

**Method** Using medical surveillance data, hospital admission of nervous system disease (G00-G99) from 2000 to 2005 was analysed in cohort contained manganese exposed male workers (438,693 person years). Also, 2% of Korean men was randomly selected and analysed their hospital admission data. Standardised Admission Ratios (SAR) of nervous disease among manganese exposed workers was estimated reference to Korean men.

**Results** For 6 years, 500 admissions with nervous system diseases (G00-G99) were observed in solvents exposed workers. SARs for overall nervous diseases (G00-G09) (SAR=1.24, 95% CI 1.13–1.35), inflammatory disease of CNS (G00-G09) (SAR=1.92, 95% CI 1.52–2.39), other degenerative diseases of nervous system (G31) (SAR=3.60, 95% CI 1.16–8.40) and nerve, nerve root and plexus disorders (G50-G59) (SAR=1.66, 95% CI 1.36–2.00) were significantly higher than those of Korean men. SAR of extrapyramidal and movement disorders (G20-G26) was significantly high (SAR=2.03, 95% CI=1.05–3.55) among workers with 10 and more years employment duration.

**Conclusions** This manganese exposed workers' cohort with short follow-up periods exhibits significantly elevated admission with overall and some kinds of nervous disease comparing to Korean men. Especially, increased SAR of extrapyramidal and movement disorder suggests relatedness of manganese exposure.

#### 0090 MAGNETIC FIELD EXPOSURES AND BRAIN TUMOUR AND LEUKAEMIA RISKS IN UK ELECTRICITY GENERATION AND TRANSMISSION WORKERS, 1973–2010

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**Objectives** To investigate whether brain tumour or leukaemia risks are related to occupational exposure to low-frequency magnetic fields.

**Method** Brain tumour and leukaemia risks experienced by 73 051 UK electricity supply industry workers were investigated for the period 1973–2010. All employees were hired in the period 1952–1982 and were employed for at least six months with some employment in the period 1973–1982. Detailed calculations had been performed to assess exposures to magnetic fields. Poisson regression was used to calculate relative risks (rate ratios) of developing a brain tumour (or glioma or meningioma) or leukaemia (or its sub-types) for categories of lifetime, distant (lagged) and recent (lagged) exposure.

**Results** Findings for gliomas, all brain tumours combined, and all leukaemia were unexceptional; risks were close to (or below) unity for all exposure categories. There were no significant dose-response effects shown for meningioma, but there was some evidence of elevated risks in the three highest exposure categories for distant exposures. There were no significant dose-response effects shown for the main leukaemia sub-types, but there was a significant positive trend for acute lymphocytic leukaemia (ALL). National comparisons indicated that the limited associations shown for meningioma and ALL were based, in the main, on unusually low risks in the lowest exposure category.

**Conclusions** The findings are consistent with the hypotheses that both distant and recent magnetic field exposures are not causally related to gliomas or to the main leukaemia sub-types. The limited positive findings for meningioma and ALL may be chance findings; national comparisons argue against a causal interpretation.

#### 0091 INFLAMMATORY MARKERS AND EXPOSURE TO AIR POLLUTANTS AMONG WORKERS IN A SWEDISH PULP AND PAPER MILL

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**Objectives** Study the relationship between inhalation of airborne particles in a pulp and paper mill and markers of inflammation and coagulation in blood.

**Method** Personal sampling of inhalable dust was performed for 72 subjects working in a Swedish pulp and paper mill. Stationary measurements were used to study different particle size fractions including respirable dust, PM<sub>10</sub>, PM<sub>2.5</sub>, the particle surface area and particle number concentrations of ultrafine particles. Markers of inflammation such as interleukins (IL-1b, IL-6, IL-8, and IL-10), C-reactive protein (CRP), serum amyloid A (SAA), and fibrinogen and markers of coagulation such as factor VIII, von Willebrand factor vWF), plasminogen activator inhibitor (PAI-1), and D-dimer were determined before the first shift after a work free period of normally five days and after the first, second and third shift

**Results** The average 8hr-TWA level of inhalable dust in was 0.30 mg/m<sup>3</sup>, range 0.005–3.3 mg/m<sup>3</sup>. The proxies for 8hr-TWAs of respirable dust was 0.045 mg/m<sup>3</sup>, PM<sub>10</sub> 0.17 mg/m<sup>3</sup> and PM<sub>2.5</sub> 0.08 mg/m<sup>3</sup>. No significant increase of markers of inflammation or coagulation in blood during the working week was noted after a non-exposure period of five days. In a multiple regression analysis adjustments were made for sex, age, smoking, BMI, and blood group. Significant positive correlations were found between several particle exposure metrics and CRP, SAA and fibrinogen taken pre- and post-shift day 1, suggesting a dose-effect relationship.

**Conclusions** These relations between particle exposure and inflammatory markers may indicate an increased risk of cardiovascular disease.

#### 0094 BLADDER CANCER INCIDENCE AMONG WORKERS EXPOSED TO O-TOLUIDINE, ANILINE AND NITROBENZENE AT A RUBBER CHEMICAL MANUFACTURING PLANT

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**Objectives** An earlier investigation found increased bladder cancer incidence among workers at a rubber chemical manufacturing plant that used o-toluidine, aniline and nitrobenzene. The cohort was expanded to include additional workers (n = 1875) and updated through 2007 to assess bladder cancer with improved exposure characterisation.

**Method** Work histories were updated and exposure categories and ranks were developed for o-toluidine, aniline and nitrobenzene combined. Incident cancers were identified by linkage to six state cancer registries. Residency in time-dependent cancer