

Project title:

**Measuring Impact of Smoking and Cessation on Lung
Cancer Mortality in Workers with Silicosis and
Systematic Review**

Final Report

(31 March, 2016)

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The work described in this report was substantially supported by a grant from Pneumoconiosis Compensation Fund Board of the Hong Kong Special Administrative Region, China.

Executive summary

Objective: To conduct a systematic review on the association of smoking and cessation with lung cancer risk in silicotic workers and evaluate the beneficial effect of smoking cessation on lung cancer mortality among workers with silicosis in a large historical cohort in Hong Kong.

Methods: We searched all the published cohort and case-control studies (including nested case-control studies) that illustrated the relationship between smoking cessation and lung cancer risks among silicotic patients in Medline and Embase (1966 – 2013). We extracted standardized mortality ratio (SMR), standardized incidence ratio (SIR), hazard ratio (HR) and their 95% confidence interval (95% CI) from each study and conducted meta-analysis to summarize pertinent evidence following international standards using approaches of evidence-based medicine. We recruited all 3202 incident cases of silicosis in Hong Kong from 1981 to 2005 and followed up them till 2014 to ascertain the underlying causes of death. We collected each worker's socio-demographics, completed occupational history and medical history at the baseline since 1981. In addition to smoking status at the baseline of recruitment, we further collected silicotic workers' smoking information during the follow-up period. The effect of smoking cessation was assessed based on the following categories: never smokers, persistent quitters, new quitters, and never quitters. Multiple Cox's regression and Cox's proportional hazard model incorporating nature cubic spline were performed to present the relationship of smoking and cessation on lung cancer mortality after adjustment of potential confounding factors.

Results: We found 5 eligible studies presenting the relationship between smoking cessation and lung cancer mortality among silicotic patients. The combined effect of lung cancer risk is 2.07 (95% CI: 1.44, 2.69) for former smokers. During 1981-2014, a total of 1984 deaths (62%) occurred and 196 of them were from lung cancer. Compared with never smokers, lung cancer mortality was strongly associated with never quitters (HR = 9.30, 95% CI: 3.41, 25.28), followed by new quitters (HR=4.59, 95% CI: 1.63, 12.87), and persistent quitters (HR = 4.51, 95% CI: 1.64, 12.40). A distinct decrease on lung cancer mortality was observed after the abstinence of smoking for 10 years, with a predominant reduction for those quitting smoking for 30 years or more (HR = 0.43, 95% CI: 0.27, 0.70), while such a decreased trend was further

demonstrated by a sophisticated cox proportional hazard model incorporating nature cubic spline.

Conclusions: This historical cohort study among silicotic workers in Hong Kong along with the results from meta-analysis support that smoking cessation has a beneficial effect on lung cancer mortality among workers with silicosis, with a significant impact for those who have quit smoking for 30 years or more. Despite a longer time window than the general population to demonstrate a beneficial effect after quitting, workers with silicosis are advised to quit smoking as early and persistent as possible.

Key words: silicosis, lung cancer, smoking cessation, effect, systematic review.