Asbestos Exposure, Smoking, and Neoplasia

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Asbestos insulation workers, as a group, have a high risk of dying of bronchogenic carcinoma (about seven or eight times expected). We have observed 370 such workmen from Jan 1, 1963 to April 30, 1967. Our findings indicate that asbestos exposure alone is not the entire explanation. Of 87 noncigarette smokers, none died of bronchogenic carcinoma. Of 283 workmen with a history of regular cigarette smoking, 24 died of bronchogenic carcinoma, although only three were expected to die of this disease. Calculations suggest that asbestos workers who smoke have about 92 times the risk of dying of bronchogenic carcinoma as men who neither work with asbestos nor smoke cigarettes. We conclude that asbestos exposure should be minimized, that asbestos workers who do not smoke should never start, and that those now smoking should stop immediately.

In 1964, we reported on deaths occurring between Jan 1, 1943, and Dec 31, 1962, among 632 members of the International Association of Heat and Frost Insulators and Asbestos Workers.[1] All of these men had been occupationally exposed to asbestos dust for many years. Their death rate from lung cancer was found to be 6.8 times as high as that reported for the general white male population of the United States during the same years, with age taken into consideration. Three of the men died of diffuse pleural mesothelioma and one died of a neoplasm histologically suggestive of peritoneal mesothelioma. This was of interest since mesothelioma is a very rare disease in the general population but is reported to be associated with exposure to asbestos dust.[2] In addition, their death rate from cancer of the stomach, colon, and rectum was higher than expected; but this may have been due to chance, the number of such deaths being small. During the latter part of the study, we obtained information on the smoking habits of most of the survivors, but we could not obtain reliable information on the smoking habits of those who had died at an earlier date. Therefore, we could not at that time investigate death rates in relation to smoking habits and exposure to asbestos dust which were considered both separately and jointly.

There is abundant evidence that cigarette smoking leads to a high rate of death from lung cancer in the absence of occupational exposure to asbestos dust.[3-7] Our findings outlined above suggested (but did not prove) that exposure to asbestos dust may lead to a high rate of death from lung cancer in the absence of cigarette smoking. If the latter be so, then the combined effect of both types of exposure might or might not be equal to or greater than the sum of the two effects. On the other hand, it was possible that exposure to asbestos dust increases the risk of lung cancer among cigarette smokers but does not lead to lung cancer among nonsmokers.

The present study was undertaken primarily to investigate these possibilities. In addition, we wished to obtain more information on the occurrence of mesothelioma and gastrointestinal cancer among asbestos workers.

Material

From records of New York Local 12 and Newark, NJ, Local 32 of the International Association of Heat and Frost Insulators and Asbestos Workers, a list was made of every man who was a member of either one of these locals on Dec 31, 1942, or who joined between that date and Dec 31, 1962. No one was omitted regardless of his subsequent work history.

Personnel data from union records indicated that of the 632 on the union rolls on Jan 1, 1943, 339 of the men had first been occupationally exposed to asbestos dust prior to 1922, and an additional

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Read before a joint meeting of the Section on Diseases of the Chest with the Section on Preventive Medicine and the American College of Chest Physicians at the 116th annual convention of the American Medical Association, Atlantic City, NJ, June 19, 1967.

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