MAGNETIC FIELD EXPOSURES AND BRAIN TUMOUR INCIDENCE AMONG WORKERS

Results

For 6 years, 500 admissions with nervous system diseases (G00-G09) 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.

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) and rank correlations were used to study associations.

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.

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_{10}, PM_{2.5}, the particle surface area and particle number concentrations of ultrafine markers. Markers of inflammation such as interleukins (IL-1β, 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/m³, range 0.005–3.3 mg/m³. The proxies for 8hr-TWAs of respirable dust was 0.045 mg/m³, PM_{10} 0.17 mg/m³ and PM_{2.5} 0.08 mg/m³. 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.

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
registry catchment areas was determined. Standardised incidence ratios (SIR) and standardised rate ratios for bladder cancer were calculated by exposure category and cumulative rank quartiles for different lag periods. Cox regression was used to model bladder cancer incidence with estimated cumulative rank, adjusting for confounders. Indirect methods were used to control for smoking.

**Results** Excess bladder cancer was observed compared to the New York State population (SIR=2.87, 95% confidence interval [CI] 2.02–3.96), with higher elevations among workers definitely exposed (moderate/high) (SIR=3.90, 95% CI 2.57–5.68) and in the highest cumulative rank quartile (SIR=6.13, 95% CI 2.80–11.6, 10-year lag). Bladder cancer rates increased significantly with estimated cumulative rank (10-year lag). Smoking only accounted for an estimated 8% elevation in bladder cancer incidence.

**Conclusions** Bladder cancer incidence remains elevated in this cohort and significantly associated with estimated cumulative exposure. Results are consistent with earlier findings in this and other cohorts. Despite other concurrent chemical exposures, we consider o-toluidine most likely responsible for the bladder cancer incidence elevation and recommend a reexamination of occupational exposure limits.
0094 Bladder cancer incidence among workers exposed to o-toluidine, aniline and nitrobenzene at a rubber chemical manufacturing plant
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*Occup Environ Med* 2014 71: A9-A10
doi: 10.1136/oemed-2014-102362.29

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