

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

mining method for predicting risk factors. In addition, the predictive powers for the two methods were compared to demonstrate the effectiveness of data mining in analyzing a large data set. In the analysis, 293,144 workers in 200 workplaces from the 2007 health examination data were analyzed for two chronic diseases: hypertension and diabetes. The results showed that smoking and exercise were important factors influencing these chronic diseases. Specifically, smoking, exercise, and age between 45 and 54 were significant factors for hypertension, while smoking, exercise, and job type (office work or production work) were significant factors for diabetes. In contrast to previous studies, decision tree analysis gave more accurate results than logistic regression in predicting hypertension and diabetes, showing that data mining can be a useful analytic tool for predicting chronic diseases. Further, it provides segment-specific information on risk factors to support WHP for the specific target group.

OT23-7**Water-Related Environmental Health Problems in Bangladesh**

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Background: Bangladesh, a hugely populated, riverine country and the largest delta in the world, is gradually facing tremendous adverse consequences of water-related problems. Objective: This paper aims to articulate the common health problems with evidence and case studies in relation with water. Materials and methods: Ample scientific articles including case studies, newspaper articles, social reports and discussion were reviewed.

Result: Rainfall, high or low, is interlinked with instigation of diseases like malaria, dengue or hepatitis. There are complex relationships with problems of water quality, availability, sanitation, and hygiene. Extreme weather—floods or droughts-- increase the risk. Decrease in water supplies lower the efficiency of local sewerage systems and increase concentration of pathogenic organisms. Diarrheal diseases have two peaks-- pre and post monsoon. Cholera cases are reported mainly in the warmest season. Arsenic is another threatening problem. Floods are the most common natural disaster, specially of 1974, 1988, 1998 and 2004. With climate change, rainfall and sea level rise are expected to increase the frequency and intensity of floods. Flood-related injuries and mental problems are increasing. Other problems includes keratitis, skin diseases and helminthiasis. Besides, poor agriculture, salinity intrusion, drainage congestion, cyclone and storm surge and draught; in turn affecting health.

Conclusion: Safe water is in MDGs and a basic human right. Water and sanitation problems needs proper care and support to achieve a sustainable development.

OT23-8**The Blood Lead Concentration and Hemoglobin Level of Gasoline Station Worker in Makassar City, Indonesia**

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The study aim to analyze the correlation of blood lead concentration and hemoglobin level. Age, working duration and exposure time, smoking habit, and consuming canned drink are thought as the contributing factors of blood lead concentration. The study was cross sectional study was conducted at 46 gasoline station workers in Makassar. The samples were selected using cluster random sampling. The data were analyzed by using chi square and multiple regression. The results indicate that the average blood lead level (33.7 µg/dl) is still in normal limit, whereas the hemoglobin level (12.9 µg/dl) decreases. The chi square analysis ($p < 0,05$) indicate that there is a correlation between the increase of lead level and decrease of hemoglobin level. Interaction with age (20-39 years), working time (≤ 8 hours/day), working duration (> 1 year), smoking habit 17 (81%) of which the Pb and Hb are abnormal, and habit to consume canned drink 16 (80%) of which the Pb and Hb are abnormal. The multiple regression analysis indicated that working duration and smoking habit have an interaction between lead level and hemoglobin level. It could be concluded that working duration and smoking habit were the highest factors contributing to increased lead concentration and to decreased hemoglobin level of the blood gasoline station workers

OT23-9**How Sand Storms Impact the Environmental and Human Health in Taiwan**

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How sand storms impact the environmental and human health in Taiwan Winston Dang(1), Yu Chi Chu(2), Shuenn Chin Chang(2) (1).Taipei Medical University (2).Taiwan EPA* Abstract: Seasonal winds and high-pressure systems are moving dust with air pollutants (Lin et al., 2005), mercury and dioxin from China to Taiwan (approximately 60-70% to Korea and Japan area, 30-40% to Taiwan). With worsening desertification in China and climate change, China's dust storms are increasing in frequency and intensity. Dust storm frequency from China are have increased nine-fold since 1994, once annually in 1994 to nine times per year 2004. On the average, there are four to five dust events and 6.1 dust days in a year in Taiwan (Liu et al., 2006). On April 25, 2009 Taiwan experienced the highest PM10

(Particulate Matters) in the history reached 1000 $\mu\text{g}/\text{m}^3$ (Chang, 2009). China's rapid industrial growth has led to steep increases of air pollutant emission. In addition to high increases in the density of PM₁₀ during the dust storms, mercury, copper, sulfur dioxide, sulfates levels have become more prominent in long-range transport of air pollutants. In comparison of daily dioxin level to the day of sand storm, the level has almost double in PCDD/F content (Chi et al., 2008). Chang et al. (2009) indicated that the concentrations of atmospheric PCDD/F and mercury could be as high as 69.8 fg-I-TEQ/ m^3 and 4.18 ng/ m^3 , respectively, during the Northeast monsoon episode. It reveals that the importance of hazardous atmospheric pollutants concentration via long-range transports in air quality management and health concern. Studies between 2003-2004 (Wu et al., 2007; Wu et al., 2004) indicated that there is also a higher density of fungus in Northern part of Taiwan during sand storms, including Non-sporulating Fungi, Cladosporium, Penicillium, Aspergillus and Curvularia. Some species have been found to only exist when sand storm attacked: such as Botrysporium and Trichothecium. Several studies indicated that the presence of sandstorms may be associated with increased risk of hospital admissions or even increase more respiratory death cases. Exposure to ambient air pollution may be associated with increased risk of respiratory and cardiovascular hospital admissions in Taipei and other regions with similar air pollution episode (Chen et al., 2004, Yang et al., 2005, Chan et al., 2008, Bell et al., 2008). How to prevent the sand storms impact the environmental and human health in Taiwan become a major issue in policy decision process for the Government. *The views expressed in this paper are author's and do not reflect official positions of the Taiwan Environmental Protection Administration.

Oral Track 24- Occupational & Environmental Health

OT24-1

Rising Concerns of Occupational Health in Mongolia: Analysis of Incidence Rates of Occupational Diseases During 1986-2006

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Objective: The industrialization of Mongolia over the last two decades has raised a concern on occupational health. The purpose was to determine the incidence rates and time trends of major occupational diseases in Mongolia.

Method: We retrieved information from all 4598 patients who were diagnosed and registered as having occupational diseases by the National Research Center of Workplace Condition and Occupational Diseases (NRCWOD) in Mongolia during 1976-2005.

Results: The annual incidence rate per million person-years of occupation-related respiratory diseases (ORD) was increased by almost 2 times, musculoskeletal diseases by 5 times, and skin diseases by 4 times during the study period. Pneumoconiosis decreased slightly, but asthma and dust related chronic bronchitis nearly tripled. Although the cumulative incidence rates in workers aged 30-59 years (CIR30-59) of ORD have been decreasing from 8.03% to 2.90% per year in the workers with high-exposures, total numbers of newly developed ORD has increased about 3 times, indicating more people employed in such industries and the need for proactive prevention. Moreover, the incidence rates of ORD for the non-exposed and low-exposed workers also increased.

Conclusion: Numbers of occupational diseases have increased during the last two decades because of expanded employment in industrial sectors. Actions must be taken immediately to allocate more resources for the development of health manpower on early recognition and prevention of occupational diseases, establishment of a comprehensive hazard communication system, and the enforcement of all regulations.

OT24-2

Birth Month, Mold, and Risk of Atopic Dermatitis in Early Infancy

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Background: Several studies have found the association between month of birth and the development of allergic diseases. Knowledge concerning the effect of the interaction between perinatal indoor conditions and seasonality on atopic dermatitis is limited.

Objects: To evaluate the seasonality of atopic dermatitis (AD) in Taiwan and find out the potential lead role of indoor conditions in the effect of seasonality

Methods: 21248 infants born in 2005, who had participated in the Taiwan Birth Cohort Study, were evaluated at 6 months of age by questionnaires completed by their parent or caregivers. Multivariate logistic regressions were used to adjust gestational age, maternal age, gender, parental education, family income, and parental atopic history. Two stage analysis was used to calculate adjusted incidence of AD in each month of birth.

Main Result: Total 1467(6.9%) infants had atopic dermatitis before six months of age. Month-of-births distribution of AD children was significantly different from non-AD references. In AD children, month-of-births distribution of AD children with mold on wall in their house was significantly different from those living without mold. After adjustment, fall, summer, and winter pose higher risks of AD compared to