by comparing the means with α as 0.05 and power of study as 80%. Sample size : 6 subjects per group (nQuery Advisor 7.0.) 14 male subjects aged 18 -23 years having sedentary lifestyle and no history of any major disease and smoking enrolled for the study voluntarily. Subjects were randomly allocated by computerized method.

Group I : AE : Subjects ran at low intensity like jogging for 45 minutes a day for 5 days a week.

Group II : SIT : Subjects ran 10 minutes a day, 3 days a week. Exercise was split into 4 sessions of 2½ minutes. Subjects ran at maximum intensity for 1½ minute and slow walking for 1 minute.

FVC and MVV were measured using Medgraphics U.S.A. Body Plethysmograph, Elite Dx Model NO-830001-005; before and after 3 week intervention period.

Results : Both Group I & Group II showed statistically significant ($P < 0.05$) increase in FVC & MVV (in litres) from 3.37 ± 0.26 to 3.68 ± 0.26 ; 151.16 ± 17.75 to 172.66 and 3.36 ± 0.33 to 3.83 ± 0.34 ; 140.66 to 168.33 respectively.

Conclusion : Both SIT and AE showed significant improvement in FVC and MVV after 3 weeks. SIT requires 30 minutes per week compared to 225 minutes per week for

AE. Thus, in current scenario of busy routines, SIT can act as a better alternative to AE.

Abs.RS.25

Pulmonary and Autonomic Functions in Athletes and Individuals With Sedentary Life Style – A Preliminary Study

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Objective : The purpose of present study was to evaluate the effect of athletic and sedentary life styles on pulmonary and autonomic functions.

Method : The study was conducted on 85 healthy male subjects. The Athlete group comprised of 57 defence force personals (mean age 23.035 ± 1.085 , height $169.211 \text{ cms} \pm 4.43$, weight $59.14 \text{ kgs} \pm 4.40$) who run 05 kms per day six days in a week since last six months. The Control group (Sedentary) comprised of 28 MBBS students (mean age 21.21 ± 2.09 , height $170.50 \text{ cms} \pm 5.76$, weight $64.32 \text{ kgs} \pm 7.60$) with no or minimal physical activity. Subjects were screened and a detailed medical history was taken to exclude any morbid state which can influence autonomic and pulmonary responses. Pulmonary functions were measured with a computerized Medspiror. Blood Pressure was measured with a digital BP instrument. Autonomic activity was assessed by performing HRV in supine position for five minutes with a eight channels Polyrite in Frequency domain method (VLF, LF, HF, LF/HF). Independent sample t-test were done to analyze the obtained data and

p-value was calculated at 5% significance level.

Results : In the athlete group the mean weight is found low and $P < 0.05$. FVC in the athletes is $3.59 \text{ L} \pm 0.45$ and in control $3.35 \text{ L} \pm 0.64$ and P-value is 0.056. P-value for FEV.5 ($P=0.01$), FEV1 ($P=0.00$), FEV3 ($P=0.048$), PEFR ($P=0.00$), FEV1/FVC ($P=0.05$) are found significant. In athletes, Heart Rate is found low (67.8 bpm) whereas in control HR is 75.85 bpm. BP is also low in athletes (mean 116.80/71.15 mmHg). HRV is found significantly high in athletes.

Conclusion : Exercise is a good approach to improve health related quality of life and reduces cardiovascular and pulmonary risk factors.

Abs.RS.26

Pulmonary Function in Synchronized Girl Swimmers : 1-Year Follow-up Study

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Objective : Pulmonary function is particularly important in synchronized swimming, considering the characteristics of this sport. However, the sanitizing agents (chlorine) used in pools can have a possible negative influence on the pulmonary function parameters. In this study, we measured pulmonary functions of 26 female swimmers.

Method : Female synchronized swimmers between the age group of 14 to 16 years and whose duration of training was more than 3

years were selected. Pulmonary function was measured before and after a 1-year period and included forced vital capacity (FVC), forced expiratory volume in one second (FEV1), forced expiratory flow in 25 to 75% of FVC (FEF25-75%) and peak expiratory flow rate (PEFR).

Results : The t-test showed significant increases in body height and weight of the participants and a resulting increase in most of the absolute respiratory flows and pulmonary capacities. Forced vital capacity (FVC) and forced expiratory volume (both in proportion to norm for body height and age) increased significantly within the study period. FVC significantly predicted the competitive achievement of young swimmers, most probably because swimmers have to achieve exceptional breath control when upside down underwater.

Conclusion : We found no evidence for the eventual negative influence of chlorine and its compounds on the pulmonary function of swimmers. This may be due to less duration of exposure of swimmers to chlorine. Results showed that regular synchronized swim training could improve the pulmonary functions of young swimmers.

Abs.RS.27

Effect of Posture on Pefr and Vital Index in Male and Female Volunteers

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Objective : The present investigation was designed to examine the effects of postural change on PEFR in Head up-900, supine and Head down-900 position in relation with Vital Index (VI) in normal male and female volunteers. Vital Index is a better parameter for comparison between persons of same age group and sex.

Method : 52 male and 48 female healthy volunteers between the ages of 19-25 years of GSL Medical College & Hospital, Rajahmundry were the subjects. Peak Expiratory Flow Rate was measured with a Peak Flow Meter made in ENNIS Ireland. We used a manually operable tilt table with a foot board for Head up 900 and Head down 900 positions. Height and weight were measured to calculate Body Surface Area by DuBois equation $BSA (m^2) = (Height) 0.725 \times (weight) 0.425 \times 0.007184$.

Vital Capacity was measured with a student spirometer in standing position in which Vital Capacity will be maximum.

Vital Index (VI) = Vital Capacity(ml)/Body Surface Area (m²).

Results : The mean PEFR value decreased from Head up 900 position to supine and Head down 900 position. There is a positive relation between Height and weight with Vital Index. There is a positive relation between Vital Index and PEFR in Head up-900, supine and Head down 900 positions.

Conclusion : Body position have an effect on

PEFR in subjects with normal Respiratory Function. Higher Body Surface Area and Vital Index values shows a positive relation with PEFR in Head up 900, Supine and Head down 900 positions.

Abs.RS.28

Peak Expiratory Flow Rate in Normal Healthy Students of Vikhe Patil Medical College Ahmednagar

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Objective : 1. To determine the PEFR in healthy medical students of this college (both male and female). 2. To find out the correlation between PEFR and different anthropometric parameters.

Method : PEFR was determined using Wright's mini peak flow meter. The anthropometric parameters which were considered were Height, Weight, BSA, BMI, Arm Circumference, H/W ratio.

Results : 1. The PEFR values which we obtained were comparable with those obtained in other studies. 2. On statistical analysis using correlation coefficient of the results we found a highly significant correlation of PEFR significant correlation of PEFR with all parameters.

Conclusion : This study was carried out in normal subjects and the results obtained are comparable to those obtained by other workers.

Abs.RS.29

Long Duration of Swimming has a Prolonged Effect on Airway Caliber than Muscle Effect

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Objective : Swimming is an organized, fast growing sport and is considered to be a healthy leisure activity for both young and the old. This exercise has a greater impact on lung functions than any other sport. There is a considerable ventilatory strain during swimming and this increases the conditioning of the accessory muscles of the neck and the chest wall Thus increasing the maximal static pressure, augmenting the swimmers ability to inflate and deflate the lungs. Therefore, comparison of lung functions in healthy male swimmers and non-swimmers in the age group of 20-40 years was performed in this study.

Method : In the present study pulmonary function tests was evaluated and compared between healthy male regular swimmers of 20-04 yrs of age matched controls.

Results : Pulmonary function tests like VC, FVC, FEV1, PEFR, MEF25, MEF50, MEF25/75 between the two groups showed positive highly significant differences ($P < 0.001$). Correlation of PFT variables with anthropometric measurements among controls showed a significantly negative correlation of MEF50 with BMI, among swimmers showed significantly positive correlation with vital capacity with

that of weight. Thus swimmers demonstrated a significantly positive correlation of VC with weight and PEFr with weight. MEF25 and MEF25/75 also correlated significantly with total duration of swimming practice. Univariate analysis of age and group interaction showed that swimmers were significantly younger when compared to controls.

Conclusion : The present study showed that the PFT variables like VC, FVC and PEFr are generally attributed to respiratory muscle efficiency whereas MEF, FEV1 is attributed to the large and small airway calibre respectively. Therefore the present study has indicated that airway calibre has a prolonged effect due to swimming practice. Hence, regular practice of swimming for longer duration could be recommended as an adjunct for airway disorders.

Abs.RS.30

Correlation of Body Mass Index With Pulmonary Function Parameters in Young, Non-Obese Volunteers

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Objective : To assess the impact of BMI on pulmonary function parameters in young, non-obese volunteers.

Method : The present study was conducted on 101 healthy, non-obese volunteers of

both genders. After obtaining informed written consent, their height and weight were measured by using weighing scale and stadiometer. Pulmonary function parameters such as FVC, FEV1, FEV1/FVC, FEF25-75, PEFr, and MVV were measured using computerised spirometer (Microlab Version 1.32). Respiratory pressures (MEP and MIP) were measured using aneroid meter.

Results : The average BMI of the volunteers was 20.19±2.40. Mean age was 20.12±3.32 years. FEV1 (P<0.001), FVC (P>0.05), PEFr (P<0.05), MVV (P<0.001), MEP (P<0.001) and MIP (P<0.001) were positively correlated with BMI. On the other hand FEF25-75 (P<0.001), FEV1/FVC (P<0.001) were negatively correlated with BMI.

Conclusion : Our data suggests that the commonly measured pulmonary function parameters have significant correlation with BMI of non-obese, healthy volunteers.

Abs.RS.31

Dynamic Lung Functions in Underweight Gujarati Indian Adolescents

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Objective : The objective of the study was to study the association of underweight on dynamic lung functions in Gujarati Indian adolescents. A cross sectional study was conducted on 85 Gujarati Indian adolescents boys of 17-21 years age group.

Method : The nutritional status of the participants was assessed by measuring BMI and they were grouped into normal weight and underweight boys. Total body fat % and fat mass were measured by Omron Body Fat Monitor HBF-302. Dynamic lung functions (FEV1, FEV6, FEV1/FEV6 and PEF) were recorded, using Piko-6 and Wright's Peak flow meter.

Results : FEV1 ($P < 0.01$), FEV6 ($P < 0.01$) and PEF ($P < 0.01$) were found to be significantly lower in the underweight boys in comparison to the normal weight boys. BMI showed a significant positive correlation with dynamic lung functions. Amongst underweight boys body mass index and fat mass index were directly associated with dynamic lung functions.

Conclusion : It may be concluded that nutritional status plays a major role in dynamic lung functions in Gujarati Indian adolescents.

Abs.RS.32

Diurnal Variation of Peak Expiratory Flow Rate Among Healthy Adults of 18-23 Years

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Objective : Peak expiratory flow (PEF) rate reflects the strength and condition of respiratory muscles and the degree of airflow limitation in large airways. Monitoring of PEF can be useful in assessing the degree of circadian variation in lung function and it can

be correlated with bronchial hyper-reactivity. Though variability in airway function has been observed in healthy individuals, reports regarding the pattern of PEF vary. This study was conducted to determine whether diurnal variation followed different pattern among males and females and if this variation could be used to predict subjects who are more prone for asthma.

Method : PEF was recorded in 100 healthy, students (50 males and 50 females) aged 18-23 (mean 18.8 ± 1.9 years). Daily PEF was recorded 5 times a day (7-8 am, 10-11 am, 1-2 pm, 4-5 pm and 7-8 pm), nose clipped, for 2 consecutive days in standing posture. Three readings were taken for each time point and best reading was noted. Diurnal variation was expressed in terms of A%M and SD%M.

Results : In males (36%) the PEF was low in the morning followed by an increase in the afternoon with a peak at 4-5 pm and a significant decrease at 7-8 pm. Female subjects (48%) also had a low PEF in the morning with a peak rise at 1-2 pm followed by a decline at 7-8 pm. The A%M and SD%M used to express diurnal variation were not significantly different in both sexes.

Conclusion : Therefore, this study shows a difference in pattern of PEF in males and females and this variation in pattern could be useful in identifying subjects who are predisposed to asthma.

Abs.RS.33

A Study of Lung Function Test Among Practitioners of Aerobic, Anaerobic Exercises And People With Sedentary Lifestyles

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Objective : Exercises have been shown to enhance the efficiency of the various organ system. Various forms of exercises are practiced by people for fitness. The present study was conducted to determine if aerobic and anaerobic exercises are associated with better lung function as compared to people with sedentary lifestyles and whether there is a difference between the lung function test of aerobic and anaerobic exercise practitioners.

Method : Spirometric parameters PEFr, FVC, FEV1 were assessed in randomly selected 36 healthy male subjects (12 practising aerobic exercises, 12 doing anaerobic exercises and 12 not performing any exercise) between the age group of 20–40 years (done to remove the confounding factor of impact of aging on lung function). Smokers and people with active respiratory disorders were excluded.

Results : Mean FVC is higher among aerobic exercise practitioners (5.41 ± 2.88) than that of the other two counterparts. Similar results with better FEV1 and PEFr were found among aerobic exercise practitioners than the anaerobic exercise and non practitioners.

Using the test of significance ANNOVA among the 3 groups it was found that there exists a significant difference in the mean FVC, FEV1, and PEFr levels between the 3 groups ($P < 0.05$, $P < 0.01$).

Conclusion : Aerobic exercise practitioners had better lung function than anaerobic practitioners and one with sedentary lifestyles.

Aerobic and anaerobic exercises could also be combined so that one can be a beneficial complement to the other in maintaining a balanced fitness. Thus pursuing exercises helps in achieving better lung function and exercise can be a important component of pulmonary rehabilitation for patients with chronic lung disease.

Abs.RS.34

Comparison of Static Pulmonary Function Test Before and After Acute Sub-maximal Exercise in Trained and Untrained Males

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Objective : The aim of study was to establish relationship between Static Pulmonary function tests before and after acute sub-maximal exercise on treadmill in Trained and Untrained males.

Method : The study was conducted on 66 young males (Trained –32, Untrained – 34) with mean age 19.3 ± 3.5 years from First year MBBS students in Tertiary Hospital. Spirometric recording were taken with Computerized Spirometric machine manufactured by MEDGRAFICS. Baseline recording were taken in both trained and untrained group followed by steady state sub-maximal exercise performed on motor driven Treadmill terminated at 75-80% HR_{max} . After the exercise, second reading was taken and compared with the baseline. Paired “t” test was used for analysis of comparison between Baseline & after acute sub-maximal exercise

on treadmill in both Trained & Untrained group. Unpaired "t" test was used to compare Trained Group with the Untrained Group.

Results : Vital Capacity (VC) (t test = 4.28), Inspiratory capacity (IC) (t-test = 4.04) in trained group were statistically highly significant at 5% level after acute Submaximal exercise as compared to Untrained group. But Expiratory reserve Volume (ERV) (t test = 1.019) was not statistically significant at 5% level i.e., $P > 0.05$.

Conclusion : These results indicate that regular aerobic training improves the Static lung functions parameters.

Abs.RS.35

Study of Muscle Strength and Pulmonary Function Tests in Sportsmen

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Exercise has been shown to have beneficial effect on fitness and performance in sports in human being. Lung function parameters tend to have relationship with lifestyle such as regular exercise. Handgrip strength in any sport is important in which hands are used for catching, throwing or lifting.

Objective : The study was planned (i) To determine muscular strength by handgrip dynamometer in sportsmen. (ii) To determine lung function tests in sportsmen. (iii) To compare muscular strength and lung function

tests in sportsmen with sedentary medical students (control).

Method : Muscular strength was measured by handgrip dynamometer (INCO INDIA LTD. AMBALA) in both groups. Lung function tests included FVC, FEV1 and MVV which were measured in both groups by RMS Helios spirometer 702. Results were analyzed by unpaired T test.

Results : Muscular strength was found to be more in sportsmen than sedentary medical students ($P < 0.0001$). FVC, FEV1, MVV were found to be more in sportsmen than control group ($P < 0.0001$).

Conclusion : Sportsmen are having more muscular strength than sedentary medical students. Lung function tests were also having higher values than control group. Medical students should be advised to do regular exercise to improve their physical fitness.

Abs.RS.36

A Study of Basal Lower Esophageal Sphincter Pressure in Patients of Bronchial Asthma

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Objective : The cause - effect relationship between bronchial asthma and gastroesophageal reflux (GER) is known, but the direction of this relationship is not established. There are very few studies that correlate hypotensive lower esophageal sphincter (LES) with lung function. This study was done to find

correlation between basal LES pressure and FEV1% predicted in adult patients of bronchial asthma. The objectives of the study were, firstly, to measure basal LES pressure in patients diagnosed with bronchial asthma and, secondly, to correlate the degree of reduction of basal LES pressure with FEV1% predicted in these patients.

Method : Thirty patients, aged between 20-65 years, diagnosed as cases of bronchial asthma were included in the study. All the patients were subjected to esophageal manometry after overnight fasting and basal LES pressures were recorded. Then, spirometry was done 2 hours after meal and pre- and post-bronchodilator FEV1, FVC, PEFr was obtained.

Results : Two-thirds of the patients had reduced LES pressures. The correlation coefficient between basal LES pressure and prebronchodilator FEV1% predicted, using Karl Pearson method, was 0.596. The pre medication values for all parameters correlated better with LES pressure as compared to post bronchodilator values. Using ROC curve analysis, the cut-off limit obtained for mild obstruction was 9.02 mm Hg of LES pressure.

Conclusion : The obstructive airway impairment in adult patients of bronchial asthma is associated with hypotensive LES. However, the direction of association and the link between the pathophysiology need to be established.

Abs.RS.37

Assessment of Pulmonary Functions in Obese Subjects

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Objective : Obesity is a worldwide problem and is a major risk factor of CHD, diabetes, hypertensive heart disease, hypercholesterolemia and certain types of cancers. Its cause is unknown but genetic factors and life style changes due to social, cultural, behavioral and metabolic factors are reported in its causation. Many researches showed reduced lung function in obese subjects as compared to age sex matched non-obese subjects with conflicting results. Therefore the present study was planned to observe the ventilatory functions in obese North Indian subjects to compare their lung functions with normal non-obese subjects.

Methods : One hundred nine subjects, including 67 non-obese and 42 obese participated in the present study and their pulmonary function test were evaluated by spirometer and anthropometric measurement including weight, height and body mass index. All the subjects in both groups were told about the test procedure and consent was obtained from all of them.

Result : The average weight and body mass index of obese people was 87.67 kg and 35.38 kg/m² respectively as compared to control ones (64.58 kg and 23.09 kg/m²). All the measured respiratory parameters viz. FVC, FEV1, MVV, PEFr and SVC were significantly lower (P<0.001) in obese people as compared to non-obese individual. However greater reduction in lung functions

was observed in younger age group as compared to older subjects.

Conclusion : The obesity has effects on lung functions reducing respiratory well being even in absence of specific respiratory disease. The possible mechanism may be mechanical limitation to chest expansion during Forced vital capacity (FVC) maneuver in obese subjects.

Abs.RS.38

Comparison of Diffusion Capacity of Lungs and Dynamic Lung Functions Among Athletes and Non Athletes

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Objective : (1) The present study was undertaken to assess the effect of regular training/sports activity on diffusion capacity & dynamic lung functions. (2) To compare DLCO & MVV & PEFR among athletes & non-athletes.

Method : Study was conducted on 66 males (33 trained & 33 untrained) with age group 17-26 yrs. diffusion capacity & lung functions were recorded on body plethysmograph model 830002-308.

Three readings of PEFR were recorded in standing position using portable peak flow meter. Cross sectional studies used to compare b/w two groups. Mean value of height & weight in athletes were 166.34 ± 7.10 cm & 55.80 ± 8.20 kgs whereas in non-athletes were 162.14 ± 7.12 cm & 52.71 ± 7.20 kgs. higher

mean values in athletes reflects higher growth pattern.

Results : DLCO & MVV & PEFR in athletes were more than that of non-athletes & statistically highly significant when compared to non-athletes.

Conclusion : Results indicates that regular training in the form of running/sports training may helps in developing reduced resistance to expiration & greater endurance in respiratory muscles thereby increasing diffusion capacity & dynamic lung functions.

Abs.RS.39

Prevalence of Obstructive Sleep Apnea Among IT Professionals

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Objective : To evaluate the prevalence of OSA among IT professionals.

Method : The study was conducted on male participants from a well known IT company at Chennai (age group 25–35 years, n=100). Subjects filled in a self explained validated online questionnaire (with Epworth score, Sleeping behavior, Life style, etc). Anthropometric measurements were taken both directly on the subjects and from the photographs of the subjects. Risk index and Apnea Hypopnea index (AHI) were measured using an overnight type IV polysomnography.

Results : Positive correlation of P,0.05 was observed between Epworth score and BMI, snoring pattern, neck circumference and thyromental angle. Epworth score >9 was observed in 27%. These subjects also reported of stopping of breathing during sleep (33%), discomfort during sleep (18%) and decrease in work efficiency (50%). Type IV polysomnography on these subjects showed that 37% of them had an Apnea-Hypopnea index greater than 10 (maximum AHI observed was 89).

Conclusion : This pilot study has shown a high risk among the IT professionals for the occurrence of sleep apnea. Their sedentary lifestyle and diet habits could have contributed for the observed results. Appropriate treatment regime could prevent sleep apnea and hence other co-morbid conditions.

Abs.RS.40

A Study of Serum Calcium Levels in Smokers and Non Smokers

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Objective : Smoking is a major health hazard with detrimental effect on many organ system including the skeleton. Cigarette smoking has been identified as a risk factor for low bone mineral density and osteoporotic fracture. The present study was conducted to determine the calcium level in the serum of cigarette smokers and to assess whether there is a correlation between the serum calcium and number of cigarettes smoked per day or to the duration of smoking.

Method : Study was carried out at guwahati city. Study group covered 20 male subjects with different ages who were smokers and 20 non smokers as controls. Age range of all volunteers in this study was between 21 and 50 years. The volunteers did not have any disease which affected the calcium level and were on a normal diet. Detection of serum calcium was done by automated analyzer.

Results : The mean serum calcium level among the non smokers is much higher than that of smokers. The mean of smokers was 8.74 ± 0.38 as compared to non smokers mean 11.8 ± 1.80 . Using t-test to see the significance of the difference it was found that there exists a significant difference in mean of serum calcium between smokers and non smokers ($P < 0.05$ and $P < 0.01$). But no correlation was found between the level of serum calcium in cigarette smokers and the number of cigarettes smoked per day and the duration of smoking in years.

Conclusion : Thus from the results we conclude that smoking has a negative impact on the serum calcium level. So, smoking can lead to not only respiratory diseases but also disorders of decreased serum calcium levels.

Abs.RS.41

Spirometric Lung Function and Sympathetic Nervous System in Bronchial Asthma

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Objective : Measurement of lung function by spirometry and testing sympathetic division of autonomic nervous system in asthma.

Method : This study was carried out in the Departments of Physiology and Respiratory Medicine, RIMS Imphal. 30 asthmatic patients and 20 healthy subjects (controls) were taken. Lung function was studied by computerized spirometer. Three consecutive spirometric recordings were performed and the best result among three (3) readings was taken. Sympathetic division of autonomic nervous system was tested by measuring blood pressure response to sustained hand grip for 2 minutes and to standing from supine posture for 3 minutes.

Results : Functional lung impairment was observed which was graded according to Global Initiative for Asthma guidelines based on FEV₁% of predicted. 52.3% of the patients had mild asthma (FEV₁>80% of the predicted) and 28.5% of patients had moderate asthma (FEV₁ between 60-80% of predicted) and 19.2% of patients had severe asthma with FEV₁<60% of predicted. Mean rise in diastolic blood pressure on sustained hand grip for 2 minutes was 15.6 mmHg in asthmatics whereas it was 12.5 mmHg in control subjects. Mean rise in diastolic blood pressure on standing from supine posture for 1 minute was 9.3 mm Hg in asthmatics with control subjects having mean rise of 6 mmHg.

Conclusion : Highest percentage of patients suffered from mild asthma accounting for 52.3% of patients. 28.5% of patients suffered from moderate asthma and 19.2% of patients suffered from severe asthma. Diastolic blood pressure rise on sustained hand grip and on standing from supine posture was greater in

asthmatic patients as compared to control subjects.

Abs.RS.42

Human Voice Based Instruction System For Respiratory Modulation at Varied Respiratory Frequencies

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Objective : Earlier we have developed the visual feedback based instruction system. Now the objective is to develop a human voice based instruction system for the respiratory modulation at targeted frequencies.

Method : The human voice was recorded as “breath in” and “breath out”. After recording this sound audio is compressed or stretched using audio editing software (Steinberg Nuendo 3.2.0.1128), keeping inspiration and expiration ratio of 1:1. Such voice instructions were made for each required respiratory frequency. Biopac MP150 was used to record the respiratory signals during breathing at various different rates. The instructions were given to the subjects using comfortable high quality headphones and this voice as signal was recorded in data acquisition system simultaneously using the “Y” connector. The recordings were done in eight subjects to see the repeatability and feasibility of the auditory instructions at 6, 10 and 15 BPM.

Results : It was observed that the respiratory rate was kept at target frequency using human voice based instruction system. It was also observed that the depth of breathing increases

with instructional breathing.

Conclusion : Human voice based instruction system for auditory instructions for the respiratory modulations is a feasible and easy method. This also gives scope to keep track on the instruction and followed respiration of subject.

Abs.RS.43

Effect of Thoracic Mobilization Exercises With Chest Physiotherapy in Post-operative Patients

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Objective : To determine the effectiveness of thoracic mobilization exercises with chest physiotherapy to improve lung expansion in post-operative patients.

Methodology : In this experimental study, 30 post-operative patients who underwent thoracic & upper abdominal surgery, age groups between 30-45 yrs of both gender were included to participate. Chest expansion in axillary, nipple & xiphisternal levels were measured by inch-tape on post-operative day 1. Thoracic Mobilization & Chest physiotherapy protocols were given from post-operative day 1 to 7. Chest expansion was

measured at above mentioned levels on post-operative day 7. Incentive spirometer: the patient was asked to take a sustained maximal inspiration (SMI). Chest expansion measured at various levels on post-operative days 1 & 7 were compared, and spirometric values were also compared on post-operative days 1 & 7 by using paired 't' test.

Result : The chest expansion increased from mean values of 1.5 to 2.5 cm, 2.03 to 2.9 cm & 1.6 to 5.5 cm (P<0.001) in axillary, nipple and xiphisternal levels respectively, and incentive spirometric values increased from 2230 ml to 2998.33 ml (P<0.001). The results showed effectiveness of thoracic mobilization exercises with chest physiotherapy in post-operative patients.

Conclusion : Pulmonary complications are leading cause of post-operative morbidity and mortality in patients who have undergone thoracic & upper abdominal surgery under general anaesthesia. For many investigators, thoracic mobilization exercises & chest physiotherapy represents an efficient method to prevent atelectasis. Thoracic mobilization exercises & chest physiotherapy are group of treatment which improves respiratory efficiency, promotes lung expansion, strengthen respiratory muscles and eliminate secretions from respiratory system.

Abs.RS.44

Comparative Study of Peak Expiratory Flow Rate and Maximum Voluntary Ventilation Between Smokers and Non-smokers

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Objective : To study effect of smoking on Peak Expiratory Flow Rate and Maximum Voluntary Ventilation in apparently healthy tobacco smokers. A control study to assess the Peak Expiratory Flow Rate and Maximum Voluntary Ventilation in healthy tobacco non-smokers. To compare the result of both the studies to assess the effects of smoking. To confirm the hazards of tobacco use and discourage its use.

Method : The present study was carried out by computerized software of Pulmonary Function Test named 'Spiro Excel' at Pulmonary Function Lab, Department of Physiology, Govt. Medical College, Bhavnagar on 100 male healthy subjects. Out of them 50 were non-smokers and 50 were smokers. Smokers are divided in three groups. Subject was explained and demonstrated about the procedure to be performed. Full series of test take 4 to 5 minutes. Tests were compared in the both smokers and non-smokers group by the 'unpaired t test'. Statistical significance was indicated by 'P' value <0.05.

Results : From the result it is found that actual value of Peak Expiratory Flow Rate and Maximum Voluntary Ventilation are significantly lower in all smokers group than non-smokers. The difference of actual mean value is increases as the degree of smoking increases.

Conclusion : Therefore, it is concluded that Peak Expiratory Flow Rate and Maximum Voluntary Ventilation are lower in active smokers than non-smokers. The actual

value of pulmonary function is decrease as the number of tobacco smoking products increase.

Abs.RS.45

Six Minute Walk Test : Best Predictor For Exercise Desaturation in COPD

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Objective : Six minute walk test is a simple, cost-effective means of assessing functional capacity in cardiopulmonary diseases. Chronic obstructive pulmonary disease is emerging as a fourth leading cause of mortality and morbidity worldwide. A few studies have examined the predictive variables among exercise parameters in COPD, we therefore attempted to identify the best index for predicting exercise desaturation in patients of COPD amongst the six minute walk test variables.

Material and Methods : Sixty patients(30 males and 30 females) with moderate to severe COPD with baseline SpO₂ ≥ 90% volunteered and completed testing sequence, which included resting pulmonary function testing followed by Six minute walk test. Bivariate analysis was done and those variables with significance were fitted in linear regression model to determine independent predictive value.

Results : Thirty three patients (17 females and 16 males) of those who desaturated on 6 mwt showed statistical significance difference

between Desaturators and Non-Desaturators in distance covered ($P<0.000$), baseline Spo₂ ($P<0.000$), change in dyspnea ($P<0.006$). Pearson correlation showed significant correlation with baseline Spo₂ ($r=-0.605$, $P<0.000$), distance covered ($r=-0.579$, $P<0.000$) and dyspnea ($r=0.507$, $P<0.003$). On linear regression, the best independent predictor value found was baseline Spo₂ ($\beta=-0.314$, $P<0.013$) suggesting that 1 unit fall in oxygen saturation during 6 MWT occurs with every 0.31 unit decrease baseline spo₂.

Conclusion : The role of resting Spo₂ in COPD is of prime importance in predicting those who will desaturate during daily activities. The routine screening in OPD by pulse oximetry is suggested to screen high risk COPD patients so as to plan domiciliary oxygen treatment in them and improve their prognosis.

Abs.RS.46

Socio Economic Status and Gender : Independent Risk Factors for COPD

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Objective : COPD is projected to rank third leading cause of deaths globally by 2030. The existing evidence is indicative of the fact that a poor socio-economic status also constitutes a Risk Factor. The aim of the present study was to study the socioeconomic status and gender of the subjects with COPD and evaluated pulmonary function tests and compare them with healthy controls.

Result : Lung functions namely FEV₁, FVC, FEV₁/FVC% and FEV₁% PREDICTED showed significant reduction in COPD groups as compared to healthy non smoker controls. The Mean Age of the subjects in Control Group was 38.36 ± 13.24 years. Out of sixty controls, 46 were males (76.67%) and 14 were females (23.33%). The Mean Age of the COPD patients was 43.14 ± 13.04 years. Out of 121 COPD patients, 80 were males (66.11%) and 41 were females (33.89%). In Control Group and COPD cases 6.66% and 5.78% belonged to Upper High Class. 15% subjects in the Control Group and 9.92% subjects in the COPD Group belonged to High Class. 25% subjects in the Control Group and 19.84% subjects in the COPD Group belonged to Upper Middle Class. 26.67% of the subjects in the Control Group and 28.10% subjects in the COPD Group belonged to Lower Middle Class. 15% and 18.18% subjects belonged to Poor Class in the Control and COPD Groups respectively. 11.67% subjects in the Control Group and 18.18% in the COPD Group belonged to the Very Poor/Below Poverty Line Class.

Conclusion : The present study identifies that gender and socio economic differences play a role in pathophysiology of COPD characterized by decline in lung functions.

Abs.RS.47

Fat Free Mass and Fat Free Mass Index as Reference Variable for Lung Function

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Objective : To assess the correlation of pulmonary function with body Fat percentage, Fat free mass, Fat Free Mass index and Body Mass Index and establish them as reference variable.

Method : A total of 100 subjects (males=57, females=43) aged between 17-24 years were included in the study. Their age, sex, height and weight was recorded. Body Mass Index (BMI) was calculated. Body fat percentage was measured by 'Bioelectric impedance' method using "OMRON Body fat monitor (HBF-306)". Fat free mass (FFM) & Fat Free Mass Index (FFMI) was calculated. Individuals were subjected to spirometry measurements with window based "Flowhandy ZaN 100 USB & ZaN GPI 3.xx."

Results : Statistical analysis of the data was done for the comparative study. In males Fat free mass and Fat free mass index showed positive correlation with VC, TV, IC, IRV, FVC, FEV1, PEF which is stronger than body fat percentage & BMI, FFM & FFMI showed negative correlation with ERV. In females FFM & FFMI are positively correlated with VC, TV, IC, FVC, FEV1, PEF which is more strongly correlated than body fat percentage and BMI & negatively correlated with ERV.

Conclusion : Hence, the lung function are better correlated with Fat free mass and Fat Free Mass Index than Body fat percentage and Body Mass Index.

Abs.RS.48

Comparison of Lung Function Test Inyoung Adult Engaged in Akhada With Ist Year Medical Students

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Background and Objectives : As reports on effects of exercise in akhada Pahalwan on Pulmonary Functions are not available; the present study was carried out in young adults of Eighteen to Thirty years of age group to assess their Pulmonary Functions.

Method : Subjects were divided into two groups (study group and control group). Subjects of Study group (n=37) were engaged in exercise in Akhada for at least two years. Control group (n=30) was of Ist year medical students not engaged in any regular exercise. Lung volumes were recorded by Pulmonary Function test machine and analysed statistically. An interview schedule was used for all subjects in the study to obtain information related to age, socioeconomic status, and relevant personal and family history. Kuppusswamy's Socioeconomic Status Scale including criteria like education, occupation and family income was used and accordingly individuals belonging to middle class family on the basis of this scale were included.

Results : The Forced Vital capacity was highly significant statistically when subjects who were engaged in practicing exercise in the akhada (3.98L) were compared to the control group (3.61L). Both Inspiratory vital capacity and Inspiratory reserve volume in the akhada persons were greater (3.86 L & 1.84 L) than

the control group (3.46L & 1.60 L). Expiratory reserve volume also showed the similar decreasing trend in the two groups although statistical significance was not observed. The mean value of forced expiratory volume in first second (FEV1) of akhada persons was (3.47 L/sec), more than that of the control group (3.31 L/sec). The Peak Expiratory flow rate was greater in controls (7.60L/sec) than that of study group (7.10 L/sec). Similarly the Maximum Expiratory Flow rate between 25-75 % of vital capacity was also low in the study group (4.30 L/sec) than the control. Again the Maximum Expiratory Flow rate at 50% of vital capacity of akhada persons (5.1607 L/sec) was less than that of control group (5.26L/sec). Also the Maximum Expiratory Flow rate between 75-85% of vital capacity of control group (7.10L/sec) was more than the study group (6.37 L/sec). Maximum Expiratory Flow rate at 25% of vital capacity of control group (2.46 L/sec) was greater than the akhada pahalwans (2.30 L/sec).

Interpretation and conclusion Akhada is a traditional Indian exercise pattern, which includes both aerobic and anaerobic exercises and almost every group of muscles are worked upon. However, there is paucity of scientific data as hardly any studies have been performed on these subjects. In the present study it is concluded that akhada pahalwan have higher lung functions due to strong muscles of respiration. However, it is suggested that further studies need to be taken up on persons practicing in akhada on various other physiological parameters in order to scientifically document the holistic influence on the body physiology. Findings of the present study emphasize the benefits of

exercise in akhada on lung functions.

Key Words : Akhada, Exercise, Pulmonary Functions

Abs.RS.49

Study of Pulmonary Functions in Brick Kiln Workers in Ambala District (Haryana)

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Objective : The objective of this study was to assess Pulmonary functions among brick kiln workers in Ambala district (Haryana) and to assess the extent of impairment and its relation to duration of employment.

Method : After taking informed consent, the Pulmonary function tests were conducted on 30 male non-smoker brick kiln workers by using computerized spiro-excel (Medicaid System Chandigarh). These workers were categorized into 3 major group on basis of their exposure to/working duration in the industry i.e. exposure from 1-5 years, 6-10 years and 11-15 years.

Parameters recorded were PEFr, FEV1, FVC, FEF(25-75%) and FEV1/FVC%. For each participant chest x-ray (PA view) 35*35cm were also taken. The results were compared with those of 30 non smoker age and sex matched control group randomly selected from general population who never worked in industry.

Results : Our result showed significant decrease (P value <0.05) in PEF, FEV1, FVC, FEF25 – 75% in brick kiln workers. However the decrease was highly significant (P value <0.001) in group whose duration of exposure was longer.

Conclusion : This study indicates that workers in Brick Kiln factory are at high risk of developing obstructive Ventilatory Impairment and or restrictive ventilatory impairment and degree of impairment directly correlate with duration of employment.