

Results: After 50,899 person-years of follow-up, 111 individuals had developed HCC. The highest risk for HCC, compared with seronegative individuals without diabetes, was in anti-HCV(+) individuals with diabetes [incidence rate ratio (IRR), 76.0], then co-infected (IRR, 46.0), anti-HCV(+) without diabetes (IRR, 26.1), HBsAg(+) with diabetes (IRR, 21.4), and seronegative with diabetes (IRR, 7.2) ($P < 0.001$). Anti-HCV(+) ($n = 132$) and seronegative individuals ($n = 352$) with diabetes had a higher cumulative incidence rate of HCC than those without diabetes (log-rank test, $P < 0.001$). Multivariate Cox proportional hazards analysis showed that gender, age, BMI ≥ 30 , HBsAg(+) [hazards ratio (HR), 12.6], anti-HCV(+) (HR, 18.8), co-infection (HR, 25.9), and diabetes [HR, 2.7; 95% confidence interval (CI), 1.7-4.3] were independent predictors of HCC ($P < 0.05$). After stratifying hepatitis status in multivariate Cox analysis, diabetes was significant for seronegative [HR, 5.4; 95% CI, 1.7-17.1] and anti-HCV(+) individuals [HR, 3.1; 95% CI, 1.7-5.4]. BMI ≥ 30 was significant for HBsAg(+) individuals [HR = 3.3, 95% CI, 1.3-8.1]. Conclusion: Type 2 diabetes is a strong independent predictor of HCC in anti-HCV(+) and seronegative individuals but not in HBsAg(+) individuals.

Oral Track 23- Occupational & Environmental Health

OT23-1

Oxidative Stress Study on Nickel-Exposure Workers *Jiin-Chyuan J Luo*

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Nickel chloride, nickel subsulfide, and other nickel compounds are carcinogenic in laboratory animals. Epidemiologic studies have shown an increased incidence of cancers among nickel refinery workers. Poly circuit board (PCB) production is a big industry in Taiwan. Nickel electroplating is a required process during the PCB production. During the above operation workers have been exposed to nickel solution or aerosol via skin or respiratory tract. We performed oxidative stress biomarkers assay on 227 nickel-exposed workers from electroplating shops in a PCB plant to study nickel-induced pathogenesis. The 98 high nickel-exposed (urine nickel $> 6 \mu\text{g/g Cr}$) workers had significantly ($p=0.02$) higher MDA level than 57 low nickel-exposed (urine nickel $< 3 \mu\text{g/g Cr}$) workers after controlling for other factors. The high nickel-exposed workers had significantly ($p < 0.0001$) lower GSH level, and 72 mid-exposed (urine nickel $\geq 3, \leq 6 \mu\text{g/g Cr}$) workers had significantly ($p=0.02$) lower GSH level than low nickel-exposed worker after controlling for others. The high nickel-exposed workers had significantly ($p=0.001$) lower SOD level, and mid-exposed workers had significantly ($p=0.028$) lower SOD level than low nickel-exposed worker after controlling for others. The high nickel-exposed workers had significantly ($p=0.089$)

higher 8-OH-dG level than low nickel-exposed worker after controlling for others. The above result indicates that nickel exposure can induce oxidative stress as lipid peroxidation (MDA) and reduce anti-oxidative enzymes as GSH, SOD, and induce oxidative DNA damage as 8-OH-dG and confirms that oxidative stress plays an important in nickel-induced pathogenesis.

OT23-2

Increased Mortality Risk of Occupational Respiratory Diseases and Lung Cancer in Mongolia: A Follow-Up Study for 20 Years

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Objective: To analyze the standardized mortality ratios (SMR) for major occupational diseases in Mongolia based on the registered data of the National Center of Occupational Diseases in Mongolia.

Method: We established the life tables for the registered cohort of occupational diseases and the general population of Mongolia by linking with all registered death certificates during 1986-2006 obtained from the State Centre for Civil Registration. We estimated age-, gender-, and cause-specific mortality rate and SMR. The computation is performed on the LTAS.Net program.

Results: A total of 4598 cases certified as occupational diseases were included with 98751.9 person-years at risk accrued, in which 9% were deceased during the observation period. The overall SMR was 0.34, indicating a healthy worker effect. But there were increased SMR's for lung cancer (4.8, 95% CI 2.6, 8.1) and respiratory diseases (ORD) (4.8, 95% CI 4.0, 5.6). About 2/3 of deceased cases of lung cancer once worked in mining, 22.1% in construction and 10.3% in power plants. One-third of the deceased cases with lung cancer were attributable to silicosis/anthraco-silicosis, 32.4% to asbestoses. Another major source of increased SMR can be attributable to pneumoconiosis, of which there were 132 deceased workers and no such case in the general population without exposure.

Conclusion: Quick industrialization accompanies with an increasing trend of mortality risk of ORD, lung cancer in Mongolia. Proactive prevention and the enforcement of all regulations related to OSH are urgently needed.

OT23-3

Diarrhea and Sanitation in Developing Country Indonesian

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Diarrhea disease is a common cause of death in developing countries and the second most common cause of infant deaths worldwide. According to WHO (2003) there were 4 millions cases occurred in the world at the

year of 2000 with 2,2 millions death, mostly were children below five (5) years old. Diarrhea disease is a disease based on environmental condition which still major issues for health problem in Indonesia with mostly victims below five years old babies. It shows that the infants death cause of diarrhea tend to death results, as an extra ordinary accident. As a developing country, Indonesia death infants almost 162 thousands of infants below five years old or around 460 babies die every days. The Survey of SKRT (Survey Kesehatan Rumah Tangga) or healthy of the residence in Indonesia indicate that diarrhea disease become the second dead causes for babies below five and number three for babies and number five for all of ges. Each Indonesian kids has diarrhea episode of 1.6 – 2 times per year. Some of 41 municipalities district at 16 provinces reported KLB (extra ordinary accident) in their area. The amount of diarrhea cases reported 10..980 and 277 of them were dead. The awareness of clean water is too low, bad sanitations, minimum availability and sosial misbehave / unhealthy. NTT (Nusa Tenggara Timur) has the highest record of 2194 people, meanwhile east java, central java and west java around 196 thousands people. Any research with Chi-Square shows there are any relation between basic home sanitation equipments to diarrhe disease of infants below five years old with $p < \alpha$.

OT23-4

Incidence and Predictors of Onboard Injuries among Sri Lankan Flight Attendants

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Background: The purpose of this study was to estimate the incidence of onboard injury among Sri Lankan flight attendants and to describe the determinants of onboard injury.

Methods: A descriptive cross-sectional study was carried out among Sri Lankan flight attendants. All flight attendants undergoing their annual health and first aid training were invited to participate. Flight attendants who flew continuously for a six-month period prior to data collection were included in the study sample. Recall history of injuries for a period of six months was recorded.

Results: The study sample consisted of 98 (30.4%) male and 224 (69.6%) female flight attendants. Of the total sample, 128 (39.8%) cabin crew members reported an injury in the six months preceding the study. This represents a total injury incidence of 795 per 1000 person years. The leading causes of injury was pulling, pushing or lifting (60.2%). The commonest type of injuries were strains and sprains (52.3%). Turbulence related injuries were reported by 38 (29.7%) flight attendants. The upper limbs (44.5%) and the back (32%) were the commonest sites affected. Female flight attendants had 2.9 times higher risk (95%CI 1.2-7.2) of sustaining and injury than males. Irrespective of sex, body weight less than 56

kilograms (OR 2.9, 95%CI 1.4-5.8) and less than seven years of on board experience (OR 10.5, 95%CI 3.6-31.0) were associated with higher risk of injury.

Conclusions: Work related injury is a major occupational hazard to flight attendants. Appropriate preventive strategies are required to minimize them.

OT23-5

Oxidative Stress Biomarkers Level in Bangladeshi Women Exposed to Inorganic Arsenic through Drinking Water

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Introduction: Arsenic acts as a carcinogen may be due to oxidative stress induction through the generation of reactive oxygen species (ROS).

Methods: To investigate the relationship between urinary arsenic and urinary oxidative stress markers, 8-OHdG and 15-F2t-IsoP were evaluated in arsenic-exposed Bangladeshi residents. One hundred thirteen women from arsenic-exposed area and 115 women from control area were participated.

Measurements: Urinary arsenic was measured by ICP-MS (Agilent 7500ce). Urinary 8-OHdG concentrations were measured by HPLC-ED (EICOM, JAPAN) and 8-isoprostanes were measured by ELISA (Oxford Biomedical Research, Oxford, MI). **Results:** Urinary arsenic and oxidative stress markers were significantly higher in As-exposed group than control ($p < 0.001$). Urinary arsenic was significantly correlated with 8-OHdG ($r = 0.40$; $p < 0.001$) and urinary 15-F2t-IsoP ($r = 0.33$; $p < 0.001$).

Conclusion: These results suggested that arsenic-exposure increase oxidative stress in Bangladeshi women.

OT23-6

Data Mining Approach to the Analysis of Risk Factors for Chronic Diseases among Workers

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The prevention of chronic diseases among workers is an increasingly important public health issue in Korea because 25% of the entire population is workers and they are rapidly aging as the entire population is becoming older. Accordingly, workplace health promotion (WHP) is becoming an important approach to improving workers' health. With the goal of providing information for WHP, this study identified the modifiable (i.e., lifestyle) risk factors for chronic diseases by using data mining method. Risk factors were identified by using logistic regression and a decision tree, which is a data