

FILE NAME: Jewelers (JEWEL)

DATE: 1988

DOC#: JEWEL006

DOCUMENT DESCRIPTION: Published Journal Article – Page 1 only

MEDICAL INTELLIGENCE



MALIGNANT MESOTHELIOMA

A Cluster in a Native American Pueblo

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THE association between malignant mesothelioma and asbestos exposure is well known.¹⁻³ Often the exposure is not obvious, and careful clinical and epidemiologic investigations are required to identify it. We recently investigated five cases of this tumor in a Native American pueblo of approximately 2000 persons. A unique juxtaposition of cultural customs with the presence of an industrial plant exposed this population to asbestos.

Malignant mesothelioma was diagnosed in three patients at the Public Health Service Hospital in Santa Fe, New Mexico, between April 1984 and September 1985. A search of the state tumor registry revealed that two additional patients had had this type of tumor between 1970 and 1982. All five (three men and two women) were from the same pueblo, which had no known exposure to asbestos. At the time of diagnosis their average age was 65, and the average period of survival between diagnosis and death was 3.8 months.

The expected incidence of mesothelioma, calculated with data supplied by the Surveillance, Epidemiology, and End Results network, was found to be 0.003 case per year for a community of this size. Because its occurrence in the pueblo was 1000 times the expected one, an epidemiologic investigation was undertaken by the Environmental Health Services Department of the Santa Fe Indian Health Service Hospital. The survey revealed that exposure to asbestos had probably occurred during the manufacture of silver jewelry or the preparation of leather leggings and moccasins worn during ceremonial dances.

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The opinions expressed are the authors' and are not to be construed as those of the United States Public Health Service.

METHODS OF INVESTIGATION

For the purposes of this investigation, a case of malignant mesothelioma was defined as any case so designated by the New Mexico Tumor Registry and confirmed by a pathologist's analysis of histologic samples. Medical records were reviewed for each deceased patient to confirm his or her home of record and declared occupation.

A questionnaire was administered to family, friends, and one surviving patient to determine the source and duration of asbestos exposure. Questions about occupations with demonstrated asbestos exposure were included in the questionnaire, along with questions about traditional Indian livelihoods such as raising livestock, farming, and craft work.^{4,5}

On the basis of the results of the questionnaire and personal interviews, 14 items from the homes of patients and the workrooms of Native American silversmiths were selected for analysis of asbestos content. Nine of the samples collected were materials used to whiten deerskin leggings for ceremonial occasions, two samples were whiteners for traditional Indian pottery, and three samples were silversmith supplies.

Polarized light-microscopical analysis identified 10 of the 14 samples as containing mixed-fiber asbestos. Chrysotile asbestos was found in concentrations above 33 percent in 55 percent of the samples, amosite was found in 30 percent of the samples, and crocidolite was found in 20 percent of the samples. Most of the material collected was felted from pipes or asbestos boards.

OCCUPATIONAL AND CULTURAL EXPOSURES

Asbestos was found to be an integral component in the preparation of silver jewelry by Native American craftsmen. A random survey of American Indian silversmiths in the Southwest revealed that they all use asbestos because of its well-known insulating properties as well as its ready availability and low cost. Asbestos mats, called pounding boards by the Indians, are used to insulate worktables against the intense heat of brazing torches and molten metal. Frequent use of these boards causes a buildup of silver slag that must be cleaned periodically. Cleaning is achieved by clapping the boards and rubbing the working surfaces together — actions that scrub the slag off the board and simultaneously aerosolize asbestos fibers into the breathing zone of the craftsman. This cleaning procedure is performed without benefit of respirators, dust masks, or ventilation.

A second source of exposure was the process of whitening leggings and moccasins. Pueblo Indians celebrate religious feasts by dressing in traditional attire made of animal pelts, beads, and deer hides. Hundreds of dancers often dance in alternating groups (clans) from dawn to dusk. Asbestos is used liberally to whiten buckskin leggings and moccasins before each dance. The dancers scrub these articles with