Case Reports

Asbestosis and Bronchogenic Carcinoma*

Report of One Autopsied Case and Review of the Available Literature

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THERE are several reasons for presenting in detail a case report and a review of the available literature dealing with the relationship between occupational exposure to asbestos and respiratory tract malignancy. The apparent increase in bronchogenic carcinoma, especially in males, reported in the past decade has led to scrutiny of respirable dusts as possible etiology. Most English observers[1–3] are satisfied that there is a statistically significant increase in pulmonary malignancy among asbestos workers. Some American writers consider that the experience to date does not support this contention.[4,5] The work of Graham,[6,7] Doll and Hill,[8] and Ochsner[9,10] has created much interest in the correlation of cigarette smoking with bronchogenic carcinoma. E. R., whose case is herein presented, was exposed to harmful amounts of asbestos dust and was a chain smoker. This provides speculation as to the possible role of two etiologic agents.

Few reported cases of lung cancer related to industrial asbestos exposures provide data on the character and quantity of dust exposure. This is a serious deficit in exact study of etiologic correlation. In the clinical report presented herein State authorities have determined by measurement that the asbestos dust exposure of this man during his twelve years of work was considerably above the safe level, which is considered to be five million particles per cubic foot of air for an eight-hour working day.

It is pertinent to this presentation that there are probably about 10,000 workers engaged in potentially hazardous asbestos manufacturing operations in the United States.[11] Middleton reports the number in Great Britain as between 3,000 to 5,000.[12] Most of the industry is engaged in asbestos textile manufacturing producing insulating mattresses, brake linings, fire proof curtains and clothing. The chief operations are disintegration of the crude mineral, carding the fiber, separating the more useful long from the short fiber, spinning, plaiting and weaving the asbestos, often with cotton. Insulating material is produced by mixing magnesia, diatomaceous earth and other materials with asbestos to make cements or fillings for insulating boilers, engines and pipes. Other non-textile asbestos products so made include asbestos cement, sheets, brake and clutch linings, electrodes and switchboard panels.

Asbestos is a hydrated magnesium silicate. The chief supplies are in Canada, Cape Province, Italy, Rhodesia and Russia. Asbestos dust given off in manufacturing processes consists of fragments of fibers and small rounded or angular particles. Actual studies in industry show the size and shape of the particles of asbestos to be such as may gain entrance into the bronchioles.[14] Experience has led to the acceptance of five million particles of asbestos per cubic foot of air, of small enough size to be respirable, to be the safe working concentration.

Some operations because of their dustiness are more hazardous than others in asbestos manufacturing. Bagging the asbestos, separating the long from the short fibers, carding, spinning and weaving show a greater statistical evidence of asbestosis than do other operations. As might be expected, the longer the duration of exposure the greater the number of cases. In the Merewether and Price series there was one case under four years' exposure, and up to 53.6 per cent with fifteen to nineteen years' exposure.[15]

CASE REPORT

E. R. (MGH #735586),[16] a forty-one year old asbestos mill worker, entered the Massachusetts General Hospital in April, 1951. The chief

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