discriminant analysis, the sensitivity was 88.0%, specificity was 67.9%, accuracy was 80.8%, and ROC-AUC was 0.91 (95% CI: 0.85 to 0.97) in the training set. In the validation set, the sensitivity was 66.7%, specificity was 71.4%, accuracy was 70.0%, and ROC-AUC was 0.86 (95% CI: 0.69 to 1.00).

Discussion Breath test may have potential in screening for pneumoconiosis. A multi-centre study is warranted to establish a reliable model and the procedures must be standardised to prevent confounding factors before clinical application.

ASBESTOSIS AND GENE-ENVIRONMENT INTERACTIONS

Introduction Although the causal relationship between asbestosis and asbestos exposure has been well proved, little is known about the genetic factors that may influence the development of this disease. This study investigated the influence of gene-gene and gene-environment interactions on the risk of developing asbestosis.

Methods The nested case-control study included 262 cases with asbestosis and 265 controls with no asbestos-related disease studied for MnSOD, ECsOD, CAT, GSTT1, GSTM1, GSTP1, and iNOS polymorphisms. Data on cumulative asbestos exposure and smoking were available for all subjects. PCR based methods were used for genotyping. Logistic regression analysis was used to assess asbestosis risk.

Result The OR of asbestosis was 3.21 (95% CI: 2.43 to 4.23) for cumulative asbestos exposure; 0.98 (95% CI: 0.69 to 1.39) for smoking; 1.50 (95% CI: 1.01 to 2.24) for MnSOD –9Ala/Ala versus Ala/Val and Val/Val; 1.63 (95% CI: 0.62 to 4.27) for ECsOD 213Arg/Gly versus Arg/Arg; 1.36 (95% CI: 0.70 to 2.62) for CAT –262TT versus CT and CC; 1.20 (95% CI: 0.85 to 1.69) for iNOS LL versus SL and SS; 1.01 (95% CI: 0.71 to 1.43) for GSTM1-null; 0.61 (95% CI: 0.40 to 0.94) for GSTT1-null; 1.52 (95% CI: 1.08 to 2.15) for GSTP1 105Ile/Ile versus 105Ile/Val and 105Val/Val; and 0.97 (95% CI: 0.64 to 1.48) for GSTP1 114Ala/Ala versus 114Ala/ Val and 114Val/Val. The associations between MnSOD Ala–9Val polymorphism and asbestosis, and between iNOS genotypes and asbestosis (p=0.038) were modified by CAT–262C>A polymorphism (p=0.031). A strong interaction was found between GSTM1-null polymorphism and smoking (p=0.007), iNOS (CCTTT)n polymorphism and smoking (p=0.054) as well as between iNOS (CCTTT)n polymorphism and cumulative asbestos exposure (p=0.037).

Discussion The findings suggest that in addition to asbestos exposure the interactions between different genotypes, genotypes and smoking, and between genotypes and asbestos exposure have an important influence on developing asbestosis and should be considered seriously in future research on occupational/environmental asbestos-related diseases.

802 SPIROMETRY LONGITUDINAL DATA ANALYSIS SOFTWARE (SPIROLA) FOR RESPIRATORY DISEASE PREVENTION AMONG SHIPYARD WELDERS IN SOUTH KOREA

Introduction Workplace health monitoring using periodic spirometry has been recommended as a tool for prevention of respiratory disease. The Spirometry Longitudinal Data Analysis (SPIROLA) software is an integrated visual and quantitative tool to aid in monitoring lung function in individuals participating in spirometry-based health monitoring programs developed by Centres for Disease Control and Prevention (CDC).

Methods We analysed the annual lung function decline in 385 male workers of the Korean Shipyard Welder Cohorts by SPIROLA. To evaluate the annual decline of spirometry data, we analysed the longitudinal spirometry data collected from 2010 through the year 2015 in workers who had at least four follow-up tests. We estimated each person’s rate of FEV1 and FVC decline and group’s rate of FEV1 and FVC decline.

Result The results on 385 workers with 4 or more years of follow-up showed that the mean rate of FEV1 decline was higher than that for the Korean population. And decline of lung function in welders suggest a greater effect in smoking status.

Discussion This study indicates the need for respiratory disease prevention and intervention in this shipyard welders. The computerised annual lung function decline program is very useful of workers’ respiratory health prevention. So We need to develop a program suitable for workplace environment in Korean.

890 WORK-RELATED ASTHMA AMONGST ASTHMATIC PATIENTS IN THE EASY ASTHMA CLINICS IN KHON KAEN, THAILAND

Introduction Work-related asthma (WRA) amongst asthmatic patients in worldwide country are about 15%–25%. In Thailand, there are at least 3 million asthmatics patients but there have never been a figure of WRA presented. This is the first study in Thailand where a proportion of WRA amongst asthmatic patients was figured.

Methods A descriptive study was performed. The samples of 523 asthmatic patients in the Easy Asthma Clinics were
interviewed in order to obtain information related to onset of asthma and suspected cause of asthma. Four questions related to WRA included:

- history of asthma symptoms which get well when away from work or on holidays
- history of asthma symptoms which get worsened during the working days
- evidence of the sensitising or irritant agents in workplace that have been previously studied causing WRA
- evidence of exposure to the sensitising or irritant agents in workplace that have been previously studied causing WRA.

Descriptive statistics was used for analysis of data.

Results

The proportion of WRA amongst asthmatic patients was 16.3%. Of those with WRA, 69.0% were new-onset asthma (87.9% were occupational asthma (OA) and 12.1% were reactive Airways dysfunction syndrome). The remaining 31% was work exacerbated asthma. The top three defined occupations were those working in the manufacturing, ground cleaning/waste management services and personal care and services, respectively. Considering the agents, top three agents were chloramine, metal fume and wood dust, respectively.

Conclusion

The current study showed a similar result reported elsewhere where 16.3% of asthmatic patients were WRA and as expected, OA contributed most. This finding encourages physicians to explore patients’ occupation and their job descriptions since they will help physicians to focus on WRA. Therefore early recognition of early-onset of WRA will help curing or improving asthma at last.

969 SMOKING AND PULMONARY ALTERATIONS IN RETIRED BUXAITE MINING WORKERS: A RETROSPECTIVE STUDY

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Introduction Retired bauxite mining workers have been at risk for developing lung diseases due to their long-term exposure to inhalation hazards. Smoking is known to decrease pulmonary function and cause lung disease. Smoking cessation may prevent these changes. This study aimed to evaluate whether smoking was associated with pulmonary changes in retired bauxite mining workers.

Methods A cross-sectional study involving the database information of 140 retired bauxite mining workers from Brazil evaluated at the Worker’s Health Reference Centre and Social Security National Institute, from July 2015 until June 2016. The workers were divided in 3 groups: smokers (n=47), non-smokers (n=47), and ex-smokers (n=46). The data included: gender, age, spirometric results (normal; altered results including mild, moderate or severe changes), and presence of pulmonary parenchymal alterations in chest x-rays. It was applied the Chi-Squared test with p<0.05.

Results All workers were male with mean age of 62 years-old. In the smokers group, 83% spirometry tests were altered (53% mild, 19% moderate and 11% with severe changes). In this group, 64% had altered chest x-rays. In the non-smokers group, 19% spirometry tests were altered (13% mild and 6% moderate changes). In this group, 13% had altered chest x-rays. In the ex-smokers group, 35% spirometry tests were altered (11% mild, 9% moderate and 15% severe changes). In this group, 30% had altered x-rays. All results were statistically significant, except for the mild changes in the non and ex-smokers groups.

Discussion These results demonstrated differences between the smokers and non-smokers groups in regard to spirometric and radiographic alterations. The ex-smokers group had improved results compared to the smokers group in regard to altered spirometric and chest x-rays findings. These data may contribute with strategies to enhance smoking cessation programs within the bauxite mining industry in order to prevent pulmonary changes in mining workers.