Poster Presentation

Chemicals

0226 AFFECTION IN THE AUDITORY BRAINSTEM PATHWAY ASSOCIATED WITH OCCUPATIONAL, LOW-LEVEL EXPOSURE TO ETHYLBENZENE

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10.1136/oemed-2017-104636.180

Introduction Hearing loss in occupational exposure to a solvent mixture has been already reported; however, mixture in those reports did not contain ethylbenzene, a compound showing peripheral ototoxicity in animals exposed to high levels. In this work, we evaluated the auditory brainstem pathway in two samples of workers exposed to different levels of a solvent mixture where ethylbenzene was present, compared to a reference group.

Material and methods Individual exposure levels for up to seven compounds were obtained in two groups: Exposed (n=21 gas station attendants, GS, and leather shoe factory workers, LS) and Non-exposed (n=21, administrative workers) all of them from the city of León Guanajuato, México. The click-evoked auditory brainstem response test was performed in both groups.

Results Toluene, n-hexane, acetone, ethylbenzene, xylene and methyl ethyl ketone exposure levels were higher in LS ($p<0.001$). Only n-hexane exposure levels were above the permissible levels, while mean ethylbenzene exposure levels ranged 0.4–14.58 mg/m3. Wave V latency at four different points of stimulation for both ears was delayed in the exposed group, as well as the I-V and I-III interwave latencies at 70 dB ($p<0.05$). LS workers showed a delayed I-III interpeak interval compared to non-exposed group. Also in LS, ethylbenzene exposure levels showed a significant correlation with wave V latency at 40 dB ($r=0.8$, $p=0.008$).

Conclusion Our results point out to a central affection in the auditory system caused by ethylbenzene in a dose response manner. Workers exposed to ethylbenzene levels far below the permissible exposure limit should be closely monitored for early ototoxicity effects.

Oral Presentation

Working Conditions

0227 RISK OF HEAT RELATED ILLNESS: DIFFERENCES BETWEEN MALE AND FEMALE FARMWORKERS WITH RESPECT TO HYDRATION PRACTICES

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10.1136/oemed-2017-104636.181

Introduction Dehydration is a major risk factor for Heat Related Illness (HRI) in farmworkers.

Methods 587 acclimatised Latina/o farmworkers were monitored once each, in the hot, dry, California Central Valley over the summers of 2014–2015. Weight was recorded before and after the shift in a minimum level of clothing to assess change in hydration. To assess activity, accelerometers were worn, and questionnaires were administered in Spanish to collect occupational characteristics.

Results 66.2% of the participants were male; both sexes had a mean age 38.7 years. Men drank more, either total or just water (adjusted for height) than women (mean volumes 112 v 77oz, or 97 v 67 oz, *PVal* <0.001 for both). However men were more likely to lose ≥1.5% of their body weight: 64 (16.5%) v 6 (3.0%) women *PVal* <0.0001. Shift lengths were similar, but both total and mean activity levels were higher in males 2 02 000 v 1 33 000 and 391 v 255 counts per minute, respectively *PVal* <0.0001 for both.

Being male, working any type of piece rate and higher mean activity were all independently associated with weight loss over the shift in a multivariable linear regression model. Parameter and (95% CI) respectively: - 0.31 (- 0.43 to - 0.19), 0.18 (0.05–0.309), and mean cpm/100 0.022 (0.001–0.045).

Conclusion Male Latino farmworkers are more at risk of dehydration especially those who work high activity tasks or any form of piece rate. Employers should focus special attention on the safety of these workers.

Poster Presentation

Risk Assessment

0229 RISK OF HEAT RELATED ILLNESS IN LATINO AGRICULTURAL WORKERS: CORE BODY TEMPERATURE AND WORK TASK

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10.1136/oemed-2017-104636.182

Introduction Environmental heat and work-rate are risk factors for Heat Related Illness (HRI). Work-rate by task and core temperature have not been quantified in California farmworkers.

Methods Farmworkers were monitored for one work-shift each in the summers of 2014–2015. Individuals' core temperature was assessed throughout the shift using an ingestible sensor, a 3 min moving average computed and maximum temperature identified. Accelerometers were worn, and NHANES criteria used to classify counts per minute (cpm) into sedentary, low, moderate and vigorous activity. Daily work-rate was categorised by the number of minutes spent in moderate and/or vigorous activity (<30, 30 to 90,>90). Questionnaires administered in Spanish collected occupational tasks conducted and self-rated environmental heat exposure.

Results 499 Latina/o farmworkers performed only one task on their shift. The mean activity in cpm was highest for tree/vine harvesters 445 (SD 225) and lowest for produce sorters 193 (SD 167). 22 workers recorded a maximal core temperature >38.5°C, a criteria for heat stress in acclimatised workers. In a multivariable logistic regression high body temperature was associated with both the number of minutes

working at a moderate/vigorous rate and self-rated environmental heat; OR and (95% CI) for ≥90 v<90 min high activity 3.6 (1.5–8.5). Irrigators were the only classification with statistically significant association with elevated core temperature; OR and (95% CI) 3.7 (1.4–9.6).
Conclusion Farmworkers, who exceed 90 min a day in moderate/vigorous activity and/or irrigators, are at higher risk of HRI. These workers may need closer monitoring for their safety.

Poster Presentation
Shift Work

0230 THE RELATIONSHIP BETWEEN SHIFT WORK AND METABOLIC SYNDROME AMONG ELECTRONICS INDUSTRY WORKERS

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10.1136/oemed-2017-104636.183

Objective This study aimed to determine an association between shift work and the metabolic syndrome (MetS) in the electronics industry.
Methods In total, 12 583 employees who participated in health examination and questionnaire were evaluated. MetS was measured by the National Education Program Adult Treatment Panel III (NCEP) criteria using examination results. We performed multiple logistic regression analyses to test the relationship between shift work and MetS.
Results The prevalence rate of MetS among total group was 8.8%. After controlling for the potential confounders, MetS of male daytime workers was more prevalent compared to shift workers. However, prevalence of the MetS showed significant increasing risk according to the number of years of shift work (a period of 5~9 years : OR 3.48, 95% CI 1.20–10.08; 10~14 years : OR 4.14, 95% CI 1.34–12.74; 15 years : OR 5.72, 95% CI 1.83–17.83 vs. 1~4 years). Although no significant differences in prevalence of the MetS between daytime and shift work were observed, the risk for the development of MetS increased with accumulated years of shift work among women (a period of 5~9 years : OR 3.12, 95% CI 1.72–5.67; 10~14 years : OR 5.57, 95% CI 2.91–10.66; 15 years : OR 5.17, 95% CI 2.48–10.81 vs. 1~4 years).
Conclusion This study suggests that the duration of shift work increases the risk for developing the MetS.

Poster Presentation
Respiratory

0231 OCCUPATIONAL RESPIRABLE CYSTALLINE SILICA EXPOSURE RELATED TO FEV$_1$ DECLINE AMONG NORMAL OR EARLY ABNORMAL ILO CHEST-RADIOGRAPHS OF SANDSTONE-WORKERS; A SIX MONTH FOLLOW UP

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10.1136/oemed-2017-104636.184

Background Respirable crystalline silica (RCS) exposure among cottage industrial results in rising silicosis case. Therefore medical surveillance remains crucial. Recently FEV1 decline has been established as a surveillance tool.
Objective To explore the relationship between occupational RCS exposure and FEV1 decline among sand-stone workers who had ILO chest radiographs profusion CAG ≤1/1.
Material and method This study was designed as a descriptive study. The participants were sand-stone workers and non-occupational RCS exposure (n=139) who had an ILO chest radiographs profusion CAG ≤1/1. FEV1 was measured using follow-up FVC manoeuvre spirometry testing. History of work, duration of exposure and other related issues were obtained through questionnaire interviews.
Result The majority of participants were female, non smokers and no previous respiratory diseases. Mean of FEV1 decline was found higher in the high RCS exposure group (118.6 ±137.7 ml) as compared to non-occupational RCS exposure group (median 45 ml, IQR 100 ml). When subgroup of non smokers considered, being classified into high exposure was found to have the highest FEV1 decline (99.3 ml ±129.9 ml.). In addition, the highest proportion of participants who had FEV1 decline >100 ml revealed in the high RCS exposure group (65.5%) followed by medium (43.8%) and low exposure group (19.6%) respectively .
Conclusion Intensity of RCS exposure strongly related to FEV1 decline. FEV1 decline more than 100 ml per year is appropriate to be used as a medical screening for RCS exposure and the effect could be found as early as six month exposure.

Poster Presentation
Specific Occupations

0233 PHYSICAL AND MENTAL HEALTH OF NON-PROFESSIONAL EMERGENCY RESPONDER IN A HEALTHCARE INSTITUTION

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10.1136/oemed-2017-104636.185