Conclusions This analysis indicates that PI is a valid and reliable instrument which can be effectively used to monitor safety conditions at workplaces.

270 HEALTH AND SAFETY EXPERIENCE OF COMMERCIAL JANITORS

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Commercial janitors are an important group of low wage, largely immigrant workers who face significant potential risks at work, and yet have only been minimally studied for occupational injury and illness. Anecdotal reports from a local union representing commercial janitors in the Seattle area suggest pressures on the industry have produced a dramatic increase in workload over the past few years, raising the possibility of increased injury and illness. A cross sectional survey was designed to assess a range of exposures among commercial janitors including both union (n = 275) and non-union (n-75) sectors, and using a group of security guards (n-75) as controls. A novel participatory approach to data collection was developed, utilising workers to recruit subjects and conduct interviews in three languages, using electronic data collection tools linked to an internet-based database. Further, a novel subjective workload scale was adopted, and changes in workload and injury and illness rates over the past three years were assessed. Exposures assessed include general workload, musculoskeletal stressors, chemical use, as well as psychosocial risks such as work stress, safety climate, discriminatory management practices and work-life balance. Outcomes included acute injury, musculoskeletal pain, pulmonary and dermatological symptoms, and sleep disturbance. Initial results indicate a significant increase in workload with 28.5% reporting >7 on a 10 point scale two years ago, up to 35% in the current year. A concomitant increase in injuries was similarly observed. The paper describes the approach to data collection and describes rates of exposure and health and safety outcomes by group. Measures adopted to validate the self-reported conditions are also described.

271 CADMIUM EXPOSURE AND ANEMIA RISK IN AN ELECTROPLATING INDUSTRY AREA WITH METAL CONTAMINATION

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Background and Objective Cadmium (Cd) exposure, like Itai-itai disease, may present with erythropoietin (EPO) hypoproduction, and associated erythroid abnormalities. Anemia may be associated with toxic metal (Cd and lead) poisoning with interaction with essential trace elements (iron, zinc, copper) in humans. We aimed at assessing the relationship among erythrocyte parameters (EP), anemia (hemoglobin < 12 g/dL) and blood Cd (B-Cd) among adult residents in an environmentally high-exposed community near electroplating industry area.
Methods A total of 1,062 residents were included through stratified random sampling by three age groups (35–44, 45–54, and 55–64 years) and gender from an electroplating-related metal contaminated area located in central Taiwan during 2002~2005. B-Cd levels were measured by an ELAN 6100 inductively coupled plasma-mass spectrometer (ICP-MS). Multiple logistic regression models were used for test the association between anemia and B-Cd with serum ferritin taken into account.
Results B-Cd levels was negatively associated with the red blood cell (RBC) count, mean cell hemoglobin (MCH), and mean cell hemoglobin concentration (MCHC) (all $p<0.01$). Odds ratio (OR) of anemia was 2-fold higher (OR = 2.03, $p < 0.05$) for females with elevated B-Cd (> 1.5 μg/L) in logistic regression with adjustment for age, ferritin, estimated glomerular filtration rate, and 2-microglobulin (B2MG). Females with B-Cd > 1.5 μg/L and B2MG>80 μg/L were associated with the highest risk of anemia (OR = 6.69, $p = 0.001$) as compared to those at lower levels. We observed a positive association between log-scale B-Cd and hemoglobin among female with serum ferritin ≧ 50μg/L.
Conclusions Our findings suggest that low Cd exposure from environmental contamination may have negative impacts on RBC indices, particularly among females. We hypothesised that Cd might induce erythrocyte dysfunction locally on peritubular interstitial cells of renal cortex responsible for EPO production possibly through iron-related oxidative stress. Further studies are needed to elucidate the pathophysiologic mechanism between Cd interacting with body iron on erythropoiesis.

Session: 9. Asbestos and mesothelioma

272 ESTIMATING HEALTH EFFECTS OF ASBESTOS EXPOSURE IN THE CONSTRUCTION INDUSTRY

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Objectives The use of asbestos in the construction industry stopped in mid 1970s in Sweden, but is still in use in some countries. The exposure may vary depending on time, country and occupation. We studied the occurrence of malignant pleural mesothelioma as a marker of asbestos exposure and compared it to the workers own estimation of asbestos exposure.
Methods The incidence of malignant pleural mesothelioma was studied among men in a Swedish cohort (N = 367,568) between 1972 and 2009. They reported the exposure to asbestos in early 1970s during a health examination.
Results Insulators and plumbers had the highest incidences (39 and 16 cases per 100,000 person-years respectively) and constituted 21% of all cases. Electricians and sheet metal workers had and incidence around 10 cases per 100,000 persons-years, while concrete workers and wood workers had an incidence of around 5 cases per 100,000 person-years. The correlation was poor between the incidences and reporting any previous exposure to asbestos among men in these occupations, e.g. in the early 1970s only 7% of the concrete workers but 50% of the wood workers reported any previous exposure to asbestos. The corresponding figure for insulators was 34%.
Conclusions The study shows that construction workers constituted a considerable proportion of the malignant pleural mesotheliomas in Sweden (30–40% in 2000–2009). The analysis indicates that many workers were unaware of their exposure to asbestos. Reports of previous asbestos exposure from workers in this industry are uncertain measures of exposure which is