

Epidemiological study of health effect on stone workers of Hualien—Processing gemstone and nephrite had the highest risk

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Background and aim: Hualien is the main place of stone industry in Taiwan. The stone workers had been long-term exposed to some ores that contain quartz or asbestos. However, most of them work in small and unregistered factories. The health effect on these workers is unknown. The objective of study was to assess the pulmonary fibrotic changes in stone workers and evaluate the hazard of different works in stone industry.

Methods: We had completed 47 walk-through surveys of stone processing workplaces between 2006 and 2009. The work environment, processing procedures, materials used in each procedure were recorded. We grouped workers into 8 types of works, including processing gemstone, processing nephrite, making stone embellishment, making vase, making urn, make small stone decoration, artistic carving, and construction material factory. Each type of work was treated as a similar exposure group. A cross-sectional survey was performed in stone workers and their family of Hualien in 2010. The profusion of chest radiogram was graded complied with ILO/ICRP standard. Those who had profusion 1/1 or greater with lung crackle were identified as cases of pulmonary interstitial fibrosis. To prevent confounding, subjects were excluded when they had history of tuberculosis or other occupations that may cause lung fibrosis. Multivariate logistic regression was used.

Results: 328 subjects were enrolled for analysis. Among them, 17 subjects was identified as cases and the prevalence was 5.2%. After adjusting the pack-years of smoking and age, processing gemstone had the highest risk (OR=3.85, p=0.02), followed by processing nephrite (OR=3.10, p=0.05). By using employment less than 10 years as the reference group, the odds ratio of process gemstone more than 20 years was 6.62 (p<0.01) and the odds ratio of processing nephrite more than 20 years was 4.79 (p<0.01).

Conclusions: Processing gemstone and nephrite had the highest risk in stone industry.