This integrative project will gain insights in the exposure determinants that drive the physiopathological effects, thus allowing an efficient prevention strategy to be developed.

Poster Presentation

Exposure Assessment

0073 RESPIRABLE DUST AND CRYSTALLINE SILICA EXPOSURE AMONG CONCRETE FINISHING WORKERS IN CONSTRUCTION INDUSTRY

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Objectives The objective of this study was to evaluate the concentration and size-distribution of respirable crystalline silica among concrete finishers in the construction industry.

Methods Active-specific personal air sampling (n=129) were carried out in eight apartment complex construction sites by using PVC(poly vinyl chloride) filters with aluminium cyclones (flow rate at 2.5Lpm). Crystalline silica was analysed by FTIR (Fourier-transform infrared spectroscopy). The concentration of crystalline silica were showed by three different types of construction jobs(concrete chipping, grinding, plastering) and four different workplace(exterior wall, inside of apartment unit, staircase, underground parking lot).

Results The concentration of respirable crystalline silica was highest in concrete grinding(2.058 mg/m³) followed by concrete chipping(0.123 mg/m³), and plastering work(0.003 mg/m³). Concentration of crystalline silica was differ by the types of workplace in concrete grinding work, the concentration of respirable crystalline silica in staircase shows highest concentration(4.177 mg/m³) followed by inside of apartment unit (2.761 mg/m³), underground parking lot(1.302 mg/m³), and exterior wall(0.893 mg/m³). Considering the proportion of crystalline silica in the dust from job type, crystalline silica content was higher for concrete chipping work. The crystalline silica content was 6.921% in chipping work, 4.121% in grinding and 0.943 in plastering work. The correlation factors between respirable crystalline silica and respirable dust was 0.970 (p<0.01) in chipping work, 0.793 (p<0.01) in grinding and 0.100 (p=0.568) in plastering work.

Poster Presentation

Cancer

0074 LUNG CANCER RISK DUE TO EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA IN THE ABSENCE OF SILICOSIS

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Background Exposures to respirable crystalline silica (RCS) occur at a variety of workplaces, especially in mining and quarrying. The International Agency for Research on Cancer

(IARC) has classified RCS in the form of quartz or cristobalite dust as carcinogenic to humans (Group 1). But the role of silicosis for the development of lung cancer is still unclear: is silicosis a simple marker for a high cumulative exposure or is it an intermediate factor on the pathway to lung cancer?

Methods A review of published epidemiological studies in occupational settings with known exposure to RCS was performed.

Results The lung cancer risk among silicotics is in general higher than among subjects with unknown silicosis status. But epidemiological studies on non-silicotics, which can refer to data of silicosis registries, are scarce and often have only low statistical power. Therefore, even if the pooled lung cancer risk estimate for these studies is not significantly elevated, an independent contribution of RCS to lung cancer risk cannot be ruled out.

Conclusions The question remains whether RCS increase the lung cancer risk even in the absence of silicosis. Future studies on lung cancer mortality should include data from silicosis registries and/or information on contributing causes of death. The impact of competing occupational risk factors like radon or arsenic should also be taken into account.

Poster Presentation

Specific Occupations

0076 INVESTIGATION OF OCCUPATIONAL HEALTH HAZARDS AMONG GRASS TRIMMER OPERATORS

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Petrol-engine-driven grass (and brush) trimmers are widely used for cutting long grass in Taiwan, and the workers performing these tasks are generally contract workers with little or no awareness of the occupational hazards. In this study, the noise, vibration, and heat exposure of operators are measured in the field, and suggestions are proposed regarding potentially viable countermeasures to reduce hazards during operations.

More than half of all operators are exposed to time weighted average (TWA) sound levels greater than 85 dBA, meaning it is necessary to implement a hearing conservation program and wear hearing protectors during operations. The situation is aggravated when a number of machines are operated simultaneously, as it results in still higher levels of noise exposure, thus, operators should be separated by 15 m in order to avoid the combined level of noise exposure while working with these machines. Vibration measurements are conducted in accordance to ISO 5349 under realistic field conditions. The vibration acceleration value a_{xyz} of the studied trimmer lay between 2.41 m/s² and 5.74 m/s², and the equivalent value of 8 hours would be 2.08 m/s² ~4.97 m/s²; hence, typical use greater than 2.5 m/s² would require reasonably practicable exposure reduction measures to be taken. In this study, heat stress level is determined based on the Wet Bulb Globe Temperature (WBGT) Index, which found that level of heat stress, as defined by WBGT, exceeded 28°C and 28.5°C, as recommended by the ISO 7243 Standard and ACGIH Standard, respectively.

Poster Presentation

Other

0077 SHOULD OCCUPATIONAL HEALTH PATIENTS RECEIVE THE MEDICAL RECORDS CONCERNING THEIR MEDICAL VISIT?

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Objectives Our study examines the impact and importance of providing medical records at the end of the visit in occupational medicine clinics (OMC) on patients and occupational physicians.

Methods This study is a cross-sectional study. Data was collected from patients visiting four different OMC during 2015 for a fitness for work evaluation and includes 287 questionnaires. We also collected questionnaires from 62 occupational physicians (OPs). The satisfaction range in the questionnaires was between 1 (very slightly satisfied) and 5 (very satisfied).

Results When patients were provided with the medical information in writing and orally, they showed a higher level of understanding (4.3 and 4.4 compared to 3.8 respectively, $p<0.001$), higher level of confidence in their OP (4.4 and 4.3 compared to 3.7 and 4 respectively, $p<0.001$), higher level of satisfaction (4.3 and 4.4 compared to 3.8 respectively, $p<0.001$), and higher sense of control and ability to correct the record (1.8 compared to 1.4 respectively, $p<0.01$). Doctors responded that giving the results orally to patients (39/62, 63%) would lead to more appeals of decisions. However, they believed that giving oral information would better clarify the work restrictions (4.6 compared to 4.1 respectively, $p<0.05$) and cause patients to trust them more (4.6 compared to 4.1 respectively, $p<0.05$).

Conclusions We recommend sharing the medical records with patients and including an oral explanation, understanding that the advantages overcome the disadvantages of this approach.

Poster Presentation

Musculoskeletal

0078 THE RISK FOR LOW BACK PAIN CAUSED BY DRIVING PROFESSIONS IN A YOUNG ADULT POPULATION

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Background The aim of this study was to assess the relationship between the incidence and exacerbation of Low Back Pain (LBP) in young professional drivers

Methods In this controlled historical prospective study we included all male Israel Defense Forces (IDF) soldiers drafted between the years 1997–2006, followed them for 3 years and categorised them into three groups: administrative, light-duty

vehicle drivers and heavy vehicle drivers. The incidence and recrudescence of LBP was calculated for soldiers with or without a medical history of LBP in either professional group accordingly.

Results The incidence rates for LBP were 0.7%, 0.34% and 0.43% for the combined administrative and light vehicle driver groups, heavy vehicle driver and total driver groups, respectively (averagely 0.65%). The Relative Risk (RR) for severe LBP exacerbation for soldiers with a history of LBP without clinical findings was 1.4 ($p<0.001$) and for soldiers with a history of LBP with mild clinical/radiographic findings was 3.8 ($p<0.01$). Examination of RR exacerbation rates within different severity tiers yielded a similar trend amongst all professions.

Conclusions The crude incidence rate for LBP was found to be 0.65% - lower than literature reported rates, possibly attributable to our more stringent variable definition of severe LBP. The most prominent risk factors identified in our study include: a history of LBP and multiple complaints of LBP at recruitment. Driving profession in young age is not a risk for LBP.

Poster Presentation

Exposure Assessment

0079 CHARACTERISTICS OF PARTICLE SIZE DISTRIBUTION IN CONCRETE FINISHING WORK

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It is known that workers at construction sites are exposed to the risk of dust containing crystalline silica while crushing concrete, grinding concrete surfaces, cutting bricks, cutting rocks, and ballasting structures. This study was conducted to identify size-distribution of crystalline silica among concrete finishers in the construction industry to establish systemized management for the construction sites.

In order to measure the size of dust, a Personal Cascade Impactor (Model 298, Anderson Sampler Inc., USA) composed of an 8-stage impact board was used. Dust was weighed three times using an electronic balance with 10–7 g readability (XP2U, Mettler toledo, Switzerland) to acquire the mean value. Crystalline silica was analysed using Fourier-transform infrared spectroscopy (FT-IR) in accordance with the NIOSH Manual of Analytical Methods of NIOSH #7602. To calculate the mass fraction of dust for each size of dust particle, ACGIH's Particle size-Selective Sampling Criteria for Airborne Particulate Matter was used.

The results of weighing dust collected from each stage and a cumulative graph was illustrated from the stage with the smallest particle size (stage, 0.52 μm or smaller) to draw the trend line and find the median diameter of mass using the effective diameter limit corresponding to 50% cumulative probability. Then, it was 10.958 μm –12.206 μm for concrete chipping and 10.462 μm –11.476 μm for concrete grinding. Considering the proportion of crystalline silica in the dust from each stage, crystalline silica content was higher for smaller particle sizes. The content was particularly high in stage 6 (1.55–3.5 μm) and stage 8 (0.52–0.93 μm).