

−4.4% (95% CI: −6.8, −2.0) per year was observed. A large variation in risk was observed with the incidence for the highest risk occupation, ‘launderers, dry cleaners and pressers’, being more than 50 times the average of all other occupations. A high QSAR asthma hazard index was found in agents which were likely sensitizers.

Conclusion The data highlight a number of occupations at increased risk of adverse respiratory outcomes attributed to cleaning agents. Chemical features of the cleaning agents helped distinguish between sensitizing and irritant agents.

Poster Presentation

Occupational Medicine (SCOM/Modernet)

0132 IMMUNOLOGICAL HAZARDS IN ENGINEERED NANOMATERIAL HANDLING WORKERS

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Based on our previous study, we found that allergic dermatitis was a prominent presentation in worker with engineered nanomaterials (ENMs) exposure. The objective of this study was to disclose the plausible immunological mechanism of allergic diseases in ENMs handling workers. We investigated 14 ENMs factories with 227 exposed workers and 137 non-exposed controls in Taiwan. We used questionnaire to collect exposures severity and probability scores and group the risk level (1 to 4) of each worker. The greater the risk level (RL), the higher the severity of nanomaterial toxicity and/or the higher the exposure probability. We found the distribution of characteristics in months of work ($p=0.05$), gender ($p<0.01$), education ($p=0.001$), smoking ($p=0.001$) and alcohol drinking ($p=0.011$) differed significantly between RL and control group. The LnIgE values among characteristics of study population showed the younger age ($p<0.01$) and male ($p=0.034$) had higher LnIgE values. After adjusted the confounders in multiple linear regression models, our results demonstrated that increased LnIgE values was significantly associated with RL2 ($p=0.048$), months of works above 42 months ($p=0.008$), CNT exposure ($p=0.047$) and nano-SiO₂ exposure ($p=0.034$).

To our best knowledge, our study was the first study between ENMs exposure and immune responses in human. Our study highlighted that serum LnIgE values and exposure probability scores could have a positive association in the ENMs exposed worker. Moreover, the worker who exposed to CNT and nano-SiO₂ might be more susceptible to IgE mediated allergic problems, like allergic dermatitis in our study population.

Oral Presentation

Respiratory

0133 ENVIRONMENTAL AND OCCUPATIONAL TRIGGERS OF COPD SYMPTOMS: A CASE CROSSOVER STUDY

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Introduction This study investigated the hypothesis that common occupational and environmental chemical exposures with known irritant or sensitizing properties trigger exacerbations for patients with chronic obstructive pulmonary disease (COPD).

Methods We conducted a case crossover study in 168 COPD patients who were members of a disease management group (DMG) in central Massachusetts. Participants completed a baseline health survey and several short exposure surveys. Exposure surveys were administered by a nurse when a participant telephoned to report an exacerbation (case periods) and at a maximum of 3 randomly identified control periods when they were not experiencing an exacerbation. We compared exposures in the week preceding an exacerbation with exposures in normal (non-exacerbation) weeks. The questionnaire assessed short-term (one week) home, community and workplace activities and exposures that may be associated with COPD exacerbation.

Result Self-reported exercise was protective (OR=0.59 95% CI: 0.35–1.00). Among the chemical exposures, car and truck exhaust (OR=4.36, 95% CI: 1.76–10.80) and use of scented laundry products (OR=2.69, 95% CI: 1.31–5.52) showed strong positive effects. Self-reported respiratory infections were strongly associated with COPD exacerbation (OR=7.90, 95% CI: 4.29–14.50). Variations in outdoor temperature were associated with COPD exacerbation risk (moderate versus cold temperature OR=1.95, 95% CI: 0.26–0.70).

Discussion These results suggest that some environmental chemical exposures may play a role in triggering COPD exacerbations. If confirmed, they may provide useful guidance for COPD patients to better manage their diseases.

Oral Presentation

Methodology

0134 WHAT TO EXPECT FROM YOUR EXPECTED

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Objectives Epidemiologists often compare the observed number of deaths in a cohort to the expected number obtained by

multiplying person-time accrued in the cohort by mortality rates for a reference population (ideally, a reference that represents the mortality rate in the cohort in the absence of exposure). However, if exposure is hazardous then this calculation will not consistently estimate the number of deaths expected in the absence of exposure. This is because exposure will have affected the distribution of person-time observed in the study cohort.

Methods This talk describes a simple way to consistently estimate the expected number of deaths and illustrates the approach using data from a cohort study of mortality among underground miners. In addition, the talk considers use of these simple counterfactual-based methods for calculation of years of life lost and demonstrate how this clarifies interpretation of results.

Results In a cohort of 3254 white male miners followed from 1960 through 2005, the observed number of deaths was 2428. A standard SMR calculation yields an estimate of 1693 expected deaths (SMR=1.4;95% CI: 1.4, 1.5). The proposed counterfactual approach yields 2167 expected deaths (CMR=1.1; 95% CI: 1.1, 1.2). However, the effect of the exposure is reflected by evidence of life shortening.

Conclusions The proposed approach yields more interpretable estimates of excess deaths and years of life lost.

Oral Presentation

Exposure Assessment

0135 DEVELOPMENT OF CAREX SYSTEMS IN LATIN AMERICA AND THE CARIBBEAN

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Objectives To describe the process of building CAREX research capacity in Latin America and the Caribbean (LAC).

Methods In LAC, CAREX projects were previously developed in Costa Rica, Nicaragua, Panama, and Colombia based on adaptations of the European model. CAREX Canada recently engaged in a capacity development project to assist more local teams to implement the CAREX tool for their contexts, and to develop methods to prioritise carcinogens for assessment. Over a dozen LAC countries participated in a workshop describing the CAREX approach, knowledge translation, and applications of CAREX data in occupational cancer research. A detailed technical guide was prepared on CAREX methods and how they can be adapted. A network has been established to provide ongoing assistance to LAC countries currently developing CAREX projects.

Results Some of the key challenges identified by local partners are a lack of exposure measurement data, establishing appropriate proportion exposed values, and obtaining detailed labour force data. There is an opportunity to develop novel

methods to incorporate informal workers in exposure estimates, advancing upon what has been done in Central American CAREX projects. Countries with similar industrial composition, occupational carcinogen exposures, and/or worker demographics are collaborating on their national CAREX initiatives. New CAREX projects are underway in Peru and the Caribbean and Southern Cone.

Conclusions International collaboration has fostered the development of CAREX in LAC, where improved surveillance of occupational carcinogen exposures represents an important avenue for cancer prevention.

Poster Presentation

Cancer

0136 BREAST CANCER RISK ASSOCIATED WITH NIGHT SHIFT WORK: WHAT ARE THE META-ANALYSES TELLING US?

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Objectives To compare results and assess the quality of recently published meta-analyses of night shift work and breast cancer risk.

Methods A comprehensive search was conducted for English or French-language meta-analyses published from 2010–2017 that included at least one meta-risk estimate (mRE) for breast cancer associated with any night shift work exposure metric and that were accompanied by a systematic literature review. mREs from each meta-analysis were ascertained and organised by various study characteristics. Assessments of heterogeneity and publication bias were also extracted. An eight-point checklist was used to evaluate quality.

Results Seven meta-analyses, published from 2013–2016, collectively included 30 cohort and case-control studies spanning 1996–2016. Five meta-analyses scored ≥ 6 points on the quality assessment checklist. Of these, mREs for ever/never night shift work exposure ranged from 1.15 (95% confidence interval [CI]: 1.05–1.25, n=9 studies) to 1.40 (95% CI: 1.13–1.73, n=9 studies). In these 5 reports, mREs for duration, frequency, and cumulative night shift work exposure were inconsistent. Meta-analyses of cohort, Asian, and more fully-adjusted studies generally resulted in lower mREs than case-control, European, American, or minimally-adjusted studies. Most used random effects models due to statistically significant between-study heterogeneity. Publication bias was not evident in any of the 5 meta-analyses.

Conclusions Substantial heterogeneity is to be expected in epidemiological studies done in various settings, and among diverse populations. Future evaluations of shift work carcinogenic potential need to incorporate high quality meta-analyses that better assess and account for individual study quality.