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.