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Asbestos dust is linked to disease

BREATHING asbestos dust causes or is associated with three diseases—asbestosis, lung cancer, and mesothelioma. Scientists have also found some evidence linking asbestos exposure to gastrointestinal cancer.

Asbestosis is one of a group of lung diseases called pneumoconioses caused by dust inhalation. It is similar to black lung contracted by coal workers from breathing coal dust.

Asbestosis starts when inhaled asbestos fibers are trapped in the lower portion of the lungs. The asbestos is indestructible in the lung, and normal lung-cleaning mechanisms don't work. The lungs become scarred, and the scarring, which can be seen with an X-ray, reduces the amount of space in the lungs where circulating blood can pick up oxygen. In extreme cases, a disabling shortness of breath results. In addition, there may be a strain on the heart in its effort to pick up sufficient oxygen to circulate enough blood.

The time between the first exposure to asbestos and the first manifestations of asbestosis averages 17 years and is called the latency period. According to studies by Dr. Irving J. Selikoff of Mt. Sinai School of Medicine, approximately 1 in 10 asbestos workers dies from asbestosis. There is no cure.

Lung cancer, according to Dr. Selikoff, accounts for 2 in 10 deaths among asbestos workers. This is more than 5 times the expected rate in the United States population. Dr. Selikoff also found that smoking greatly increases the risk of lung cancer among asbestos workers. Asbestos workers who smoke have 8 times the risk of lung cancer compared to asbestos workers who do not smoke, and 90 times the risk of people not exposed to asbestos and who do not smoke. The latency period for asbestos-related cancer is 20 to 30 years.

Mesothelioma is a rare cancer of the pleura (lining of the lungs and chest cavity) or peritoneum (lining of the abdominal cavity). In the 1960's, scientists estimated that mesothelioma caused only 1 in every 10,000 deaths. In contrast, Dr. Selikoff found among asbestos workers mesothelioma causing 1 in every 10 deaths. The latency period for mesothelioma is 30 to 40 years. Many of the arguments for a zero-fiber limit on asbestos are based on reports that even single or occasional exposures to asbestos may cause mesothelioma.

Gastrointestinal cancers of the stomach, colon, and rectum have also been associated with asbestos exposure. In one study, Dr. Selikoff reported 29 of 255 deaths among asbestos workers due to gastrointestinal cancer. Only 9.4 deaths from these cancers would be expected from a normal group of 255 men selected at random.

Scientists disagree

Although the first reported case of asbestosis occurred in 1906, most of the current knowledge on asbestos was developed during the last 10 years. Despite recent progress, however, several medical mysteries about asbestos-related disease remain.

There are three types of asbestos most used commercially. Each has a different chemical formula and each, some scientists think, has different cancer causing abilities. Chrysotile asbestos accounts for 95 percent of asbestos used commercially in the United States and appears to be the least likely to cause mesothelioma. Crocidolite and amosite asbestos, also used commercially, appear to be more dangerous. Scientists cannot explain the difference.

Scientists also don't know how asbestos causes cancer. Some scientists think that somehow the structure of the asbestos fibers themselves causes cancer. Others think that trace metals in the asbestos are the cause. Nickel and chromium, known carcinogens, are common impurities in asbestos. One school of scientists hold that asbestos may work as a cocarcinogen, and, with another agent such as cigarette smoking bring on cancer.

The mystery that most divides scientists is the reported higher rates of asbestos-related disease among workers employed in manufacturing and construction than among a comparably exposed group of workers employed in mining and milling. Dr. Selikoff's studies of asbestos insulation and factory workers show death rates 25 to 50 percent higher than a comparable but non-exposed group of workers. In contrast, Dr. J. Corbett McDonald of the Department of Epidemiology and Health at McGill University, in a study of mining and milling workers in Quebec's chrysotile asbestos mines, found the overall death rate among asbestos workers slightly lower than the normal death rate for the province. In the highest dust category in McDonald's study, comprising 5 percent of the persons studied, he found the death rate only 20 percent higher than for a normal population. Dr. Selikoff found 22 cases of mesothelioma among 632 asbestos workers in his study. Dr. McDonald found only 3 cases among 9,981 workers in his study. Scientists cannot explain the difference in results. ■