106. Mineral dusts

P1051
The frequency and factors for occurrence of asbestos-related diseases in the rural of Sivas localized on central Anatolia (cross sectional epidemiologic study)

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Objective: To determine the rate and affecting factors of asbestos-related diseases (ARD) in the villages close to ophiolitic units in the rural of Sivas, central Anatolia in Turkey.

Methods: Volunteers (age >35, >20 years resident) from villages close to ophiolitic units and from villages >20 km distant to ophiolitic units as control group were included. Chest X-rays and questionnaire for demographical data and respiratory symptoms were performed. A geological map was used to measure the distance between ophiolitic units and villages. Samples were taken from houses and soil sources and analyzed for asbestos with X-ray diffraction.

Results: 2987 volunteers (1148 male, 1839 female) from 48 villages close to ophiolitic units and 157 (91 male, 66 female) volunteers from 6 villages far to ophiolitic units were included. Mean age of study and control groups were 55.2 and 57.3 respectively. 292 patients (3 malignant mesothelioma, 289 pleural plaque) with ARD were identified from villages close to ophiolitic units. No ARD was identified in control group. Factors affecting ARD risk were male sex (OR:3.1, p=0.00), advanced age (OR:1.05 for every year of age, p=0.00), residency close to ophiolitic units (for each 1 km 12% increase) and, decrease in BMI (for each 1 unit 3.6% increase) in multivariate logistic regression analysis. Serpentine was found in samples of villages close to ophiolitic units, no asbestos was found in control villages.

Conclusion: ARD rate is high in residents close to ophiolitic units in rural Sivas. Factors associated with ARD development were advanced age, male sex and living close to ophiolitic units.

P1052
The impact of residential proximity to ophiolitic units in the development of asbestos related diseases

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Aim: To determine the relation between risk of asbestos related diseases (ARD) and the proximity of birthplaces to ophiolitic units (OU) which contains serpentinite in province of Sivas, Turkey.

Method: Records between 2000 and 2010 of mesothelioma, pleural plaque (PP), prostate cancer and breast cancer patients from cancer registry were reviewed. Samples were obtained from indoor plasterers and source of plasters. Birthplaces of patients were marked on a map with OU modified from geological map (mesothelioma: red square, PP: black star and OU: green areas).
We detected significantly impaired gas exchange in all three groups. Association between DLco and fiber-years was 95%-CI 79%, 89%, respectively. DLco was below the lower limit of normal in 41 had normal chest X-ray findings. Pulmonary gas exchange was reduced in all pulmonary fibrosis radiological findings.

Aim: Impairments occur in the absence of radiological abnormalities.

Exposure to asbestos can cause a restrictive lung disorder with impaired pulmonary gas exchange. It is controversial, whether lung function impairments occur in the absence of radiological abnormalities.

Background: To assess CO-diffusion capacity in asbestos-exposed workers according to radiological findings.

Methods: Medical surveillance of 63 male workers formerly asbestos-exposed included a comprehensive medical and occupational history. All subjects underwent spirometry and bodyplethysmography according to ATS/ERS quality standards. CO-diffusion capacity (DLco) was measured according to Macnee et al. 2005. Results are reported as% predicted. Subjects were classified according to chest X-ray findings.

Results: Exposure varied widely across workers (2-420 fiber-years). Asbestosis (ILO>2/2, >pleural fibrosis) was found in 4 workers, 18 had pleural fibrosis and 41 had normal chest X-ray findings. Pulmonary gas exchange was reduced in all three groups: DLco 51% (95%-CI 24%, 78%), 73% (95%-CI 65%, 81%) and 84% (95%-CI 79%, 89%), respectively. DLco was below the lower limit of normal in 37 cases. Mean DLco of never smokers (n=12), ex smokers (n=24), and smokers (n=3), all with normal chest X-ray, was 85% (95%-CI 77%, 93%), 84% (95%-CI 76%, 91%), and 84% (95%-CI 70%, 99%), respectively. We found no statistical association between DLco and fiber-years.

Conclusions: We detected significantly impaired gas exchange in all three groups of workers formerly exposed to asbestos in the order asbestosis > pleural fibrosis > none. There was no relation to smoking habits. DLco was shown to be a sensitive method to detect early impairment of lung function in asbestos workers.

P1056

The sociodemographic and clinical characteristics of Turkish workers with pneumoconiosis

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Pneumoconiosis is an irreversible, preventable disease caused by dust inhalation. Although in other countries, by precautions the incidence decreased to 0.3-5%, it is still 10-15% in our country in pneumoconiosis causing occupations. We aimed to describe the characteristics of our 208 pneumoconiotic workers admitted to Istanbul Occupational Disease Hospital. Patient files between 01st Jan 2008 and 31st Dec 2010 are used for the descriptive study. All of the patients were male with 38.8±13 years of age. The most common workplace was Gaziosmanpasa with 27 cases. The mostly seen works were denim sandblasting, dental technicians, coal mining and casting (50,5%,5,6%,7,6,9,8). The most exposure material was silicium (86,5%). Mean exposure time was 9,5±8,9 years. Profusion according to the ILO classification was in the table. In 37 cases, there was an A opacity and B opacity in 28. The mean FEV1% was 67,27±23,3; FVC% 73,8±20,86; FEV1/FVC%85,1±16 and Keo 102,74±28,1. The period between exposure and

Radiographic profusion

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Background: Relationships between parietal pleural plaques and lung function impairment still remain controversial.

Aims: This study analyses the relationships between isolated pleural plaques and lung function, among subjects occupationally exposed to asbestos.

Methods: The study population consisted of 2,743 subjects included in a large-scale pilot screening program for asbestos-related diseases in four regions of France between 2003 and 2005. All had been occupationally exposed to asbestos, and were free of interstitial disease on high resolution chest computed tomography (HRCT). The asbestos exposure was assessed with calculation of an individual cumulative exposure index (CEI) taking into account all job periods for each subject. Each included subject benefited from pulmonary function tests (PFT) and HRCT was interpreted by a panel of expert radiologists in thoracic imaging. In both univariate and multivariate analysis, variables were adjusted on tobacco status, body mass index (BMI), CEI to asbestos and the center where PFT were made.

Results: Isolated pleural plaques were associated with a significant decrease of TLC (p=0.049), FVC (p=0.001) and FEV1 (p=0.003). On the other hand, no significant relationship was observed between pleural plaques and FEV1/FVC ratio. FEV1-75% and RV. A significant correlation was found between the extent of pleural plaques and the reduction of FVC (p trend=0.0089) and TLC (p trend=0.0464). By contrast, thickness of pleural plaques was not related to any functional impairment.

Conclusions: Our results are in favor of a relationship between isolated parietal and/or diaphragmatic pleural plaques and a trend to restrictive pattern.
symptoms were calculated as 10.48±8.7 years. Patients were mostly referred by a social security center, secondly by Sureyapasa training hospital and thirdly, admitted by themselves. The most common symptoms were breathlessness, cough and exertional dyspnea. The exposure time in a workday is very important but in our files there were no data showing this, so we planned to rearrange our patient files. Generally each paper in the literature discusses only one type of occupation causing pneumoconiosis. To our knowledge this is the first study concerning nearly all occupations causing the disease.

P1057

Respiratory symptoms, lung function impairment, and sensitization to metals in construction workers exposed to ashes, cement and ash-cement mixtures

Dragan Mijakoski1, Jovanka Karadžinska-Bislimovska2, Saso Stoleski2

Objective: To evaluate the prevalence of respiratory symptoms, lung function impairment, and sensitization to metals in construction workers exposed to ashes, cement and ash-cement mixtures.

Methods: We performed a cross-sectional study including 45 construction workers exposed to ashes, cement and ash-cement mixtures (mean age 43.1±6.84 years, mean job duration 19.5±7.1 yrs). In addition, 50 office workers (mean age 42.2±10.5 yrs, mean job duration 18.7±4.9 yrs) were examined as a control. Evaluation of examined subjects included completion of questionnaire on respiratory symptoms, lung function testing, histamine challenge test (PC20 <8 mg/ml), and patch testing.

Results: Compared with office workers, construction workers had more frequently respiratory symptoms (cough, phlegm, wheezing, and shortness of breath) in the last 12 months (40.0% vs. 16.0%, P<0.05). The difference was significant for cough (42.2% vs. 16.0%, P<0.05), wheezing (37.8% vs. 14.0%, P<0.05), and shortness of breath (44.4% vs. 14.0%, P<0.05). Lung function testing showed that construction workers had significantly lower%FEV1 and significantly lower%FVC1/FVC. Compared with office workers, construction workers had more frequently wheezing (37.8% vs. 14.0%, P<0.05), and shortness of breath (44.4% vs. 14.0%, P<0.05). The difference was significant for cough (42.2% vs. 16.0%, P<0.05), wheezing (37.8% vs. 14.0%, P<0.05), and shortness of breath (44.4% vs. 14.0%, P<0.05).

Conclusions: Construction workers had significantly lower%FEV1 and significantly lower%FVC1/FVC. Of interest is that 22.2% of all construction workers were positive in patch testing to nickel, nickel compounds, chrome, cobalt and iron.

References:

P1060

Airborne concentration of asbestos fibers in residences covered by asbestos-cement corrugated roofing sheets

Lara Maris Napolis1, Mario Terra-Filha2, Erica Bagentin3, José Alberto Neder1, Pedro Kunihiko Kiyohara4, Satoshi Kitamura5, Luiz Eduardo Nery2

Objective: To evaluate the prevalence of respiratory symptoms, lung function impairment, and sensitization to metals in construction workers exposed to ashes, cement and ash-cement mixtures.

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Conclusions: Construction workers had significantly lower%FEV1 and significantly lower%FVC1/FVC. Of interest is that 22.2% of all construction workers were positive in patch testing to nickel, nickel compounds, chrome, cobalt and iron.

References:

P1061

Cement dust exposure, respiratory symptoms and exhaled nitric oxide: A cross-sectional study

Alexander Tungu1,2, Magne Bratrøi1,2, Bente Moen1,3

Objective: To explore whether cement dust exposure is associated with increase in chronic respiratory symptoms and FENO concentration among cement factory workers in Tanzania.

Methods: The exposed group comprised 171 cement production workers while 98 workers from a beverage factory served as controls. Personal total dust samples were collected from the breathing zone of workers in the cement factory (n=130) and the beverage factory (n=116). The information on chronic respiratory symptoms was collected by a questionnaire, and FENO concentrations were measured by a NIOX Mino monitor among 117 exposed and 24 controls.

Results: Geometric means of total dust exposure among control and exposed workers were 0.6 mg/m³ and 5.0 mg/m³, respectively (p<0.001). The exposed workers and controls had similar age and smoking habits. The prevalence of from being the major risk factor for lung cancer, may be a co-factor in the development of asbestos in lung disease. The Health and Safety Executive report mentions the high rate of smokers in asbestos related industry [1]. We reviewed our local population of asbestos workers to explore that.

Methods: Between 1994 and 2007, 268 workers were seen for clinical assessment, spirometry, health safety advice and smoking cessation. A retrospective analysis of records, spirometry, smoking habits, effect of smoking cessation advice, was undertaken.

Results: 268 subjects were seen, 65 on multiple occasions. 214 (79%) were involved with asbestos handling or removal. 42 (16%) worked in supervisory or managerial capacities. 12 (5%) were laboratory analysts. Current smoking rates for handlers was 67% (144/214), managerial group 36%, and analysts 33% (p=0.015). Ex smoking rates were 11% for removers, 38% for the supervisory and manage- rial group and 8% for analysts. Non-smoking rates were 22% for handlers and removers, 46% for supervisors and managers and 58% for analysts. The rate of decline in FEV1 for current smoking handlers/asbestos removers was 52.8 ml per year, and for supervisors 22.3 ml per year (p=0.023). The mean FEV1 decline in non-smokers and ex-smokers was 37.5 ml/year.

Conclusions: Workers with highest asbestos exposure are significantly more likely to be current smokers and to have greater decline in FEV1, confirming greater disease risk [2]. Smoking behaviour has not changed since 1983. Consultant advice on cessation was ineffective for the group most at risk.

References:

P1069

Tobacco use in Sussex asbestosis workers

Thomas Medveczky, Charles Turton

Objective: To explore whether cigarette smoking is associated with increased in chronic respiratory symptoms and FENO concentration among cement factory workers in Tanzania.

Methods: The exposed group comprised 171 cement production workers while 98 workers from a beverage factory served as controls. Personal total dust samples were collected from the breathing zone of workers in the cement factory (n=130) and the beverage factory (n=116). The information on chronic respiratory symptoms was collected by a questionnaire, and FENO concentrations were measured by a NIOX Mino monitor among 117 exposed and 24 controls.

Results: Geometric means of total dust exposure among control and exposed workers were 0.6 mg/m³ and 5.0 mg/m³, respectively (p<0.001). The exposed workers and controls had similar age and smoking habits. The prevalence of
chronic respiratory symptoms was higher among exposed compared to controls; Wheezing (18% vs. 15.3%) Work related shortness of breath (15.8% vs. 6.1%), dyspnea (13.5% vs. 9.2%), chronic sputum production (8.4% vs. 1%) and chronic cough (4.6% vs. 1%). Exposed workers had higher mean FENO concentrations (26.0 ppm) than controls (20.0 ppm), but the difference was not significant.

Conclusion: Higher prevalence of chronic respiratory symptoms and FENO concentrations among exposed workers indicate an association between cement dust and airway inflammation.

P1062
does selection bias explain increases in pneumoconiosis observed in United States coal miners? Edward Petsonk1, Eva Suarthana2, Anthony Laney1, Anita Wolfe1, Janet Hale1, States coal miners?

P1062 Does selection bias explain increases in pneumoconiosis observed in United States coal miners? Edward Petsonk1, Eva Suarthana2, Anthony Laney1, Anita Wolfe1, Janet Hale1, Nicole Edwards1, Michael Attfield1, Division of Respiratory Disease Studies, National Institute for Occupational Safety and Health, Morgantown, WV, United States; Epidemiologic Intelligence Service, Centers for Disease Control and Prevention, Atlanta, GA, United States

Background: Radiographic surveillance among U.S. coal miners showed declining tenure-specific disease prevalence until 2000, when abnormalities consistent with coal workers’ pneumoconiosis (CWP) and progressive massive fibrosis (PMF) began to increase. Some have suggested the increase may be due to selection bias in the surveillance programs.

Methods: For the period 2006-2009, results from the routine health surveillance program (in which costs of radiographs are paid by industry) were compared with results of a government-funded enhanced surveillance program utilizing a mobile examination unit stationed in mining regions. Observed disease prevalence was stratified by region and by mining tenure, and compared between participants in the two programs.

Results: Overall, participants in the routine and enhanced surveillance programs were similar for participation rate, mining location (surface/underground), gender, and race/ethnicity. Participants in the enhanced program were older (47.1 vs. 36.4 yr), had longer tenure (21.8 vs. 11.4 yr), and higher prevalence of abnormal radiographs (3.9% vs. 1.9%) compared to the routine program. However, among miners with at least 20 years of mining, rates of both CWP (6.1% vs. 7.0%) and PMF (1.1% vs. 0.9%) were similar for participants in the enhanced and routine surveillance programs, respectively.

Conclusions: Tenure-specific prevalences in the routine and enhanced surveillance programs were similar, indicating that selection bias does not explain the recent increases in CWP and PMF among U.S. miners. Previous reports have implicated increased lung deposition of respirable dust and silica as explanations for the ongoing pneumoconiosis problem.

P1063 Epidemiologic and clinicopathologic analysis of malignant mesothelioma for last 10 years in Korea Soon-Hee Jung, Minseob Eom, Hyung-Ryoul Kim, Sang-Back Koh, Suk-Joong Yong, Myoung Ja Chung, Han Sun Lee, Kwang-Sun Suh, Ji Sun Song. Pathology, Yonsei University Wonja College of Medicine, Wonju, Korea Pathology, Yonsei University Wonja College of Medicine, Wonju, Korea Preventive Medicine (in which costs of radiographs are paid by industry) were compared with results of a government-funded enhanced surveillance program utilizing a mobile examination unit stationed in mining regions. Observed disease prevalence was stratified by region and by mining tenure, and compared between participants in the two programs.

Results: Overall, participants in the routine and enhanced surveillance programs were similar for participation rate, mining location (surface/underground), gender, and race/ethnicity. Participants in the enhanced program were older (47.1 vs. 36.4 yr), had longer tenure (21.8 vs. 11.4 yr), and higher prevalence of abnormal radiographs (3.9% vs. 1.9%) compared to the routine program. However, among miners with at least 20 years of mining, rates of both CWP (6.1% vs. 7.0%) and PMF (1.1% vs. 0.9%) were similar for participants in the enhanced and routine surveillance programs, respectively.

Conclusions: Tenure-specific prevalences in the routine and enhanced surveillance programs were similar, indicating that selection bias does not explain the recent increases in CWP and PMF among U.S. miners. Previous reports have implicated increased lung deposition of respirable dust and silica as explanations for the ongoing pneumoconiosis problem.

P1064 Pulmonary asbestos fiber in an urban population in Spain María-Isabel Velasco-Garcia1, María-Jesús Cruz2, Carmen Diego2, Mª Angeles Montero3, Ferran Morell1, Jaume Ferrer1.1 Pulmonology, Hospital Vall d’Hebron, Barcelona, Spain; 2Pulmonology, Hospital Arquitecto Marcídez, El Ferrol, Spain; 3Anatomopatolgy, Hospital Vall d’Hebron, Barcelona, Spain

Introduction: In this study, asbestos fibers in lung are characterized and quantified for the first time in an exposed and an unexposed Spanish population.

Material and methods: We studied samples from 47 autopsy specimens (25 unexposed subjects from Barcelona with no lung disease, and 22 asbestos-exposed subjects from El Ferrol), and 32 resected surgical specimens from lung cancer patients in Barcelona.

After eliminating organic material, the inorganic residue was analyzed by optic microscopy and electron microscopy. Results are expressed as the number of asbestos fibers or asbestos bodies counted per gram of dry lung tissue. To identify the type of fibers found, 38 samples were analyzed by scanning electron microscopy and energy dispersive x-ray analysis.

Results: 100% of the fibers identified were amphiboles (crocidolite 45%, anthophyllite 22%, tremolite 16%, amosite 15% and actinolite 3%). Among the total analyzed, 46% of asbestos fibers had a length of >5 μm and diameter of <0.2 μm.

A good correlation was found between optic microscopy and electron microscopy (r = 0.77, p < 0.0001) in the determination of asbestos fiber and asbestos body counts. There were no significant differences in asbestos fiber or body counts between patients with non-malignant conditions (asbestosis and plaques) and those with malignant disease (lung cancer and mesothelioma).

Conclusions: This study provides the first available data on the type of asbestos content in lung in the Spanish population. The exclusive retention of amphiboles was worthy of note and suggests elimination of chrysotiles following inhalation.

Optic and electron microscopy were both reliable methods for pulmonary asbestos determination in our laboratory.
P1067
Occupational and environmental determinants of exposure to asbestos in malignant mesothelioma cases
Soussan Salehpour1, Seyed Ali Azin2, Ali Cheraghi-Vandi1, Mohamad Mehdi Heidari1, Sajedeh Mir Mohammad Saadeghi1. 1Chronic Respiratory Diseases Research Center, National Research Institute of Tuberculosis and Lung Diseases, Tehran, Islamic Republic of Iran; 2Social Medicine Department, Iranian Institute for Health Sciences Research, The Academic Center for Education, Culture and Research, Tehran, Islamic Republic of Iran

Background: The relationship between pleural malignant mesothelioma and exposure to asbestos is currently known, but there is no accurate information regarding high risk occupations and types of exposure in Iran.

Aim and objectives: To identify several biochemical marker levels in mesothelioma (MM), in malignant mesothelioma cases, source of exposure to asbestos in MM patients and in healthy subjects with EAE.

Methods: In this case-control study, 64 cases with diagnosis of pleural malignant mesothelioma who were admitted in Masih daneshvari hospital between 2001 and 2009 were studied. All the cases and 56 controls participated in a telephone interview for job history and occupational and environmental exposures to asbestos.

Results: Asbestos exposed occupations in mesothelioma group included corrugated asbestos cement sheet production 11 (%17.2), Insulation 6 (%9.4), construction 6 (%9.6), asbestos warehouse 3 (%4.7), oil and gas shaft drilling 2 (%3.1) and car brake shoe manufacturing 2 (%3.1). In control group the only exposed occupation was construction 8 (%13.79). Odds Ratio calculated for occupational exposure to asbestos cement sheet production factory was the most prevalent cause for environmental exposure.

Conclusion: In%46.87 of mesothelioma cases, source of exposure to asbestos was corrugated asbestos cement sheet industry due to employment in the factory, residency in neighbourhood of the factory or use of its products.

P1068
Investigating of CEA, CA125, CA15-3, CA19-9, FT3, FT4, TSH, vitamin B12, folic acid and ferritin in malignant and benign diseases due to environmental asbestos exposure
Isa Dongel1, Mehmet Bayram2, Semseddin Sahin1, Ismail Benli1. 1Chest Disease, Sivas Numune Hospital, Sivas, Turkey; 2Chest Disease, Sivas Numune Hospital, Sivas, Turkey

Introduction: The relationship between pleural malignant mesothelioma and occupational asbestos exposure is currently known, but there is no accurate information regarding high risk occupations and types of exposure in Iran.

Aim: To identify several biochemical marker levels in mesothelioma (MM), in malignant mesothelioma cases, source of exposure to asbestos in MM patients and in healthy subjects with EAE.

Methods: 277 patients with PP from villages close to asbestos containing (serpentin asbestos) were investigated. 121 healthy workers from villages close to OU were investigated in accordance with the guidelines for the analysis of mineral fibres in biological samples set by De Vayet al., ERS Working Group. Observation period: 1/1/2008 to October 2010.

Results: 12 had pulmonary adenocarcinoma, 5 epidermoid carcinoma, 1 poorly differentiated carcinoma, 4 asbestosis, 5 mesothelioma, 2 pleural plaques and 2 had a concentration of over 1000 AB/g in dry tissue. The average AB/g was 5947 (range:249-4660599). The work history of 29 patients was collected; 27 had worked in naval shipyards. Average age at death: 67.5. A detailed work history was not collected for 8 patients. Average period of exposure: 24-21 years. 26 patients (83.8%) had been smokers with an average consumption of 26 cigarettes/day.

Conclusions: The quantification of AB in pulmonary tissue is a very useful tool to evaluate the history of exposure to asbestos. The shipyard workers from El Ferrol had a very high concentration of AB in the lung that are the cause of the pathology.