

A comparison of exposure assessment approaches: lung cancer and occupational asbestos exposure in a population-based case control study

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Studies examining health impacts of occupational carcinogens often collect exposure information directly from workers through questionnaires or checklists. While these methods are quick and inexpensive, the accuracy of this information is limited by workers' inability to accurately assess, recall and report exposures to specific agents. Inaccurate exposure information can obscure our ability to detect relationships between exposures and adverse health outcomes.

In a case-control study conducted in the Greater Toronto Area, Brenner, et al. (2010) failed to find an increased risk of lung cancer among workers who reported asbestos exposure. Exposure information in this study was based on self-report. In an interview, participants were asked, "In any of your jobs have you ever worked with asbestos?" This result was surprising since asbestos is a well-established lung carcinogen. We were concerned that the responses to this question may have been inaccurate.

To overcome the limitations of self-reported data in occupational health research, industrial hygienists have developed job-exposure matrices. Researchers can use these tools to objectively assign exposure based only on job title. Since this method does not depend on workers' recall, it may be more accurate than self-report.

The goal of this project was to compare two approaches to assessing occupational asbestos exposure. We were interested in determining if the association between asbestos exposure and lung cancer in the case-control study mentioned above differed when we applied a job-exposure matrix, the DOM-JEM, instead of self-reported information.

When we classified workers as exposed or unexposed to asbestos according to the DOM-JEM, we determined that many workers who reported that they had never been exposed to asbestos in the workplace, may have in fact been exposed. In our analyses, workers that self-reported exposure were not found to be at an increased risk of lung cancer compared to workers that self-reported they had never been exposed. However, when we used the DOM-JEM method, exposed workers were twice as likely to be diagnosed with lung cancer as unexposed workers. Thus, when we used the DOM-JEM approach we observed the expected result: occupational asbestos exposure increases the risk of lung cancer. This leads us to believe that the DOM-JEM may be a more accurate approach to exposure assessment than self-report.

These findings highlight the importance of carefully selecting methods for exposure assessment to allow us to accurately determine cancer risks in the workplace.

Brenner DR, Hung RJ, Tsao MS, Shepherd FA, Johnston MR, Narod S, et al. "Lung cancer risk in never-smokers: a population-based case-control study of epidemiologic risk factors." BMC Cancer 10 (2010):285.