

between each exposure method (individual, full JEM and asymptomatic JEM) and hand pain (Prevalence ratios with asymptomatic JEM=1.15–1.34; all $p < 0.05$).

Conclusions A JEM using responses only from asymptomatic workers created more homogenous exposure groups, but initial analyses showed no other significant evidence of biased exposure estimates due to symptoms. JEMs are a useful method of exposure assignment for some epidemiological studies of musculoskeletal disorders.

Oral Presentation

Intervention Studies

0166

MISMATCH BETWEEN SURVEILLANCE OF RISKS AND RECORDED INJURIES IN CONSTRUCTION: INTEGRATION OF ERGONOMICS INTO A COMPREHENSIVE SAFETY PROGRAM

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Background Musculoskeletal disorders (MSD) are the most common nonfatal injuries in construction, occurring more frequently in construction than in most other industries. Construction safety programs typically focus on traumatic injuries and rarely address ergonomic hazards. This project presents data from a gap analysis that is driving an ongoing intervention to incorporate MSD prevention into an existing safety program.

Methods Using data from three large construction projects, we examined differences in annual injury records for MSD compared to other common hazards (falls, struck by, electrocution), frequency of hazards noted on daily pre-task safety assessment forms (PTSA), and topics presented in weekly safety trainings.

Results 26% of recorded injuries were MSD, primarily from lifting, and similar to the proportions from falls (26%) and "struck bys" (32%). However, only 3 of 152 weekly safety trainings related to lifting. PTSA forms showed that workers commonly recognised and recorded potential hazards from falls (40%), struck bys (47%), and lifting (41%) but rarely recognised other MSD risks such as poor posture (9%). When recognised, adequate hazard controls were usually described for falls (96%) and struck bys (65%), but less often for lifting and other MSD risks (45%).

Conclusions Despite having many musculoskeletal injuries, the studied safety program paid little attention to ergonomic training, hazard recognition, and abatement compared to other types of hazards. Our ongoing intervention incorporates ergonomic surveillance, risk assessment, and consistent monitoring of controls into the overall safety management system. Initial results of worksite audits and delivery of the modified program will be presented.

Poster Presentation

Injuries

0167

ASSOCIATION BETWEEN AMBIENT TEMPERATURE AND OCCUPATIONAL INJURY

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Background Exposure to high temperature has been linked to adverse effects including cardiovascular and renal functions. It was also proposed to diminish human performance capacity and increase accident risk. However, the effects of high temperature on occupational injury have not been extensively studied.

Objective The aim of this study was to determine the association between ambient temperature and occupational injury (OI) occurrence.

Material and Methods OI information was extracted from the National Health Insurance Research Database (NHIRD). Daily ambient temperature and relative humidity (RH) were obtained from the Taiwan EPA air monitoring station. The day of first time OI outpatient/emergency visits during 2006–2011 was used as the event day. The same weekdays of the month were used as the referent day. Time-stratified case-crossover design and conditional logistic regression was used to investigate the relationship between ambient temperature and OI outpatient visits, adjusting for RH.

Results There were 18 951 first time OI outpatient/emergency visits during 2006–2011. The odds ratio (OR) of OI outpatient visits associated with per interquartile range (7.7 degree centigrade) increase in ambient temperature of the same day (lag 0 day) was 1.15 (95% confidence interval, CI: 1.08–1.22). The ORs associated with lag1 (the day before visit day) to lag3 day was 1.13 (95% CI: 1.06–1.19), 1.11 (95% CI: 1.04–1.17), and 1.11 (95% CI: 1.02–1.14), respectively.

Conclusion Exposure to higher ambient temperature was associated with increased risk of OI outpatient visits.

Poster Presentation

Exposure Assessment

0168

QUANTIFICATION OF VIABLE STAPHYLOCOCCUS AUREUS AND VIABLE BACTERIA IN WORKPLACES BY PROPIDIUM MONOAZIDE WITH QPCR

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Viable bacteria and *Staphylococcus aureus* in air have been linked to human diseases and considered as the threats in occupational health. Rapidly and accurately monitoring these bioaerosols by a reliable method is essential in characterising human exposure and health risk. This study first evaluated quantitative PCR (qPCR) with propidium monoazide (PMA) of 1.5–46 µg/mL to exclusively quantify viable *S. aureus* of 3–8 log CFU/mL. Results showed qPCR with 1.5 and 2.3 µg/mL PMA performed optimal with a great linearity over six orders of magnitude ($R^2 \geq 0.9$). Viable bacteria and *S. aureus* were further determined with PMA-qPCR for air samples collected from places including cafeteria, kitchen, food waste recycling site and public library. Viable bacteria averaged 1.9×10^4 cells/m³ ranging from 4.7×10^2 to 1.2×10^5 cells/m³. *S. aureus* were detected in 42.3% of samples for which cell levels varied between 4.2×10^1 and 2.8×10^4 cells/m³. Concentrations of *S. aureus* and viable bacteria were positively correlated ($r=0.61$, $p<0.005$) and the percentages of *S. aureus* among viable bacteria averaged 22.7% with 11.6%–43.6% in various locations. With the PMA-qPCR technique, this study demonstrates that the abundance of viable *S. aureus* and total viable bacterial aerosols in various types of occupational fields can be simultaneously quantified. This molecular assay should be taken into account as it will assist occupational hygienists and epidemiologists obtain reliable exposure data in assessing exposure and health risk, managing occupational health and protecting people from biohazards.

Poster Presentation

Injuries

0169

THE EFFECT OF PSYCHOLOGICAL SYMPTOM WITHIN 1 YEAR AFTER OCCUPATIONAL INJURY ON LONG-TERM SELF-PERCEIVED HEALTH STATUS

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Background Certain proportion of workers developed psychological symptoms within 1 year after occupational injury. Mental health is associated with overall health status. However, few studies examined the effect of psychological symptoms after occupational injury on long-term health status. This study aims to determine the impact of psychological symptoms within 1 year after occupational injury on health status six years later.

Method 2308 workers who sustained an occupational injury in 2009 and responded to a survey at 3 or 12 months after their injury were followed up in 2015. At 6 years after the injury, they were invited to participate in a questionnaire survey, which included return-to-work condition and self-rated health status. Population attributable risks (PARs) were

estimated to assess the effect of psychological symptom on self-rated poor health.

Results A total of 570 workers (33.5%) completed the questionnaire. Injured workers who had adverse life event within follow-up period, had family member requiring care, did not return-to-work within 1 year after the injury, had severe psychological symptom within 1 year after the injury, and whose physical appearance was severely affected had a higher risk of self-rated poor health. Adverse life event within follow-up period was most important factor, accounting for 34.3% of self-perceived poor health, followed by severe psychological symptom within 1 year after the injury (15.0%), and severely affected physical appearance (11.7%).

Conclusion Injury severity and severe psychological symptoms after occupational injury were risk factors for poor health status. Interventions addressing these factors are warranted to reduce psychological ailments after occupational injury.

Oral Presentation

Occupational Medicine (SCOM/Modernet)

0171

SEDENTARY WORK AND RISK OF VENOUS THROMBOEMBOLISM

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Objective Prolonged seated immobility during long-distance flights is related to an increased risk of venous thromboembolism (VTE) but little is known on the risk, if any, related to sedentary work. The objective of this paper was to examine the risk of VTE according to sitting posture at work.

Methods A total of 88 077 participants from the Copenhagen City Heart Study and the Copenhagen General Population Study were included in the study cohort, all without previous thromboembolic events and aged below 65 years. Activity level at work was obtained at baseline through self-administered questionnaires. VTEs were identified through national patient registries with complete coverage. Survival analyses were performed to determine the risk of VTE according to activity level at work with adjustment for a range of known determinants including lifestyle and coagulation factors.

Results During the follow-up period of 5 79 116 person years (mean follow-up, 7 years) 805 participants experienced their first venous thromboembolic event. 42% of the population categorised themselves as sedentary workers. Multivariable adjusted analyses showed no difference in risk of VTE between sedentary and walking work [hazard ratio (HR) 0.95 (95% confidence interval (CI), 0.80–1.14)]. Likewise, when considering activity level at work on a continuous scale, defined by Metabolic equivalents (METs), multivariable adjusted HR for 1 MET increase was 1.04 (95% CI 0.96–1.13).