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425. Work, the environment and respiratory disease

P4189
Genetic risk factors for meat wrapper's asthma
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The fumes of polyvinylchloride (PVC) wrap cause respiratory difficulties and meat wrapper's asthma.
The pathophysiologic mechanism for this malady is not clearly understood. Antioxidant enzymes constitute the endogens defence from toxic products. The M and T classes of glutathione S-transferase play the important role in the response to oxidative stress in the lung.
This study
Aims: To investigate GSTM1 and GSTT- polymorphism in association with bronchial responsiveness and development of asthma in meat wrappers (MW).
Methods: 45 MW and 77 workers of another trades in meat processing and packing factory, both male and female, mean age 40.1 yrs were examined at the workplace. Respiratory symptoms were recorded on a questionnaire. Lung function tests and peak expiratory flow (PEF) were performed during the shift and out of the work. Blood was collected to determine GSTM1 and GSTT genotypes (PCR).
Results: Airway hyperresponsiveness (AH) and asthma symptoms were recorded in 18 out of 45 (40%) MW after the exposure to PVC fumes, as compared to other workers (19 of 77, 15.6%) p < 0.002. The high prevalence of GSTM1 and GSTT – null genotypes were noticed in 35.5% and 11.8% MW respectively. 7.9% of MW had both deletion of GSTM1 and GSTT. The deletion of the entire genes and absence of the enzymes were associated positively with decreases in FEV1 and PEF (r = 0.67; 0.78) and varied according to the length of service.
Conclusion: Our data suggest that the GSTM1 and GSTT – null genotypes are associated with the higher susceptibility to PVC-induced AH and development of asthma.

P4190
Upper airways irritation syndrome (UAIS) and loss of pulmonary function at the workers exposed to cotton dust
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Aim: To specify correlations between UAIS and loss of pulmonary function versus occupational risk, in workers from a small company that processes cotton.
Material and methods: We are investigated 45 workers aged 29-63 years and various length of service (more than 10 years) by two cross-sectional surveys at 5 years interval versus a matched-control group; The percentage of smokers was low (9%). A questionnaire was completed, clinical examinations and pulmonary function test (PFT) were performed for each worker.
Results: In the 1st exam the UAIS was diagnosed in only 8,8% of the exposed group. PFT has been modified to only one of the exposed workers.
In the second stage of the study, UAIS was more frequent, having a prevalence of 44% to exposed group, with these clinical aspects: laryngeal irritation (60%), frequent hoarseness and dry cough (55,5%), nasopharyngeal irritation (47%),

sneezing (38%) and allergic diseases (18%). The prevalence of the respiratory symptoms was higher among the exposed subjects (p≤0,005). The pulmonary function test (PFT) put in evidence a distal obstructive syndrome (DOS) in 20% of the exposed workers (versus 3% at control group; p≤0,0002). We found significant increase of obstructive dysfunctions associated with length of service. The mean values of the FEF1.0/FVC report and the PEF values are significantly less at the cotton exposed subjects (in second part of study) versus the controlled ones.
Conclusions: This study reports a high prevalence of UAIS and DOS among workers exposed to cotton dust, which correlated with length of service. It requires technical and organizational measures to reduce occupational exposure to respiratory dust.

P4191

Use of shuttle test on a group of healthy sugar cane workers, Sao Paulo, Brazil

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Introduction: The shutlle walking test (ST) is used to assess functional capacity in individuals with pulmonary diseases. Its use in healthy workers may be useful to evaluate exercise capacity. The practice of burning the sugar cane field in the night before harvest is common, and emits large amounts of pollutants.
Aims: To evaluate the exercise capacity in a group of the burning sugar cane workers and a control group, during harvest and non-harvesting periods.
Methods: 112 sugar cane workers and 107 controls, young man, non-smokers were submitted to ST 2 periods. At the beginning and end of the test, heart rate (HR), respiratory frequency, blood pressure, SpO2, and Borg score were measured and the walking distance recorded. Data were analyzed and compared using t-test ior Mann-Whitney Test.
Results: The mean age, the body mass index (BMI) kg/m^2 and the HR were higher (p<0,001) in the control group: (29.1±6.4) vs (25±5.2) years; BMI: (29.3±6.4) vs (24.62±5.2); and HR: (98.4±16.9) vs (84.9±13) bpm, respectively. The median walking distance by the two groups at the end of the test was 1380 (IIQ:290) meters, 25% of the controls and 75% of cutters. In the period of harvest the sugar cane cutters presented significant increase in (p<0.05) diastolic blood pressure at the end of the exercise. No significant alterations in SpO2 between groups and periods were found.
Conclusions: We demonstrated that sugarcane workers (SW) have better physical performance and exercise capacity than control subjects, although SW showed an elevation in diastolic blood pressure in ST, as observed in a previous study by our group. Support by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)/Brazil

P4192

Prevalence of respiratory symptoms in 7154 state road transport workers from India

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Regular exposure to high levels of vehicular air pollutants is likely to predispose road transport workers (bus drivers, conductors and garage workers) to a high risk of respiratory illnesses.
Aim: To study the prevalence of respiratory symptoms amongst road transport workers from Andhra Pradesh State of India.
Methods: All employees present and willing to participate, from 24 randomly selected bus depots of 7 cities and towns of Andhra Pradesh State Road Transport Corporation (RTC) participated in this cross sectional study. Every individual was administered a respiratory health questionnaire that captured prevalence of respiratory symptoms.
Results: 7154 employees (41.4% drivers, 30.4% conductors, 15.9% garage workers, 7.9% office workers) participated in the study. Average age was 41.6±9.5 years. 27% of all the RTC employees had at least one respiratory symptom during the previous 3 months. Prevalences of rhinitis/rhino-sinusitis, cough, wheeze, breathlessness and chest pain/tightness were 14.7%, 10.5%, 8.3%, 7.9% and 5.6% respectively. Prevalence of respiratory symptoms were significantly higher in office workers (34.9%) as compared to drivers (24.2%; p<0.0001), conductors (25.4%; p<0.0001); and garage workers (30.0%; p< 0.05). Prevalence of respiratory symptoms amongst garage workers was also significantly higher than drivers and conductors (p<0.0001 and p=0.005 respectively). Smoking was not a confounding factor.
Conclusion: Road transport workers have a high prevalence of respiratory symptoms with significantly greater values amongst office based workers and garage workers when compared to drivers and conductors.

P4193

Evaluation of cardiopulmonary effects and oxidative stress in sugarcane workers compared to a control population exposed to outdoor biomass air pollution

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Brazil is the world's largest producer of sugar and alcohol. The practice of burning the sugarcane field in the night before harvesting in order to facilitate cropping and thereby increase productivity is still very common. This biomass burning emits large amounts of particulate (PM) and gaseous pollutants to the atmosphere.
With the aim of studying cardiopulmonary impacts and oxidative stress in a population of 113 sugarcane workers (SW) and 109 local healthy controls (C), we evaluated lung function tests (LFTs), blood pressure (BP), heart rate variability (HRV) – in submaximal treadmill protocol – and laboratory tests in pre-harvest and harvest periods. All subjects were male non-smokers. Data were submited to univariate and LMM multivariate analysis.
Results: Median age was 28.4 (C) and 23 (SW); P=0.02.
In the harvest period (median atmospheric PM$_{2.5}$=75.3µg/m^3 in sugarcane tillage area vs 27.7µg/m^3 in city area) there was a significant higher increase in CPK levels in SW than in control subjects, as well as a higher reduction in LFTs. We also found a significant higher increase in diastolic BP and decrease in HRV among sugarcane workers in harvest period. Another important result, was the statistically significant reduction in antioxidants enzymes SOD, GST and GPX in the harvest period, much more expressive among sugarcane workers than in control subjects. We conclude, therefore, that even in healthy populations, exposure to biomass outdoor pollution can cause cardiopulmonary detrimental effects with potential clinical relevance and that such impacts can be probably explained by the physiopathologic pathway of oxidative stress.

P4194

Serum biomarkers analysis in workers with occupational salt dust exposure in underground conditions in dependence of length of service

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Objective: We assessed serum biomarkers distribution in underground workers with occupational salt dust exposure in dependence of length of service.
Methods: Serum samples of male donors who are not working at Belaruskaly, and workers employed in underground working conditions of Belaruskaly with a mean age 40±7 years were enrolled. All donors were divided into 4 groups.Group I included healthy donors who do not work in the enterprise; II - workers with underground work experience of 5 years; III- consisted of workers with underground work experience of 5 to 15 years; IV - workers with underground experience of more than 15 years.To analyze the qualitative composition of serum proteins were obtained by two-dimensional maps of proteins in blood serum from healthy donors and the study group by two-dimensional gel electrophoresis.Proteomic maps were statistically analyzed in dependence of length of service.
Results: We found that total protein value in group II-IV differed from the samples of the 1st group. No statistically significant changes nave been revealed in the serum protein composition of underground workers.Proteomic maps revealed abnormalities indicating the presence of inflammation in the bronchopulmonary system of workers. This could be the diagnostic indicator of early stages of lung diseases in the absence of clinical evidence.
Conclusions: Analysis of serum proteome changes under the influence of sylvinite aerosols could help to search for specific biomarkers of the body functioning of workers under the influence of occupational factors and predict risk of lung morbidity in occupational exposure to sylvinite aerosols.

P4195

Occupational risk factors may be of importance to define populations suitable to screening of lung cancer

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Aims: To estimate the attributable fractions (AF) of lung cancer to occupational exposures in an area characterized by its high lung cancer incidence and a past in heavy industry.
Methods: A population-based case-control study was performed in the Northern part of Lorraine, France (2006 to 2010). Cases were defined as males with histologically confirmed lung cancer. Controls were selected by a random digit dialing

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procedure in the study area. All cases and controls were interviewed in a face to face interview in order to fill in standardised questionnaires on risk factors of lung cancer. Occupational exposures were assessed using both a lifelong list of all jobs held for at least one month, specific questionnaires of industrial activities and job-tasks questionnaire. Qualitative and quantitative occupational exposure indices were then calculated. AF and CI95% were computed for each occupational exposure index and globally for all significant occupational exposures.

Results: 219 cases and 520 controls were included in this study. After adjustment on age, smoking duration, time since quitting smoking, a significant dose-response relationships were found with log of cumulative exposure per unit for asbestos (OR: 1.175, p=0.003), silica (OR: 1.109, p=0.001) and Polycyclic Aromatic Hydrocarbons (OR: 1.175, p=0.007). AF were ranged between 38% (CI95% 27-48) and 57% (CI95% 42-68) according to different models, for these three agents or their association.

Conclusion: According to very high AF observed in this study, these results strongly suggest to include occupational risk factors in definition of populations at high risk of lung cancer for the secondary prevention of lung cancer.

P4196
Feather duvet and idiopathic pulmonary fibrosis

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Introduction: Up to 5% to 10% of cases of idiopathic pulmonary fibrosis (IPF) may actually be hypersensitivity pneumonitis (HP) that has been erroneously diagnosed. The hypothesis of this study is that exposure to a feather-filled duvet or pillow can be a cause of pulmonary fibrosis that is erroneously diagnosed as IPF. **Material and methods:** Between 2004 and 2010, 318 consecutive patients were studied. The diagnosis was based on internationally established criteria. Emphasis was placed on detecting transitory exposure to a possible environmental agent, particularly the use of a feather duvet or pillow. Furthermore, in patients whose questioning revealed exposure to an uncommon causal antigen or low-intensity exposure, specific IgG to antigen extract was determined, and specific bronchial challenge (SBC) were carried out. Surgical lung biopsies (SLB) were reviewed. **Results:** 60 patients were diagnosed with IPF. 24 patients had previous contact with a feather duvet or pillow for at least one year. In 15 patients the final diagnosis was HP; 8 by SBC and 2 by characteristic pathologic findings. HP was diagnosed in 3 patients with atypical usual interstitial pneumonia in SLB+ positive IgG testing and in 2 patients with bronchoalveolar lavage lymphocytosis (>20%) and positive specific IgG to the causal agent. In 36 patients without previous contact, HP was diagnosed in 8 patients.

Conclusion: In IPF, thorough clinical questioning can reveal the existence of a low-intensity, but persistent exposure to a known causal agent. HP due to exposure to a feather duvet can be the cause of some cases of pulmonary fibrosis, a condition that can have different prognosis.

P4197
The value of lymphocytosis in bronchoalveolar lavage in the differential diagnosis between idiopathic pulmonary fibrosis and chronic hypersensitivity pneumonitis

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Introduction: Bronchoalveolar lavage (BAL) is a minimally invasive, well-tolerated bronchoscopy procedure which plays an important role in the diagnosis of interstitial lung disease (ILD). We assessed the value of lymphocytosis in BAL fluid for the differential diagnosis.

Material and methods: Prospective study of all the 318 patients with ILD through 2004-2010. During the diagnostic process, cytological and immuno-histochemistry studies of BAL fluid were performed.

Results: We studied 318 patients with ILD (57 FPI, 92 NH, 45 Sarcoidosis). BAL was performed in 230 patients (72%), obtaining median lymphocyte percentages of 8%, 20% and 25% in IPF, HP and Sarcoidosis respectively. Lymphocyte counts were >60% in non IPF patients, 5% of HP and in 2% of Sarcoidosis patients; were >30% in non IPF, 18% HP and 29% Sarcoidosis, and >20% in 5% IPF, 32% HP and 33% Sarcoidosis.

In a study focused exclusively on chronic NH occurring with IPF criteria (ATS/ERS criteria) (n=60), three presented lymphocytosis >20% but were ultimately diagnosed with HP. Lymphocytosis >15% was found in 5/11 (45%) IPF and 3+3/11 (55%) of patients with final diagnoses HP. Lymphocytosis between 10-15% was present in 8/14 (57%) IPF and 6/14 (43%) HP. No significant differences were found in the cellular profile between IPF and HP.

Conclusions: Lymphocytosis >20% is also a characteristic of HP and Sarcoidosis, since is very rarely found in IPF (5% in our series). In chronic HP the absence of lymphocytosis in BAL >20% does not rule out the diagnosis (35% diagnosed with HP in our series).

P4198
The relation between air pollution and respiratory tract diseases by months in Duzce City of Turkey

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Aim: To investigate the relationship between levels of particulate matter (PM_{10}) and sulphur dioxide (SO_2) and the patients with COPD, asthma, respiratory tract infection (respiratory tract disease-RTD) applied to policlinics in the central part and counties of Duzce.

Material: Between 1 January 2009 and 31 December 2009 in Duzce Ataturk State Hospital, the patients diagnosed as RTD at chest, internal medicine, ENT, pediatric polyclinics were retrospectively evaluated. The monthly average values of SO_2 and PM_{10} obtained from the official data of Ministry of Environment and Forests.

Results: 53.1% of 29,367 cases were female. 64.4% of cases were adults. The average SO_2 and PM_{10} concentration was highest in November, December, January and those were the lowest in July, August, September and October. Acute bronchitis were higher than the remaining in January (26.9%) and December (25.4%), while those were the lowest in July 16.4%) and September (20.4%), respectively. COPD were more frequent in January (10%), February (10.9%), March (13.1%), but less in September (5.9%). Asthma were most admitted in December (10.6%), January (9.6%) but less frequently in September (6.1%). Pneumonia were frequently admitted in November (10.6%), January (9.6%). The allergic rhinitis was the most common at the seaside (119/479, 24.8%) (p=0.000). Upper RTD (58%) were higher than the lower RTD in the months that the air pollution was the highest (p=0.000).

Conclusion: It was speculated that polyclinics admissions of COPD, asthma, acute bronchitis, pneumonia seem to be associated with air pollution and also living in the seaside may lead to more increase in applications regarding allergic rhinitis.

P4199
Influence of high values of air pollutants on number of asthma exacerbations in children from Pancevo in years 2009 and 2010

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Introduction: Air pollution is well known for it's influence on development of asthma. Children with asthma are specially vulnerable on high levels of air pollutants.

Aim: To show that elevated air pollution (tar, SO_2, NO_2, TSP, NH_3 and benzene) have significant influence on acute exacebations of asthma in children.

Method and results: We have monitored daily concentrations of tar, SO_2. NO_2, TSP, NH_3 and benzene in city of Pancevo in October, November, December, January and February and number of children who visited pediatrician due to acute asthma exacerbation. We have excluded other months to avoid influence of higher levels of pollen. We have observed that during periods with high peaks of tar, TSP and benzene, larger number of children had acute asthma exacerbation and visited pediatrician. SO_2, NO_2 and NH_3 were within legally permited range.

Results have shown that in year 2009 in January, February, October, November and December tar, TSP and benzene were above permited values 73 days and in that period 1736 children had asthma exacerbation. In the same period in 2010 the same air pollutants were 44 days above permited values and 939 children had asthma exacerbation. During periods with air polution below permited values in 2009, 1331 children had asthma exacerbation in 78 days, and in 2010, 1508 in 107 days. This difference is statistically significant, which was confirmed by χ^2 – test, for year 2009 $\chi^2 = 3.987$, and for 2010 χ^2 was 4.91, p> 0.05.

Conclusion: High concentrations of tar, TSP and Benzene have significant influence on larger number of asthma exacerbations in children, specialy during periods of oversteping legally permited concentrations.

P4200
The relationship of air pollution and surrogate markers of endothelial dysfunction in a population-based sample of children

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Background: This study aimed to assess the relationship of air pollution and plasma surrogate markers of endothelial dysfunction in the pediatric age group.

Methods: This cross-sectional study was conducted in 2009-2010 among 125 participants aged 10-18 years. They were randomly selected from different areas of Isfahan city, the second large and air-polluted city in Iran. The association of air pollutants' levels with serum thrombomodulin (TM) and tissue factor (TF) was determined after adjustment for age, gender, anthropometric measures, dietary and physical activity habits.

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Results: Data of 118 participants was complete and was analyzed. The mean age was 12.79 (2.35) years. The mean pollution standards index (PSI) value was at moderate level, the mean particular matter measuring up to 10 mum (PM10) was more than twice the normal level. Multiple linear regression analysis showed that TF had significant relationship with all air pollutants except than carbon monoxide, and TM had significant inverse relationship with ozone. The odds ratio of elevated TF was significantly higher in the upper vs. the lowest quartiles of PM10, ozone and PSI. The corresponding figures were in opposite direction for TM.

Conclusions: The relationship of air pollutants with endothelial dysfunction and pro-coagulant state can be an important factor in the development of atherosclerosis from early life. This finding should be confirmed in future longitudinal studies. Concerns about the harmful effects of air pollution on children's health should be considered a top priority for public health policy; it should be underscored in primordial and primary prevention of chronic diseases.

P4201

Prediction of the acute mountain sickness using SaO2 indices at rest and exercise in hypoxic conditions

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The aim of the study was to compare the oxygen saturation at rest and exercise during the simulated high altitude ascent in subjects who had suffered from acute mountain sickness (AMS) as well as healthy subjects. Ninety seven subjects were divided into three groups depending on the Lake Louise score during the previous staying at high altitude (3800 m above sea level). The 1st, control, group consisted of 62 people without AMS symptoms; the 2nd group included 18 patients with mild AMS (3-4 points in LL score) and 17 subjects with moderate to severe AMS made the 3rd group (5 or more points in LL score). SaO2 indices were taken at rest and after 5 minute of strenuous bicycle test both at normoxia (760 m) and inside the hypobaric chamber (4500 m above sea level, 30 minutes).

Results: It was revealed that rest oxygen desaturation rate was significantly higher in the 2nd and 3rd group compared with the 1st, control, group (rest ∆SaO2 – 16,0±0,5% and 16,5±7% compared with 14,2%, p>0,05) while the exercise oxygen desaturation rate was significantly higher in the 3rd group compared with 1st and 2nd group (exercise ∆SaO2 – 24,7±0,8% compared with 18,5±0,8% and 21,7%, p>0,05).

Conclusion: Both rest and exercise indices of oxygen saturation during the simulated ascent to high altitude may be used as prediction markers for acute mountain sickness.

P4202

Airborne particulate matter (PM10) decreases respiratory activity in mitochondria isolated from lung tissue

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Airborne particulate matter (PM10) has potential adverse health effects in human, especially in lung tissue and those effects are related to an increase in several diseases and cancer. We have previously demonstrated that PM10 increases reactive oxygen species (ROS) formation, decrease in antioxidant enzymes activity and these effects are observed under sub-lethal conditions. In this regard, mitochondria are the main source of ROS but little is known about alterations induced in mitochondrial function after PM10 exposure. We hypothesized that if PM10 induces an increase in ROS generation, it could be possible to find alterations mitochondrial function. To test our hypothesis we exposed enriched mitochondria preparations from lung tissue of rat for 1 hour to the following PM10 concentrations: 1, 5, 10, 30 and 50 µg/mL. We measured the oxygen consumption after PM10 exposure using a Clark type electrode and also the activity of mitochondrial complexes. In addition, the mitochondrial membrane potential was determined by rhodamine 123 staining using confocal microscopy. Our results showed a decrease in the respiratory control index and ADP phosphorylation over 50%, a decrease in the activity of complex IV and an important decrease in mitochondrial membrane potential. In conclusion, PM10 induces a decrease in oxygen consumption, ADP phosphorylation and loss of mitochondrial membrane potential. These effects are related to the decrease in activity of complex IV. Our research will be guided to investigate if the mitochondrial alterations induced by PM10 exposure could be related to mitochondrial dysfunction and metabolic alterations found in cancer cells.

P4203

Prevalence of asthma and allergy symptoms and pulmonary function testing in sugar cane and tobacco field workers in Honduras

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We previously demonstrated a very high prevalence of wheezing (89%) and lower pulmonary function tests (PFT) in rural Honduran children of the Rio Grande O Choluteca valley where sugar cane is burned 8 months of the year compared

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to children of Jamastran valley (17% wheezing) where no crops are burned. We applied a similar asthma/allergy questionnaire and performed PFT on sugar cane field workers (SC) of the Rio Grande O Choluteca valley and tobacco field workers (TOB) of the Jamastran valley. Tables 1 & 2 summarize questionnaire findings and PFT values of the two groups.

Table 1. Questionnaire findings

Type Worker	Age (yrs) ±1SD	Years Worked	Ever Wheeze	Wheeze 12 mos	Night Cough	Chronic Rhinitis	Itchy Eyes
SC (n=50)	24.4±8.4	5.4±5.1	38%	26%	68%	52%	40%
TOB (n=68)	51.0±12.4	13.6±10.1	45%	31%	61%	41%	50%
p	<0.0001	<0.0001	NS	NS	NS	NS	NS

Table 2. PFT % predicted (mean ± 1SD)

Type Worker	FVC	FEV1	FEF25-75
SC	99.9±13.2	102.7±14.2	107.5±28.0
TOB	112.3±20.4	111.8±21.9	111.3±37.9
p	0.0003	0.012	NS

We found the SC workers to be significantly younger with thus fewer years working in the fields compared to the TOB workers. Both groups were found to have similarly high prevalence's of ever wheezed, wheezed in last 12 months, night cough, smoking frequency, chronic rhinitis and conjunctivitis. SC workers have significantly lower FVC and FEV-1. We conclude that both SC and TOB field workers in Honduras have a high prevalence of asthma and allergy symptoms and SC workers, although younger with fewer years of exposure, have lower pulmonary function. Individual air quality sampling of the two groups is needed to delineate the contribution of environmental work exposure to these findings.

P4204

Asthma and allergy to laboratory animals in university employees: Need for prophylaxis

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Introduction: Subjects exposed to laboratory animals are at high risk of developing respiratory and allergic diseases. The reported prevalence of occupational asthma ranges from 1.4 to 9.5%, and occupational rhinitis from 2.9 to 18.8% (reviewed by Foletti, I. *et al.* Allergy 2008; 63:834-41). In the moment, few studies have looked at programs to prevent these diseases.

Objectives: To assess the prevalence of asthma and atopic sensitization to common allergens, and to evaluate the employment of prophylactic measures in two Brazilian universities.

Methods: Subjects exposed to laboratory animals in two Brazilian universities (University of S. Paulo and State University of Campinas) answered to specific questionnaires to assess work conditions, underwent spirometry, bronchial provocation with mannitol, and skin prick tests to eleven common allergens and five work-related allergens (rat, mouse, guinea pig, hamster, and rabbit).

Results: Eighty-five subjects (38±11 years old, 59 men) were evaluated. Fourty-four (51.8%) subjects were sensitized to at least 1 common allergen, and nine (10.6%) were sensitized to at least 1 work-related allergen. Twelve subjects (14%) presented hyperresponsiveness to mannitol. Personal protective equipments were available at work for 98%; however, 51% did not wear mask all the time when in contact with animals. Twenty-six percent of subjects received formal orientation about the risk assessment and hazard recognition related to laboratory animal allergy.

Conclusion: In this ongoing study, prevalence was relevant to support prophylactic measures. These measures need reinforcement.

P4205

COPD and exposure to smoke biomass in non-smokers women in a semi-rural region of Tunisia

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Many studies have suggested that biomass smoke is a risk factor for COPD and this study is conducted to compare, in non-smokers housewives, the prevalence of COPD symptoms and airway obstruction as related to biomass exposure.

Methods: From April to October 2010, 243 women over 30 years-old were randomly selected from a municipal list of the semi-rural city of Kasserine in Tunisia. Among the 140 non smokers women who consent to be explored, 81 (58%) are exposed to smoke biomass from traditional wood cooking (n=47) or traditional coal house heating (n=20) or both (n=14). An auto-questionnaire was administered and FEV1 and FEV6 were measured using an expiratory flow meter (PiKo-6).

Results: Age of exposed and non exposed housewives did not differ (48±12 yrs-old vs 48±12 yrs-old; p=1) but exposed women have lower education level (p<0.05) with higher jobless rate (73% vs 32%; p<0.05). Respiratory COPD-

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related symptoms were more frequent in exposed women either Cough (81% vs 19%;p<0.01) or Dyspnea (76% vs 24%;p<0.01). An FEV1/FEV6 of less than70%, considered as diagnostic of an obstructive disease, was more prevalent in exposed group (23.53% vs 4.16%; p<0.001).
Conclusion: COPD-related symptoms and airway obstruction are significantly more prevalent in non smokers women, from semi rural area in Tunisia, exposed to biomass smoke from traditional wood cooking or traditional coal house heating.

P4206
Snoring and obstructive sleep apnea among former World Trade Center (WTC) rescue workers and volunteers

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Background: Snoring and sleep disorders are common among individuals with adverse health effects from their WTC work exposures. Previous observations seemed to suggest that some forms of sleep disordered breathing (SDB) could be more prevalent in this population. We reviewed the results from nocturnal polysomnograms (PSG), to investigate whether REM-related OSA, and upper airway resistance syndrome (UARS) were more frequently diagnosed among WTC-exposed subjects compared to unexposed subjects.
Methods: 656 nocturnal PSGs performed at our sleep center were reviewed, 272 of them in former WTC workers. The diagnoses were categorized as: no SDB, simple snoring, REM-related OSA, UARS, and mild, moderate, and severe OSA. Bivariate and logistic regression analyses were used to examine differences in diagnoses between the two groups, using age, gender, body mass index (BMI) as predictors.
Results: The WTC group had a significantly higher predominance of the male gender (86.8% vs. 56.3%, p<0.001), but slightly lower mean BMI (31.4 vs. 33.2 kg/m², p=0.002). Table 1 summarizes the diagnoses on PSG. There was no significant difference between the two groups by Chi square (p=0.56), or logistic regression (p=0.77) with adjustment for the 3 significant predictors (age, gender, and BMI, all p<0.0001).

	No SDB	Snoring	UARS	RROSA	MildOSA	ModOSA	SevOSA
WTC	16	11	17	17	80	58	73
Non-WTC	32	21	20	22	119	63	107
Total	48	32	37	39	199	121	180

Conclusions: We did not detect any difference in the diagnoses derived from PSG between the WTC-exposed and unexposed subjects. OSA was significantly associated with age, BMI, and gender in this patient population.

P4207
Black carbon content in PM as a metric to evaluate the impact of the car-free Sundays of winter 2011 on air quality in Milan

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Foreword: By the 13th of February 2011 the number of days exceeding $50 \mu g/m^3$ of PM10 was over the EU annual limit of 35. The Milan Municipality decided to stop traffic 8 am to 6 pm on Sunday on Jan 30th and Feb 06th 2011 to reduce pollution. The decision was opposed by detractors, who claimed that no data were available about the efficacy of the restriction.
Scope: To measure outdoor PM10, PM2.5, PM10, and black carbon (BC) during car free Sunday and normal traffic days, and to compare air quality as the percent content of BC in PM (BC/PM).
Methods: Instrumentation: mass analyzer mod. Aerocet 531 (MetOne, USA) for PM concentrations, Microaethalometer mod. AE51 (Magee, USA) for BC. Procedure: the instruments were located at walkside in Corso Buenos Aires and were left operating 04:00 to 07:00 p.m. from Friday to Monday. Traffic density was also recorded.
Results: Overall% BC/PM mean (SD) was 5.8 (2.3) during the car free Sundays as compared to 12.04 (4.8) during the free traffic days (p<0.01).

Table 1. Percent black carbon content in PM during car-free Sundays vs normal traffic days

	Car-free Sunday Jan 30th and Feb 06th 2011	Normal traffic on Friday, Saturday and Monday
% BC/PM ratio mean (SD)	5.80 (2.3)*	12.04 (4.8)

*p<0.01 Student's t-test

Mean traffic density was 342 and 1858 vehicles/h during the car-free and normal traffic days, respectively.

Conclusion: During the 2 car-free Sundays, a great improvement in air quality was observed, with over 50% reduction in BC/PM ratio. These data show that car free Sundays represent a useful environmental intervention to protect people from traffic proximity pollution, a well known respiratory and CV risk factor.

P4208
The evaluation of the influence of occupational and non-occupational factors on the development of occupational COPD

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Occupational exposure is a known risk factor for chronic obstructive pulmonary disease (COPD). However the contribution of occupational exposure and smoking to COPD development has not yet been quantified.
Aims and objectives: The aims of this study were to ascertain the prevalence of COPD among industrial workers and to establish the relative contributions of smoking and occupational factors.
Methods: A cross-sectional study of 1,397 randomly selected industrial workers has been conducted. Among them, 625 had occupational exposure to vapor, gas, dust or fumes (VGDF). Baseline spirometry was performed for all the participants. Those with airflow limitation (FEV1/FVC <0.70) were examined by post-bronchodilator test. All the participants answered to questionnaire included the information on occupational history, respiratory symptoms and smoking habits.
Results: The overall prevalence of COPD was 7.5%, the odds ratio (OR) of occupational COPD development was 5.8 (95%CI 3.5-9.5; p<0.0001) with PAR%=20.3. Analysis of linear predictors in regression model showed that the effect of smoking on the COPD development ranges from 5 to 40% depending on other factor values. Meanwhile, the contribution of occupational factors in the development of COPD monotonously and significantly (p<0.0001) increased with the growth of WGDF levels: OR was from 1.8 (95%CI 0.9-3.5) to 28.4 (95%CI 13.8-58.6), PAR% from 1.2 to 28.8.
Conclusions: Smoking and VGDF are interacting factors and their influence can be considered as comparable under certain conditions. Thus, the prevention of COPD should include not only smoking cessation, but also reducing the levels of the occupational factors.