

Mesothelioma and Lung Cancer Among Motor Vehicle Mechanics: a Meta-analysis

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We conducted a systematic review and analysis of the epidemiological literature that examines the risk of lung cancer and mesothelioma among motor vehicle mechanics who may have been engaged in brake repair and, thus, were potentially exposed to asbestos. All relevant studies were classified into three tiers according to their quality. Tier III (lowest quality) studies were cited for completeness, but were not included in the meta-analysis. Meta relative risks (meta-RRs) were calculated for mesothelioma and lung cancer using both fixed and random effects models for Tiers I and II, separately, followed by stratified analyses based on study design or exposure characterization (garage workers versus brake workers) and, for lung cancer studies, based on adequate adjustment for smoking. The meta-analysis for Tier I (higher quality) and Tier II (lower quality) studies of mesothelioma yielded RR estimates of 0.92 (95% CI 0.55–1.56) and 0.81 (95% CI 0.52–1.28), respectively. Further stratification according to exposure characterization did not affect the results. The meta-analysis for lung cancer produced RR estimates of 1.07 (95% CI 0.88–1.31) for Tier I and 1.17 (95% CI 1.01–1.36) for Tier II. When the lung cancer analysis was limited to studies that used adequate control for smoking, the resulting RR estimate was 1.09 (95% CI 0.92–1.28). Based on these findings, we conclude that employment as a motor vehicle mechanic does not increase the risk of developing mesothelioma. Although some studies showed a small increase in risk of lung cancer among motor vehicle mechanics, the data on balance do not support a conclusion that lung cancer risk in this occupational group is related to asbestos exposure.

Keywords: asbestos; brakes; epidemiology; lung cancer; mesothelioma; meta-analysis; motor vehicle mechanics

INTRODUCTION

The causal association between inhaled asbestos fibers and the development of lung cancer is well established. While the causal role of amphibole asbestos in the development of mesothelioma is also clear, there is still disagreement regarding the dose-response relationship between chrysotile asbestos

and mesothelioma and the role of amphibole contaminants in that relationship (Hodgson and Darnton, 2000). Excess risk of these two cancers has not been found in all settings where there is potential exposure to asbestos. Recent attention has shifted from highly exposed occupational groups such as insulators and shipyard workers to those with asbestos exposures that could be both qualitatively and quantitatively different. One such occupation is motor vehicle repair, where exposure to short chrysotile fibers can occur during installation and repair of asbestos-containing brakes. (In North America, automobile

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