

and any disease were 10.4%, 2.5%, 8.5%, 1.5%, and 1.3%, respectively. Occupational injury was found as a significant factor for developing psychiatric disorders within one year after the target injury.

Conclusion The incidence rate of developing any psychiatric disorders was higher in patients after occupational injury than those after non-occupational injury and any medical condition. Further investigations are warranted to identify risk factors for psychiatric disorders following occupational injuries.

Session: 16. Lung cancer

304 LUNG CANCER RISK AMONG HAIRDRESSERS - A POOLED ANALYSIS OF CASE-CONTROL STUDIES CONDUCTED BETWEEN 1985 AND 2010

¹A O Olsson, ¹Xu, ¹Schüz, ¹Vlaanderen, ²Kromhout, ²Vermeulen, ²Peters, ³Pesch, ³Brüning, ¹Straif, ⁴And the SYNERGY Study Group. ¹International Agency for Research on Cancer, Lyon Cedex 08, France; ²Institute for Risk Assessment Sciences, Utrecht, The Netherlands; ³Institute for Prevention and Occupational Medicine of DGV, Bochum, Germany, France

10.1136/oemed-2013-101717.304

Objectives Increased risk of lung cancer has been observed among hairdressers mostly in studies that did not adjust for smoking as a confounder; the objective of the present study was to evaluate this in the SYNERGY project while adjusting for smoking.

Methods SYNERGY consists of 16 pooled case-control studies conducted in Europe, Canada, China and New Zealand between 1985 and 2010. Lifetime occupational and smoking information was collected through interviews from 19,369 cases of lung cancer and 23,674 matched populations or hospital controls. Hairdressers were identified using the ISCO codes 5–70.20 (women's hairdresser) and 5–70.30 (men's hairdresser/barber). Odds ratios (ORs) and 95% confidence intervals (95% CI) of lung cancer risk were estimated using unconditional logistic regression.

Results Overall, 170 cases and 167 controls ever worked as hairdresser or barber. The ORs for lung cancer in male hairdressers/barbers were 1.04 (95% CI: 0.79, 1.37) before adjustment for smoking and 0.91 (95% CI: 0.66, 1.25) after, and did not change markedly with regard to the time of employment. The ORs in women were 1.65 (95% CI: 1.16, 2.35) before adjustment for smoking and 1.12 (95% CI: 0.75, 1.68) after; although women employed before 1954 experienced an increased lung cancer risk also after adjustment for smoking (OR 2.66, 95% CI: 1.09, 6.47). Smoking habits differed in female hairdressers vs. non-hairdressers, while there was no significant difference in smoking habits between male hairdressers/barbers and non-hairdressers/barbers.

Conclusion Our results suggest that most findings of increased lung cancer risk among hairdressers are likely due to smoking behaviour among this occupational group and not directly related to occupational exposure.

305 ENGINE EXHAUST EXPOSURE AND LUNG CANCER RISK IN FARMING

¹S Tual, ²Silverman, ²S Koutros, ²Blair, ³Sandler, ¹Lebailly, ²Andreotti, ³Hoppin, ²Beane Freeman. ¹INSERM, UMR1086-Cancers et Préventions, Caen, France; ²Occupational And Environmental Epidemiology Branch, DCEG, NCI, Rockville, MD, United States of

America; ³Epidemiology Branch, National Institute of Environmental Health Sciences, Research Triangle, NC, United States of America

10.1136/oemed-2013-101717.305

Objectives Farmers have lower lung cancer rates than the general population, due to lower rates of smoking and possibly exposure to endotoxins. Farmers do, however, have exposure to potential lung carcinogens such as diesel exhaust from the operation of diesel-powered equipment. Using data from the Agricultural Health Study (AHS), a US-based prospective cohort study, we evaluated the risk of incident lung cancer from enrollment (1993–1997) to 2008 in relation to farm equipment use. Methods. Information on farm equipment use was obtained by self-report at study enrollment. There were 233 lung cancers among male farmers and 133 among spouses. Relative risks (RR) were estimated using Poisson regression controlling for lifestyle (including smoking) and agricultural factors. Analyses were stratified by exposure to other agricultural exposures and histological subtypes. Results. Overall, there was no significant association between any type of farm equipment and lung cancer risk but we observed a nonsignificant effect of daily driving diesel tractors for adenocarcinomas (RR = 1.95, 95% CI: 0.92–4.10). A significant interaction between driving diesel tractors and exposure to animals was also observed for this subtype in farmers (nonexposed to animals: RR = 5.75, 95% CI: 2.17–15.28, exposed: RR = 0.94, 95% CI: 0.34–2.57, p-interaction = 0.04). A similar effect modification for driving diesel tractors was observed in spouses for lung cancer overall (nonexposed to animals: RR(≥monthly vs less than monthly) = 2.25, 95% CI: 1.15–4.43, exposed: RR = 0.42, 95% CI: 0.15–1.20, p-interaction = 0.01). Although the interaction was nonsignificant for adenocarcinomas in spouses (p = 0.37), the magnitude of risk was similar (nonexposed to animals: RR = 2.77, 95% CI: 1.05–7.31). Conclusion. These findings suggest that use of diesel-powered farm equipment may increase lung cancer risk in people working in agricultural settings among those not exposed to animals, exposure that has been previously inversely related to lung cancer risk, possibly due to endotoxins. Further efforts are needed to refine the exposure assessment for diesel exhaust fumes in low and chronically exposed populations.

306 LUNG CANCER AND CLEANING-RELATED EXPOSURES: RESULTS FROM TWO CASE-CONTROL STUDIES

D V Vizcaya, Lavoue, Pintos, Richardson, Siemiatycki. CRCHUM, Montreal, Canada

10.1136/oemed-2013-101717.306

Objectives To evaluate the association between lung cancer and cleaning-related exposures.

Methods Two case-control studies conducted in Montreal to explore occupational associations with cancer included 2016 lung cancer cases and 2001 population controls. Occupational exposure to several agents was assessed using a combination of subject-reported job history and expert assessment. Participants also provided information on personal characteristics such as smoking and medical history. Using multivariate logistic regression analyses, we evaluated the associations between lung cancer and employment in 12 cleaning-related occupations, and exposure to eight chemicals related to cleaning products. For the most recent study, we analysed the effect of cleaning agents on lung cancer risk separately for asthmatics and non-asthmatics.

Results The general pattern of results was similar in both studies. Pooling the studies, we found no increased risk of lung cancer for cleaning-related occupations (odds ratio and 95% confidence interval (OR) for “ever employed in any cleaning-related occupation”: 1.0; 0.8–1.1) as compared to never cleaners. Among chemical exposures, we found a negative association of lung cancer with any occupational exposure to cleaning agents (OR: 0.9; 0.7–1.0), and biocides (0.8; 0.7–1.0). In a secondary analysis, restricting to subjects with a history of asthma, the OR between lung cancer and long duration employment in a cleaning-related occupation was 2.1 (0.9 to 5.0). The OR of lung cancer and cleaning agents was also higher, yet non-significant, among asthmatics (1.5; 0.8–2.8) than among non-asthmatics (0.9; 0.7–1.1).

Conclusions People employed in cleaning-related occupations or who had worked with cleaning agents had no increased risk of lung cancer. There was a suggestion that this overall result masked a possible increased risk of lung cancer among asthmatics with cleaning-related exposures and/or occupations.

307 OCCUPATIONAL EXPOSURE TO PAH AND LUNG CANCER RISK IN THE SYNERGY PROJECT

¹N G Guha, ¹Olsson, ²Vermeulen, ²Kromhout, ²Almansa Ortiz, ¹Vlaanderen, ³Pesch, ³Brüning, ¹Schüz, ¹Straif. ¹IARC, Lyon, France; ²Institute for Risk Assessment Sciences (IRAS), Utrecht University, Utrecht, The Netherlands; ³IPA, Ruhr, Germany

10.1136/oemed-2013-101717.307

Objectives To evaluate the association between occupational exposure to polycyclic aromatic hydrocarbons (PAH) and the risk of lung cancer, adjusted for tobacco smoking, in the SYNERGY project.

Methods The SYNERGY project pools data from 16 case-control studies conducted in Europe, Canada, China and New Zealand between 1985 and 2010. Lifetime occupational and smoking information was collected through interviews from 19,369 cases of lung cancer and 23,674 matched population or hospital controls. PAH exposure was estimated using a quantitative general population job-exposure matrix (‘SYNJEM’) based on five-digit ISCO-68 codes (4021 cases, 4077 controls ever exposed). Odds ratios (ORs) and 95% confidence intervals (95% CI) of lung cancer risk were estimated using unconditional logistic regression models adjusted for age, sex, study centre, smoking behaviour, and ever employment in an occupation with known lung cancer risk.

Results We observed a modest increased risk of lung cancer associated with occupational exposure to PAHs according to various exposure metrics (ever/never, duration, cumulative dose, time since last exposure). The odds ratio (OR) for ever exposure to PAH was 1.09 (95% CI, 1.04–1.15) overall, 1.08 (95% CI, 1.02–1.15) among men and 1.20 (95% CI, 1.05–1.38) among women. These results are further supported by significant exposure response-relationships (p-value for trend < 0.05 for years of employment and cumulative exposure [(BaP) g/m³-years]). When stratified by histological subtype, increased risks and positive exposure response-relationships were apparent only for squamous cell carcinoma and small cell lung cancer.

Conclusions Our pooled analysis suggests that occupational exposure to PAH is associated with a modest increase in the risk of lung cancer, after adjustment for tobacco smoking and exposure to other occupational lung carcinogens.

308 LUNG CANCER AND EXPOSURES IN A REANALYSIS OF BRITISH COKE WORKERS

G Miller, Cherrie, Doust. *Institute of Occupational Medicine, Edinburgh, United Kingdom*

10.1136/oemed-2013-101717.308

Objectives Workers in coke ovens are potentially exposed to polycyclic aromatic hydrocarbons (PAHs), and studies have variously shown increased lung cancer risks. A study of two British company cohorts (NSF & BSC), defined in 1967, reported in 1991 on a 20-year mortality follow-up of over 6,500 workers.

Analyses of mortality risks and exposures showed some statistically significant exposure-response relationships, as did analyses characterising exposure by time worked on coke oven tops. Limitations of the exposures were documented: notably, exposures to BSM were estimated only up to the start of follow-up (1967); and the exposures calculated made no allowance for cancer latency (time elapsing between exposure and increase in risk). The present reanalysis project was designed to bypass those limitations.

Methods Revised exposures to the general class of benzene-soluble materials (BSM) and to the specific marker benzo[a]pyrene (B[a]P) were calculated from work histories up to 1976, as were estimates of time worked on oven tops. Lung cancer mortality was analysed using Cox regression models, with time-dependent exposures lagged by 10 years to allow for latency.

Results Most results were not statistically significant. There were no significant trends with continuous measures of exposure to either BSM or B[a]P or of time worked in ovens job locations. With grouped exposures, at NSF, the highest category of B[a]P exposure had a statistically significant relative risk of 1.51. In BSC, the relative risk coefficient for working 5 or more years there was 1.81, which was statistically significant (but lower than the equivalent value of 2.10 from the previous analyses).

Conclusions These results showed some signs consistent with an effect of coke ovens work on lung cancer risk, but there was little firm evidence of any real effect.

309 LUNG CANCER AND EXPOSURE TO SILICA AND CEMENT DUSTS: THE ICARE

¹F G Guida, ²Sanchez, ³Menvielle, ²Lamkarkach, ²Cénée, ³Cyr, ⁴Févotte, ³Luce, ²Stücker. ¹INSERM, Villejuif Cedex, France; ²INSERM U1018 Team 6, Villejuif, France; ³INSERM U1018 Team 11, Villejuif, France; ⁴UMRESTE - Université Claude Bernard, Lyon, France

10.1136/oemed-2013-101717.309

Objectives This work aims at assessing the risk of lung cancer associated with exposures to silica and cement dusts, which are among the most frequent occupational exposures for construction workers.

Methods ICARE is a large multicentre population-based case-control study conducted between 2001 and 2006 in 10 French départements with a general cancer registry. Complete occupational history was collected. The subjects' exposures to silica and cement dusts were determined using two Job-Exposure Matrices (JEM) specific for these substances. We used unconditional logistic regression adjusted for age, department, number of job periods, lifelong cigarette smoking, and asbestos exposure (assessed using a third JEM).

Results Analyses were conducted among men (1885 cases, 2368 controls) and concerned 18788 jobs. We found significant