Oral Presentation
Exposure Assessment

0326 A SWEDISH JOB EXPOSURE MATRIX FOR PHYSICAL WORKLOAD

Katarina Kjellberg*, Gun Johansson, Magnus Alderling, Tomas Hemmingsson.
Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden; Centre for Occupational and Environmental Medicine, Stockholm County Council, Stockholm, Sweden; Centre for Social Research on Alcohol and Drugs, Stockholm University, Stockholm, Sweden

Background To study associations between physical workload and health outcomes, valid and feasible exposure assessment methods are needed. Physical workload can be assessed by technical measurements, observations and questionnaires. Measurements and observations are often too costly in large epidemiological studies. Response rates to surveys are decreasing. Also, self-reported exposure is prone to bias since it may be influenced by e.g. health. Alternatives are to use job exposure matrices (JEM) where each job is attributed exposure measures. This enables large epidemiological studies to be conducted on registers and cohorts that include job titles. The aim was to construct a Swedish JEM for physical workload.

Methods Data from the Swedish Work Environment Surveys conducted every second year 1997–2013, including 90 077 working Swedes, were used. The JEM was based on eight objects were included. Participant responses were used to estimate occupational lifting exposures in three ways: 1) self-reports; 2) a job exposure matrix (JEM) linking job titles with O*NET exposure data; and 3) combining 1 and 2 with Empirical Bayes Estimators (EBE).

Results The JEM provides information on physical exposures in 355 occupations, divided into men and women. Each occupation has been assigned mean values for specific exposures, e.g. heavy lifting, and overall physical exposure, as well as the proportion of workers exposed. Analyses will be presented on the predictive validity of JEM estimates on musculoskeletal disorders in a Swedish cohort.

Conclusions If the JEM is considered valid it will be a valuable tool in epidemiological studies of physical workload.
Background/Objectives We extended the mortality follow-up of a cohort of 25,460 workers employed at eight acrylonitrile-producing or using facilities in the U.S. by 21 years. Based on 8124 deaths and 1,023,921 person-years of follow-up, we evaluated the relationship between occupational exposure to acrylonitrile and mortality.

Methods Standardised mortality ratios using deaths through December 31, 2012 were calculated. Personnel records, work histories, and monitoring data were used to develop quantitative estimates of exposure to acrylonitrile. Adjusted hazard ratios (HR) were estimated by Cox proportional hazards regression.

Results All-cause mortality and mortality from all cancer was significantly less than expected compared with the general population. Internal analyses by cumulative and average exposure revealed elevated risk of cancer of the lung and bronchus (n=808 deaths) and bladder (n=55 deaths). The HR for lung cancer was significantly elevated in the highest quintile of cumulative exposure (1.40, 95% CI 1.11–1.78, p-trend=0.09) compared to unexposed workers, peaking at ≥20 years since first exposure/hire HR=1.49, 95% CI 1.17–1.91); average exposure was associated with a small non-significant increased risk (HR=1.20, 95% CI 0.95–1.52). Average exposure was associated with a significantly elevated risk of bladder cancer; workers in the top tertile had an HR=2.89, 95% CI 1.35–6.18, p-trend=0.01 compared to the unexposed, while there was non-significant increase between cumulative exposure and risk (HR=1.37, 95% CI 0.65–2.90). Significant HRs were not observed for other smoking-related outcomes.

Conclusions Extended mortality follow-up of the largest cohort of acrylonitrile exposed workers provides some evidence of a possible association between high exposure to acrylonitrile and lung and bladder cancer.

Oral Presentation

Cancer

0329 OCCUPATIONAL EXPOSURE TO METALS AND WELDING FUMES, AND RISK OF GLIOMA IN THE INTEROCC STUDY

Background Brain tumouraetiology is poorly understood. Based on their ability to pass through the blood-brain barrier, it has been hypothesised that exposure to metals may increase the risk of brain cancer. Results from the few epidemiological studies on this issue are inconsistent.

Methods We investigated the relationship between glioma risk and occupational exposure to five metals - lead, cadmium, nickel, chromium and iron- as well as to welding fumes, using data from the seven-country INTEROCC study. A total of 1800 incident glioma cases and 5160 controls aged 30–69 years were included in the analysis. Lifetime occupational exposure to the agents was assessed using the INTEROCC JEM, a modified version of the Finnish job exposure matrix FINJEM.

Results In general, cases had a slightly higher prevalence of exposure to the various metals and welding fumes than did controls, with the prevalence of ever exposed ranging from 1.7% and 2.2% for cadmium up to 10.2% and 13.6% for iron among controls and cases, respectively. However, in multivariable logistic regression analyses, there was no association between ever exposure to any of the agents and risk of glioma with odds ratios (95% confidence intervals) ranging from 0.8 (0.7–1.0) for lead to 1.1 (0.7–1.6) for cadmium. Results were consistent across models considering cumulative exposure or duration, as well as in all sensitivity analyses conducted.

Conclusions Findings from this large-scale international study provide no evidence for an association between occupational exposure to any of the metals under scrutiny or welding fumes, and risk of glioma.