Poster Presentation

Musculoskeletal

0069 KNEE DISORDERS, WORK LIMITATIONS AND WORK STATUS. FIRST RESULTS FROM THE CONSTANCES COHORT

¹Alexis Descatha*, ²Paul Kuijer, ³Ann-Marie Dale, ⁴Audrey Petit, ²Monique Frings-Dresen, ³Bradley A Evanoff, ¹Annette Lederer, ⁴Yves Roquelaure. ¹Inserm UVSQ AP-HP, Villejuif, France; ²Academic Medical Centre, Coronal Institute of Occupational Health, Amsterdam, The Netherlands; ³Washington University in St Louis, St-Louis, MO, USA; ⁴CHU Angers Inserm, Angers, France

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Objective Knee disorders, including osteoarthritis and knee replacement, are a growing problem for more and more workers due to increasing retirement ages. Aim is to describe work-related outcomes of possible knee replacement, meniscal surgery and other knee pain in a new large population cohort at its inception.

Methods The CONSTANCES cohort is a randomly selected representative sample of French adults aged 18–69 years at recruitment. Participants completed symptom questionnaires, and surgery in the last 4 years period was collected from a national health claims database. Knee disorders were defined as severe or daily knee pain, or history of surgery for meniscal tear or knee replacement. We considered several outcomes, including self-reported functional limitations (climbing stairs, walk 1 km, carrying 5 kg), task modifications and current work status. Multinomial logistic models were built separately for men and women; only variables with an Odds Ratio >2 (or <0.5) at $p < 0.001$ were considered significant after adjustment for other relevant variables.

Results Of 85,826 participants, of whom 38,571 (44.9%) reported knee pain. 10,683 (12.4%) reported severe knee pain, 1305 (1.5%) with meniscal tear surgery, and 403 (0.5%) with knee replacement. All limitations considered were significantly associated with severe knee pain, meniscus surgery and knee replacements among men and women, such as task modification for knee disorders. Loss of activity was only significantly associated with knee replacement among men.

Conclusions Based on a cross-sectional design at this time, these first analyses reported a poor outcomes of knee disorders for work-related activities.

Oral Presentation

Dusts and Fibres

0071 VALIDATION OF ACM CHECK: A MOBILE APPLICATION TO SCREEN FOR ASBESTOS IN RESIDENTIAL SETTINGS

Matthew Govorko. Curtin University, Perth, Western Australia, Australia

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Background/Aim A large reservoir of *in situ* asbestos-containing materials (ACM) remain in residential settings throughout Australia. Tradesmen and householders are at risk of exposure if they work on or near these materials, without knowing they contain asbestos. The aim of this study was to validate ACM Check, a

screening tool to identify and assess the condition of potential ACMs located in and around Western Australian homes.

Methods A two stage cross-sectional study was undertaken: 1) completion of ACM Check by 40 Western Australian householders, and 2) an on-site asbestos inspection by an experienced Environmental Consultant, which included collecting samples of suspect ACM to be tested in a laboratory. Cohen's kappa coefficient compared the results obtained from ACM Check with those of the Environmental Consultant.

Results 40 houses ranging in date of construction from 1898 through to 1988 with a median year of 1966, were sampled. 38 of the 40 houses (95%) were identified as having one or more 'possible' or 'likely' asbestos-containing materials present on the property. Overall, there was perfect agreement between ACM Check and the Environmental Consultant's assessment for any (1 or more) ACM present, $K=1.00$, $p < .005$, perfect agreement for any ACM located outside the house, $K=1.00$, $p < .005$, and moderate agreement for any ACM located inside the house, $K=0.593$, $p < .005$.

Conclusions ACM Check is a reliable screening tool to identify *in situ* ACMs in Western Australian residential settings. Its method can potentially be modified for implementation in other countries

Poster Presentation

Chemicals

0072 OIL MIST, FROM EXPOSURE DETERMINANTS TO EARLY EFFECT MARKERS: AN INTEGRATIVE STUDY DESIGN

³Sébastien Hulo, ¹Eve Bourgard, ²Jean-Jacques Sauvain, ¹Valérie Demange, ²Nancy Hopf, ¹Yves Guichard, ¹Fanny Jeandel, ³Jean-Louis Edmée, ³Nathalie Chérot, ^{1,2}Pascal Wild*. ¹INRS, Vandoeuvre, France; ²IST, Lausanne, Switzerland; ³CHU Lille, EA 4483 – IMPECS – IMPact de l'Environnement Chimique sur la Santé humaine, Lille, France

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The present project focuses on the effects of occupational exposure to oil mists on a panel of exposure and effect biomarkers in an epidemiological study. The assumption is that different health outcomes are caused by reactive particles causing oxidative stress leading to lung inflammation and ultimately cancer or asthma.

Ninety workers from France and Switzerland (30 controls, 30 exposed to straight cutting oil and 30 to soluble cutting oil) will be followed over two days after a non-exposed period of at least two days.

The exposure assessment is based on measurements of particles, metals, aldehydes, amines, the intrinsic oxidative potential of aerosols and the cutting oil. Furthermore, exposure biomarkers are measured in exhaled breath condensate (EBC)-metals, ions (nitrite, nitrate...) and urine –metals, metabolites of PAHs-. Finally, exposure determinants will be collected to guide future efforts in exposure prevention.

Effect biomarkers of oxidative stress (malondialdehyde, 8-isoprostane, 8-hydroxy-2'-deoxyguanosine) in EBC and urine will be repeatedly measured as well as exhaled nitric oxide (FeNO), an inflammation marker.

Genotoxic effects will be assessed using the buccal micronucleus cytome assay. Finally, the possible chronic effects of oil mist exposure on respiratory health will be explored by standard questionnaires.

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

Hyunhee Park, Ensong Hwang*. *Korea Occupational Safety and Health Agency, Ulsan, Republic of Korea*

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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

Matthias Möhner. *Federal Institute for Occupational Safety and Health, Berlin, Germany*

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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

¹Shih-Yi Lu*, ¹Yen-Hui Lin, ²Kuei-Yi Lin. ¹*Chung Shan Medical University, Taichung City, Taiwan*; ²*Institute of Labour, Occupational Safety and Health, New Taipei City, Taiwan*

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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.