Poster Presentation

Exposure assessment

0211 OCCUPATIONAL HEAT STRESS AND HEAT STRAIN ASSESSMENT USING CLIMATE SERVICE INFORMATION

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Global warming will unquestionably increase the impact of heat on individuals. The increasing prevalence of this environmental health risk requires the improvement of exposure assessment linked to meteorological data. Reliable assessments of heat stress and heat strain will help to reveal the size of the problem and design appropriate interventions at individual, workplace and societal level. However, it is common that air temperature is widely used as a single parameter in epidemiological studies on the effect of health. The evaluation of occupational heat stress requires measurement of four thermal climate factors (air temperature, humidity, air velocity and heat radiation); available weather station data may serve this purpose. However, the use of meteorological data for such assessment is limited because weather stations do not traditionally and directly measure some important climate factors, e.g. solar radiation. In addition, local workplace environmental conditions such as local heat sources, physical workload related metabolic heat production within the human body, and clothing properties, all affect the exchange of heat between the body and the environment. A robust occupational heat stress and heat strain index should properly address all these factors. This article reviews and highlights a number of selected indices, indicating their strengths and weaknesses in relation to meteorological data, local workplace environments, body heat production and the use of protective clothing. These heat stress and heat strain indices include Wet Bulb Globe Temperature, Discomfort Index, Predicted Heat Strain index, and Universal Thermal Climate Index. Relevant preventive strategies for alleviating heat strain are proposed.

Oral Presentation

Exposure assessment

0289 'DAVID'S CHEESE BREAD' METHOD: WORKLOAD QUANTITATIVEEXPOSURETHRESHOLDS DETECTION USING ADJUSTED HAZARDMULTIVARIATE PARAMETRIC MODELLING, USEFUL INCUMULATIVE-TRAUMA DISORDERS PREVENTION AND WITHIN THEIR CAUSAL ASSESSMENT

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Background Qualitative methods are frequently used for workload assessment due to their relative low-cost but their evidence lack, high subjectivity and inaccurate conclusions lead to develop quantitative evidence-based methods for Cumulative Trauma Disorders evaluation. This research aims to generate robust and reliable evidence useful in prevention systems and within workers' compensation processes (causal assessment) by measuring cumulative effective working time to define suitable exposure thresholds.

Methods A retrospective cohort study was assembled with workers from different positions. Inclusion/exclusion criteria were rigorously applied to finally accept 328 workers (656 shoulders). Entire clinic history was analyzed towards obtaining important clinical variables. Each shoulder workload was assessed independently getting cumulative exposure time to movement angles, repetitive motions, load lifting, exertion and vibration, adjusting by rest/break periods and other important covariates, controlling confusing effects. The exposure thresholds were obtained using an adjusted multivariate Weibull regression modeling. Huber's M-estimator was used warranting robustestimators to correct both shoulders non-completely independent measures. Final model was built according with Hosmer-Lemeshow-May's covariates purposeful selection principles.

Findings/conclusions Within the adjusted multivariate final model, we could set hazard rate ratio (HRR) into five different clusters across cohort exposure time-line: 'D' or baseline hazard zone; 'a' zone (HRR≈1; p-value≥0.05); 'v' or risk zone (HRR>1; p-value<0.05); 'i' or survivors zone (HRR≈1; p-value≥0.05); and 'd' or super-survivors zone (HRR<1; p-value<0.05). Shortest cumulative times within 'v' zone were selected as exposure thresholds. For workload factors, we were able to clearly define zones and thresholds. We've also named 'v' cluster as 'cheese' zone and others as 'no-cheese' areas.

Oral Presentation

Respiratory

0413 SHORT-TERM AND SUB-CHRONIC EFFECTS OF TRAFFIC-RELATED BLACK CARBON ON SMALL AIRWAY OBSTRUCTION IN METRO MANILA TRAFFIC ENFORCERS

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Introduction Exposure to traffic-related black carbon (BC) has been linked to decreased forced expiratory flow (FEF25–75%) and Tiffeneau-Pinelli Index (FEV1/FVC), markers of airway obstruction, in several epidemiological studies. We evaluated whether short-term and sub-chronic exposures to BC on the road is linked with markers of airway obstruction in a cohort of traffic enforcers.

Methods We studied repeated measurements of FEF25–75% and FEV1/FVC on 158 traffic enforcers from the Metropolitan Manila Development Authority (MMDA) Health Study using mixed-effects models with random intercepts. We fitted a quadratic