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**CHRONIC RESPIRATORY HEALTH EFFECTS IN PIG FARMERS RELATE TO OCCUPATIONAL EXPOSURE TO DISINFECTANTS, ENDOTOXINS AND AMMONIA**

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The aim was to study relationships between occupational exposure of pig farmers and chronic respiratory health effects. We conducted a cross-sectional study among 198 Dutch pig farmers, of whom 100 without and 98 with one or more chronic respiratory symptoms of cough, phlegm, wheezing, shortness of breath and asthma. Long term average exposure to dust, endotoxin and ammonia were based on personal exposure measurements taken on two days. Use of disinfectants and disinfection procedures were assessed by walk through survey and interview. Adjusted for smoking habits and age, duration of and pressure used in the disinfection procedure were strongly and positively related to chronic respiratory symptoms, e.g. OR=4.0 (95%CI 1.4-11.9) for disinfection more versus less than 10 minutes. Exposure to dust, endotoxins and ammonia were not related to chronic respiratory symptoms.

Adjusted for smoking habits, age and standing height, increase in ammonia exposure with a factor 2.72 and duration of the disinfection procedure of more than 10 minutes were statistically significantly associated with lower values for most base-line lung function parameters. The estimated effects for FEV<sub>1</sub> were 270 ml (se 130) and 440 ml (se 180), respectively. A statistically significant inverse association between base-line lung function and endotoxin exposure was observed only among asymptomatic farmers. An increase in exposure with a factor 2.72 was associated with a decrease in FVC and FEV<sub>1</sub> of 720 (se 280) and 640 ml (se 240), respectively.

Our results suggest that use of disinfectants is an important etiologic factor in chronic respiratory health effects of pig farmers. Results also suggest an etiological role for exposure to endotoxins and ammonia in development of these effects in pig farmers.

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**OCCUPATION AND PREVALENCE OF RESPIRATORY SYMPTOMS IN THE GENERAL POPULATION.**

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The aim of this preliminary study was to investigate relationships between respiratory symptoms and occupational exposures in a general population. The data were collected as part of the Monitoring Project on Risk Factors for Chronic Diseases. The unique composition of the population, both male and female and its relatively young age distribution, could provide information on respiratory health risks in various industries due to exposures from the present and recent past. The study subjects were all inhabitants of Doetinchem, a small industrial town in the eastern part of the Netherlands and come from a survey among 1104 persons conducted in 1993 and were 20-59 years old. A total of 274 cases with respiratory symptoms and 274 controls were matched for age and gender at group level. In a multivariate logistic regression analysis, adjusted for smoking and SES, working in the "construction", "glass, clay and stone", "metal", "rubber, plastics and synthetics" and "printing" industry were statistically associated with a higher prevalence of respiratory symptoms, with significant OR's ranging from 2.6 to 6.5. Because of the relatively small amount of companies involved in the "rubber, plastic and synthetics" industry the observed health effects could be supported by actual exposure data. When appropriate time periods for the industrial activities were taken into account a positive relationship was found between duration of the activities and occurrence of respiratory symptoms. Additional analysis with exposures generated by a general Job Exposure Matrix for the entire occupational history gave unsatisfactory and non interpretable results due to the limitations of the applied matrix. Therefore it is concluded that traditional methods based on surrogate and qualitative measures of exposure are no longer valid for identifying and quantifying new risks.

P039

**ISSUES ON ASSESSMENT OF EXPOSURE TO FIBROGENIC DUST**

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The principal hazard at the building plants is fibrogenic dust. The aim of the study was to detect the early markers of the occupational hazards effect. We determined the local immunity indices in saliva and glucose as stress marker.

Lysozyme activity was detected by spectrophotometric method, S IgA - according to Mancini method, heterophylus antibodies (HA) - in microprecipitation reaction with rabbit's erythrocytes. The index alteration degree (IAD) was calculated by formula.

The workers from the Riga cement factory (n=57) and control persons (n=40) were examined.

Concentration of dust and chemical substances in the air of the cement plant exceeded MAC in 45-65% of the analyses. 35% of the workers were practically healthy. Positive allergic skin tests were detected in 45% of the workers (Cr,Al,Mn); sensitization was asymptomatic. The workers had an altered indices 2-2.5 times and the III IAD 3-3.5 times as large than persons in control group. The altered indices in women were detected 1.2-1.6 times more than in men.

The longer the length of service the greater the alteration of indices. Depressed indices were observed in the first years of service but an increased ones - in the workers with the bigger length of service.

A correlation was defined between composition of the dust and state of local immunity. Asbestos dust resulted to lysis of the alveolar macrophages and atrophy of the epithelial cells at the stress background.

Used markers could serve for identification of the risk groups.

P040

**APPLICABLE BIOMARKERS IN MONITORING OF OCCUPATIONAL LUNG DISEASES**

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a) We investigated some parameters of humoral immunity (immunoglobulins of the classes A, G, M, complement components C3, C4, alpha-1-antitrypsin, and transferrin) in workers exposed to asbestos (n=44), basalt (n=38), and glass fibers (n=31) compared with a control reference group (n=35). The factor of humoral immunity were significantly stimulated mainly in subjects exposed to asbestos (statistically significantly increased levels of IgA, G, M and complement components C3, C4). Most of the examined indicators in basalt and glass fiber exposed groups differed insignificantly from the control group. Average age, mean time of exposure and smoking habits were taken into account. Radiological analysis in comparison with immunological result showed that abnormal immune parameters occurred both in radiologically negative and radiologically positive group of workers exposed to asbestos. This means that immunological processes probably preceded pathological-anatomical changes, and we suppose therefore that these parameters are applicable in epidemiological studies.

b) Our experimental animal studies suggest, that some of bronchoalveolar lavage (BAL) parameters (number of alveolar macrophages/ml of BAL, differential cell count of BAL, lactate dehydrogenase, acid phosphatase as well as cytokine -tumor necrosis factor, interferon gamma release) were influenced significantly after the exposure to asbestos and other fibrous dust. In view of these facts we assume, that these parameters could be applicable as biomarkers for testing the harmfulness of fiber dusts in occupational environment with high risk of lung injury development.