Background A systematic review of the associations between occupational chemical exposures and cardiovascular diseases has been performed under management of Swedish Agency for Health Technology Assessment and Assessment of Social Services (SBU).

Methods Inclusion criteria: (i) epidemiology publication in English in peer-reviewed journal between 1970 and 2016, (ii) cohort studies with at least 50 exposed participants or case-control studies with at least 50+50 participants. Relevance and quality were assessed using predefined criteria. Level of evidence was assessed using the GRADE system. Consistency of findings was examined for a number of confounders and regarding the healthy worker effect when possible.

Results More than 8000 abstracts were screened. 162 articles of high or medium high scientific quality were finally included. There was moderately strong evidence (grade 3 out of 4) for a relationship between silica dust, engine exhaust and welding and IHD incidence. Limited evidence (grade 2) was found for arsenic, benz(a)pyrene, lead, dynamite, carbon disulphide, carbon monoxide, cutting fluids, TCDD, asbestos and tobacco smoke in the work environment. Results for stroke, cor pulmonale and high blood pressure will also be reported.

Conclusions This review identified several established associations, some less established and many knowledge gaps including lack of studies on women. Many chemical exposures have not been studied epidemiologically and there is often a shortage of exposure estimates, particularly concerning intensity and long-term exposure. A comprehensive risk analysis of chemical exposures must use social, environmental and experimental results as well.

Oral Presentation

Cardiovascular Disease

0360 OCCUPATIONAL EXPOSURE TO RESPIRABLE SILICA DUST IN MEN AND WOMEN AND RISK FOR ACUTE MYOCARDIAL INFARCTION

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10.1136/oemed-2017-104636.295

Respirable silica dust is a common and serious occupational hazard to workers' health. Inhalation causes inflammation which is a risk factor for cardiovascular disease, but few studies have confirmed a relationship. In the present study, we have investigated the risk of myocardial infarction in workers exposed to respirable silica dust, as well as differences in sensitivity based on gender.

The cohort consists of manual workers in the Swedish National Census in 1980 with information on demography and occupation (1960–1990). Information on hospital admissions for acute myocardial infarction and cause of death were obtained from nation-wide registers. A job-exposure matrix

was used to assess lifetime occupational exposure. No smoking data was available.

Among manual workers ever exposed to respirable silica dust, the hazard ratio (HR) for acute myocardial infarction was 1.29 (95% Confidence Interval (CI) 1.15–1.46) for women, and 1.02 (95% CI 1.00–1.04) for men, respectively. In the highest quartile of cumulative exposure the HR was 1.66 (95% CI 1.27–2.18) for women, and 1.06 (95% CI 1.03–1.10) for men, respectively. We found a dose-response relationship between exposure and disease. The population etiologic fraction of disease for women was 11%. In absolute numbers this corresponds to 7 extra cases/10000 person years among exposed women in the highest exposed group.

In conclusion, occupational exposure to respirable silica dust was in this study related to an increased risk for acute myocardial infarction in women, indicating a slightly increased sensitivity of the exposed women.

Oral Presentation

Cancer

0361 A 49 YEAR FOLLOW-UP OF MORTALITY IN THE BRITISH RUBBER INDUSTRY

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10.1136/oemed-2017-104636.296

Rubber workers in Great Britain were historically exposed to various carcinogenic substances, including β -naphthylamine, which was removed from industrial processes in 1949. The Health and Safety Executive (HSE) initiated in 1967 a prospective occupational cohort study of British rubber industry workers, including men 35 years of age and older, to examine cancer mortality (n=40 867, representing 381 factories). Findings from a 10 year follow-up of that cohort suggested excess mortality from cancers of the bladder, lung, and stomach, which differed by exposure to naphthylamines, as well as by industry sector and job code.

The purpose of this analysis is to extend mortality follow-up through to 2015, allowing an assessment of cancers in older ages and with longer latency periods. As well as headline Standardised Mortality Ratios (SMRs) for the cancer subtypes previously investigated, we will present mortality risks for a range of causes including leukaemia, multiple myeloma, circulatory and respiratory diseases. We will use England and Wales reference rates to compare mortality by employment duration and sector in the rubber industry. Preliminary analysis of a majority subset of the cohort (n=34,595) to 2015 identified an elevated all cause SMR of 1.11 (95%CI 1.10–1.12). More detailed results from this multi-decade follow-up of workers from rubber manufacturing will provide valuable insights into cancer mortality risks for exposed occupational populations, both in the UK and elsewhere.

Oral Presentation Risk Assessment

0362 RISK OF PLEURAL MM AND RESIDUAL ASBESTOS BURDEN IN THE LUNG: A RETROSPECTIVE CASE-CONTROL STUDY

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10.1136/oemed-2017-104636.297

Introduction Results of Malignant Pleural Mesothelioma (MPM) occurrence (mortality and incidence) by cumulative exposure dose clearly showed a proportional relation of MPM risk with dose, confirmed among studies by fibre burden. We evaluated the association between residual fibre content and MPM risk by circumstance of asbestos exposure.

Methods and materials Lung samples obtained from pleuro-pneumonectomies or autopsies (349 MPMs, and 41 controls) among subjects investigated for probability and circumstance of asbestos exposure were examined through Scanning Electron Microscopy; 291 cases had an occupational asbestos exposure, 38 MPMs a non-occupational exposure (familiar or environmental), whereas among 20 MPM an asbestos exposure was not identified. The MPM risk was evaluated by means of Odds Ratio (OR).

Results The residual asbestos fibre burden was higher among MPMs occupationally exposed (Geometric Mean:2.10 Million fibres/gram of dried tissue; 95% CI:1.5–2.58) in comparison with non-occupational (GM:0.66 Mff/gdt; 95% CI:0.47–0.95) or with unknown exposures (GM:0.59 Mff/gdt; 95% CI:0.34–1.03) and controls (GM:0.26 Mff/gdt; 95% CI:0.20–0.34). Among occupationally exposed, the MPM risk increased according to the asbestos fibre burden reaching an OR of 36.8 (95%CI:11.9–113.5) for concentrations higher than 1 Mff/g dt, compared to the reference level (<0.25 Mff/gdt). Higher ORs were observed at any concentration of amphibole fibres in comparison those for chrysotile fibres.

Conclusions The MPM risk was strongly associated to the residual asbestos fibre lung burden. The MPM risk due to non-occupational exposure shows a magnitude comparable with that with unknown asbestos exposures. The residual lung burden of chrysotile is strongly influenced by clearance and time since exposures ceased.

Oral Presentation Other

0363 OCCUPATIONAL EXPOSURE TO HIGH FREQUENCY ELECTROMAGNETIC FIELDS AND RISK OF BRAIN TUMOURS IN THE INTEROCC STUDY

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10.1136/oemed-2017-104636.298

Introduction The International Agency for Research on Cancer classified radiofrequency (RF) electromagnetic fields (EMF) as *possibly carcinogenic* based on limited evidence in human studies of cell phone use and in animal experiments, while occupational evidence was found *inadequate* due in part to limitations in exposure assessment. This study assesses possible associations between occupational exposure to RF or intermediate frequency (IF) EMF in INTEROCC participants using novel exposure assessment methodologies.

Methods A plausible index of cumulative exposure to RF and IF EMF was calculated using a source-exposure matrix and detailed interviews on work with or nearby EMF sources, both overall and in specific exposure time windows. Conditional logistic regression was used to investigate associations with glioma and meningioma risk.

Results Only ~10% (n=769) of participants (n=7,330) were ever exposed to RF and ~1% (n=44) to IF EMF sources. Overall, there was no positive association between exposure to