Familial Mesothelioma After Intense Asbestos Exposure at Home

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MESOTHELIOMA is primarily an occupational disease of asbestos workers, but the neoplasm may also develop after intense exposure to asbestos outside the workplace.[1] This report of pleural mesotheliomas in the wife and a daughter of an asbestos handler suggests that gross asbestos contamination of the home can be a serious health hazard.

Report of Cases

Patient 1 (Figure), the father, worked as a pipe insulator at a shipyard for approximately 25 years (1940 to 1965). Pulmonary asbestosis was diagnosed at age 60 years in 1966. He also smoked one to two packs of cigarettes daily for several decades. In 1977, metastatic adenocarcinoma in the left upper lobe of the lung developed and the patient died. Findings from an autopsy demonstrated severe pulmonary asbestosis and lung cancer.

Patient 2, the mother, was in good health until a right pleural effusion developed in 1967 at age 50 years. A right thoracotomy and a pleural biopsy specimen showed a mesothelioma. She was not a cigarette smoker and had not experienced occupational exposures to asbestos. She failed to respond to radiotherapy to the right thorax and died in August 1968. An autopsy was not performed.

Patient 3, a daughter, was born in 1943. A right pleural effusion developed at 34 years of age in 1977. Thoracentesis and a pleural biopsy specimen revealed a mesothelioma. The patient had lived throughout childhood in her parents' home, and later worked in clerical and secretarial jobs without exposure to asbestos or chemical agents. She had been in good health except for a suspected pulmonary embolism in 1974, which was attributed to oral contraceptive ingestion. She had intermittently smoked several cigarettes a day for approximately 15 years.

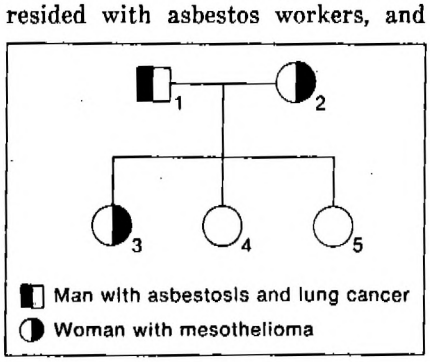
The two younger daughters in the family were examined after the diagnosis of mesothelioma in their sister. Patient 4, a 30-year-old housewife, showed slightly prominent lung markings in the chest roentgenogram, but pleural or pulmonary disease could not be diagnosed. Patient 5 (aged 23 years) had normal clinical and roentgenographic findings.

The father had installed asbestos insulation on ships, and his exposure to dusts was reported to be particularly intense during World War II and several years thereafter. Family members stated that when he returned home, his work clothes were often covered with a whitish, powdery layer of dust. The mother shook the soiled clothes on the porch, laundered them in the kitchen, and dried them on a line; her children played nearby. Family members denied other sources of intense exposure to asbestos. There was no history of consanguinity or cancer among other close relatives. The family lived for many years in a clean, residential, middle-class neighborhood located approximately 6 km from the shipyard.

Review of the histopathologic characteristics confirms the diagnosis of mesothelioma in the mother and daughter. The daughter's tumor had a biphasic or mixed pattern of epithelial-type cells with papillary formations, gland-like spaces, and spindle cell metaplasia. Mitoses were numerous; mucicarmine stains were negative. The mother's tumor had a similar appearance, though fibrosis was more extensive.

Comment

Mesotheliomas usually develop in older men with a history of occupational exposure to asbestos several decades before diagnosis.[1] However, Anderson et al[2] recently reported mesotheliomas in four persons who resided with asbestos workers, and summarized 33 published cases of mesothelioma after domestic exposure to asbestos; none of the persons had contact with the fiber at work. The data on these 37 patients were fragmentary and showed that 27 (82%) of 33 were women and that mesothelioma was diagnosed in 11 (50%) of 22 before 50 years of age. The preponderance of women and young patients can be explained by asbestos exposure during laundering of dusty work clothes in ten patients, and during childhood in 11.



Pedigree of family.

It is possible that asbestos did not cause the mesotheliomas in patients 2 and 3, since exposure to the agent cannot be identified in the histories of all mesothelioma patients. On the other hand, the dosage of asbestos to induce mesothelioma in susceptible persons may be low and hardly noticed. Several studies[1] have implicated pollution from asbestos mines and factories in the development of mesothelioma among residents in the neighborhood. In the present family, three cancers can be attributed to asbestos from the shipyard. The father had lung cancer, which develops with particularly high frequency among asbestos workers who are also cigarette smokers.[3] In addition, he had carried asbestos on his work clothes into his home. Mesotheliomas subsequently developed in both his wife, who laundered the clothing, and his daughter who was exposed during childhood. No other source of intense asbestos exposure was identified. Contributing factors may include genetic susceptibility to cancer among family members and exposure at an early age in patient 3. The younger daughters in the family had shorter and perhaps less-intense exposure to asbestos. They are presently free of cancer, but the latent period of asbestos-associated mesothelioma is often more than three decades.[1] Thus, long-term surveillance for cancer in these patients is needed.

References

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