

Oral Presentation

Injuries

0115 GENDER AND PROPORTIONATE MORTALITY BY ACUTE OCCUPATIONAL PESTICIDES POISONING AMONG AGRICULTURAL WORKERS IN BRAZIL

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10.1136/oemed-2017-104636.89

To identify gender-related differences in proportionate mortality estimates of acute occupational pesticides poisoning among farmer workers in Brazil. This is a proportionate mortality study, carried out with work-related injuries deaths, which occurred with farmer workers from 16 to 70 years of age, focusing acute occupational pesticide poisoning. Data were from the Brazilian Mortality Information System (SIM) from 2000 to 2013. Potential associated factors were age group, skin colour, marital status, education and country region. Estimates of proportionate mortality odds ratio of work-related acute pesticide poisoning was association the measure.

There were 6754 work-related injuries deaths among agricultural workers, 643 caused by occupational acute pesticide poisoning, a proportionate mortality of 9.5%, higher among women (n=65; 24.9%) compared with men (n=578; 8.9%) in general, and for all categories of potential associated factors. The contribution of work-related fatal pesticide poisoning relative to all occupational injuries among farmer women was higher when they were under 30 years of age, had brown or black skin colour, lived in the poorest regions of the country and the injury occurred during summer. Distinctively, males had relative excess of cases when were older, white, single or married, better education and the death occurred in all seasons but winter. Work-related deaths caused by pesticide poisoning are preventable and should not occur or be a very rare event as described in developing countries. The widespread use of pesticides in agriculture in Brazil warns to implement safer practices for all, targeting the growing number of women labour force, and young workers expressive in rural areas.

Oral Presentation

Cancer

0116 EVIDENCE OF DOSE-RESPONSE IN THE CAUSATION OF MESOTHELIOMA FROM ENVIRONMENTAL EXPOSURE

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10.1136/oemed-2017-104636.90

We investigated the relation between cumulative asbestos exposure and pleural malignant mesothelioma (PMM) in areas with environmental asbestos exposure from human activities and

asbestos material in place, using our studies and a literature review.

Casale Monferrato (NW Italy) presents high PMM incidence caused by asbestos contamination at work and in the general environment from the asbestos cement Eternit plant that operated until 1986. A population-based case-control study including PMM diagnosed between January 2001 and June 2006 (200 PMM and 348 controls) observed among subjects never occupationally exposed a dose response relationship consistent with that caused by occupational exposures, based on individual assessment of environmental and domestic exposures. ORs were 3.8 (CI 95% 1.3 to 11.1) for cumulative exposure from ≥ 0.1 to < 1 f/ml-year, 14.8 (5.7 to 38.6) for ≥ 1 – < 10 f/ml-y and 23.3 (CI 95% 2.9 to 186.9) for > 10 f/ml-y (reference: background level of asbestos exposure). ORs of about 2, statistically significant, were observed for domestic exposure and for living in houses near buildings with large asbestos cement parts.

Similar trends were observed in other studies that explored the dose response relationship in the low dose range (Iwatsubo et al 1998, Rodelsperger et al 2001, Lacourt et al 2014).

PMM risk increased with cumulative asbestos exposure in analyses limited to subjects non-occupationally exposed and in the environmental exposure range. These results provide indication of risk associated with common sources of environmental exposure and are highly relevant for the evaluation of residual risk after the cessation of asbestos industrial use.

Poster Presentation

Respiratory

0117 PERFORMANCE EVALUATION OF N95 RESPIRATOR AFFECTING FACTORS

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10.1136/oemed-2017-104636.91

This study was to test the filtration efficiency and breathing resistance of N95 respirators of different storage periods using the most penetrating particle size aerosol by automated filter tester (TSI, model 8130). quality factor (q_f) was calculated to access possible effects of storage conditions and disinfection methods such as autoclaving and Gamma irradiation on the electric quality of fibres of the respirators.

The analysis of N95 respirators with different storage conditions revealed that: A statistical difference ($p=0.0453$) was noted in aerosol filtration among N95 respirators of various storage periods, and the penetration was lower in respirators within the valid date compared with those expired respirators. There was also a statistical significance ($p=0.0082$) in breathing resistance among various storage periods. Autoclaving method of disinfection increased penetration, but decreased q_f in respirators within valid dates when compared with those without disinfection. The dosage of 10 kGY, 25 kGY or 30 kGY Gamma irradiation also increased penetration, resistance and decreased q_f . There was no significant difference on penetration, resistance and q_f between respirators within or outside the valid dates when they were treated with the same

disinfection methods except that after autoclave, respirators within valid date have significant lower breathing resistance compared with the expired respirators ($p=0.0282$).

Although the various storage periods of N95 respirators reveal statistical significance, however, this is not the major affecting factor of filters fibre charge and filter quality. The method of Gamma irradiation appears stronger than storage period and autoclave method in affecting filters fibre charge and qf.

Poster Presentation

Occupational Medicine (SCOM/Modernet)

0118 SAMPLING EVALUATION OF BIOAEROSOL AND ANTIBIOTIC-RESISTANT CHARACTERISTICS IN INTENSIVE CARE UNIT

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10.1136/oemed-2017-104636.92

Our research was based in a medical centre's Internal Medicine Intensive Care Unit (MICU) and Surgery Intensive Care Unit (SICU) located in central Taiwan. Three bioaerosol samplers were utilised (Anderson six-stage, AGI-30, and BioSampler) for sampling. Upon acquisition of samples, they were inoculated and cultured on BBL Trypticase Soy Agar (with 5% Sheep Blood) medium for growth. The bacterial colonies were later identified and analysed for antibiotic-resistant characteristics via BD Phoenix automated microbial identification and susceptibility test analyzer.

Research results have showed from the bioaerosol samples acquired within the MICU that bacteria and fungi below cut off size of 4.7 μm were primarily due to high possibility to enter human lung's alveolar regions of the body, thereby causing opportunistic infections. In terms of bacterial strain identification, Gram-positive bacteria were mainly isolated with biosafety level of II. As for antibiotic-resistant bacteria analysis of MICU, strains were identified 63.5% that were resistant to National Health Insurance Administration (NHIA) designated first (17 types) and second (18 types) line antibiotics. This phenomenon could very likely affect the medical staffs working within the hospital environment. As a result, recommendations for MICU ventilation designs should be carefully evaluated for the effectiveness of controlling nosocomial infections as well as proper implementation of personal protective equipment in order to reduce bioaerosol opportunistic infections and harmful exposure effects.

Oral Presentation

Pesticides

0119 DNA VARIANTS AND ORGANOPHOSPHATE NEUROTOXICITY AMONG EMERGING FARMERS IN THE WESTERN CAPE OF SOUTH AFRICA

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10.1136/oemed-2017-104636.93

Background Modulation of organophosphate (OP) neurotoxicity by genetic polymorphisms of xenobiotic metabolising enzymes (XMEs) has not previously been investigated

Objectives To investigate whether XMEs polymorphisms modify OP neurotoxicity among emerging farmers.

Methods A cross-sectional study of 301 emerging farmers was conducted. Neurotoxicity testing included forward and backward recall digit span and vibration sensitivity testing. Questionnaire data included demography, potential confounders and work history of pesticide exposures. Genomic DNA was analysed from study participants for DNA variants of two glutathione S-transferases (GST), N-acetyltransferase 2 (NAT2) and Paraoxonase 1 (PON1).

Results The median age of workers was 39 years (range: 30–48 years) of whom 54% were OP pesticide applicators. There was a low prevalence of the null genotype for GSTT1 (1%) and for GSTM1 (16%), while the genotypic frequency for the GA and AA grouping of rs1799931 (NAT2) was 10%. There was evidence of OP pesticide neurotoxicity modification by rs1799931 (NAT2), rs662 (PON1) and the null allele of GSTM1 in multivariate analysis. The strongest evidence of modification was observed for rs1799931 (NAT2) on the relationship between pesticide poisoning and impaired vibration sense. The increased prevalence of impaired vibration sense in OP poisoned compared to non-poisoned workers (Odds ratio=5.7, 95% confidence interval (CI): 1.4–22.7) was higher among those with the GG genotype than those with the GA and AA genotypes (Odds ratio=1.5, CI: 0.1–43.2).

Conclusion DNA variants of NAT2, PON1 and GSTM1 may modify OP neurotoxicity and this requires further exploration

Poster Presentation

Other

0120 PREDICTING LONG-TERM SICKNESS ABSENCE AND SUPPORTING RETURN-TO WORK PROCESSES, A QUANTITATIVE RESEARCH

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10.1136/oemed-2017-104636.94