

RESPIRATORY DISEASES II: SILICA ORAL SESSION 46

140 Lung function decrease as a result of exposure to quartz containing dust in construction workers

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Background. Construction workers are exposed to high levels of quartz containing dust. Only few studies are available that describe respiratory health effects resulting from quartz dust exposure in this industry. We studied respiratory symptoms and decreases in spirometric lung function in relation to quartz dust exposure and radiological abnormalities in construction workers.

Methods. A cross-sectional study comprising respiratory symptoms and spirometric lung function testing was completed among 1335 construction workers of 30 years and older with potential exposure to high levels of quartz dust. Exposure levels were evaluated for some occupational groups, and estimated for others, based on an expert judgement. The occurrence of respiratory symptoms was recorded and spirometric lung function was measured. Results from lung function tests were compared with a Dutch reference population and associated with exposure data and the presence of radiographic abnormalities.

Results. Quartz exposure levels were high and often above existing guidelines for respirable quartz exposure. Average lung function of construction workers was lower compared with a Dutch reference population, but not when compared with European reference values. Lung function was not associated with the exposure, except for a reduction in FVC of 5 ml per year for highest exposed. Presence of radiographic changes, profusion category 1/1 and greater, which earlier appeared to be exposure related, was associated with considerable decreases in both FEV1 and FVC of 270 ml/s and 180 ml respectively.

Conclusion. The association between radiographic abnormalities and lung function and the decreased lung function compared to a reference population are suggestive of an exposure related effect, but a direct association between exposure and lung function was not detected.

141 Effect of respiratory symptoms and poor lung function on long term mortality in foundrymen

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Background. In 1964 Lloyd Davies and colleagues from the UK Factory Inspectorate measured lung function (FEV1 and FVC) in 1780 men from 67 foundries in England and Wales and in 1730 men from 60 nearby engineering factories (controls). Data were also collected on occupational history, smoking history and respiratory symptoms. A 1971 monograph by Lloyd Davies reported increased respiratory symptoms in foundrymen. Long term mortality follow up is now available (1965-1997). The new study objective is to evaluate the long term significance of changes in symptomatology and ventilatory function.

Method. Follow up details were supplied by the UK National Health Service Central Register. Expected number of deaths were calculated on the basis of male mortality rate for England and Wales, taking age and calendar year into account.

Results. Several respiratory symptoms were studied. Presence of cough for at least 3 months each year was the best predictor of mortality both from lung cancer (foundrymen: Obs 77, Exp 43.3, SMR 178, 95% CI 140 to 222; controls: Obs 60, Exp 34.4, SMR 174, 95% CI 133 to 224) and non malignant diseases of the respiratory system (foundrymen: Obs 87, Exp 48.2, SMR 180, 95% CI 144 to 222; controls: Obs 72, Exp 38.9, SMR 185, 95% CI 145 to 233). Obstructive

ventilatory defect (FEV1/VC% <75 and FVC/Predicted VC% >80) was also a good predictor of excess mortality both from lung cancer (foundrymen: Obs 56, Exp 36.8, SMR 152, 95% CI 115 to 197; controls: Obs 42, Exp 30.1, SMR 140, 95% CI 101 to 189) and from non malignant diseases of the respiratory system (foundrymen: Obs 72, Exp 43.8, SMR 164, 95% CI 129 to 207; controls: Obs 55, Exp 36.3, SMR 152, 95% CI 114 to 197). Combined ventilatory defect (FEV1/VC% <75 and FVC/Predicted VC% <80) was only a good predictor of excess mortality from non malignant diseases of the respiratory system (foundrymen: Obs 24, Exp 4.7, SMR 512, 95% CI 328 to 761; controls: Obs 20, Exp 6.0, SMR 333, 95% CI 204 to 515)

Conclusion. Respiratory symptomatology and ventilatory function have a marked influence on long term mortality.

142 Occupational silica exposure and risk of various diseases: an analysis using death certificates from 27 States

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Background. Although crystalline silica exposure is associated with silicosis, lung cancer, pulmonary tuberculosis and COPD, there is less support for an association with autoimmune disease, and renal disease.

Methods. Using data from the U.S. National Occupational Mortality Surveillance (NOMS) system, a matched case-control design was employed to examine each of several diseases. These diseases included silicosis, lung cancer, stomach cancer, esophageal cancer, chronic obstructive pulmonary disease (COPD), respiratory tuberculosis, sarcoidosis, systemic lupus erythematosus, systemic sclerosis, rheumatoid arthritis, and various types of renal disease. Cases were subjects whose death certificate mentioned the disease of interest. A separate control group for each of the diseases of interest was selected from among subjects whose death certificate did not mention the disease of interest nor any of several diseases reported to be associated with crystalline silica exposure. Subjects were assigned into a qualitative crystalline silica exposure category based on the industry/occupation pairing found on their death certificate.

Results. Those predicted to have had detectable crystalline silica exposure had a significantly increased risk for silicosis, lung cancer, COPD, respiratory tuberculosis, and rheumatoid arthritis. Although monotonic increases in disease risk with increasing crystalline silica exposure were observed for silicosis, esophageal cancer, COPD, respiratory tuberculosis, systemic sclerosis, and systemic lupus erythematosus, those postulated to have had the greatest crystalline silica exposure had a significantly elevated risk for silicosis, lung cancer, COPD, and respiratory tuberculosis only.

Conclusions. This study corroborates the association between crystalline silica exposure and silicosis, lung cancer, respiratory tuberculosis, and COPD. Finally, limited support is provided for an association between crystalline silica exposure and rheumatoid arthritis, systemic sclerosis, and systemic lupus erythematosus.

143 Occupational exposure to synthetic amorphous silica, respiratory symptoms and pulmonary function

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Background. Exposure to crystalline silica has been associated with adverse health outcomes, including silicosis and lung cancer. The impact of synthetic amorphous silica (SAS) on human health, however is undetermined. In order to assess the possible association between occu-

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