

In the USA Enterline et al (1973) studied the mortality experience in retirees from the asbestos industry. After adjustment for cumulative dust exposure, men exposed only to chrysotile revealed a respiratory cancer mortality (not distinguished between bronchial carcinoma and mesothelioma) 2.4 times the expected; exposure to a combination of chrysotile and crocidolite increased the ratio to 5.3. Asbestos cement industry workers only exposed to chrysotile showed a respiratory cancer mortality ratio of 1.4; those exposed to mixed chrysotile and crocidolite had a ratio of 6.1.

These data lead to the conclusion that in relation to mesothelioma crocidolite is more carcinogenic than chrysotile or amosite. This is in agreement with the Report of the Advisory Committee on Asbestos Cancers (IARC 1973).

In rat experiments (Wagner et al 1973) mesotheliomas were observed after intrapleural inoculation with all types of asbestos and other non-asbestos fibrous materials. In asbestos a considerable proportion of animals developed mesothelioma - this happened in lesser proportions with the other materials as aluminium silicate, glass fibres, etc. The risk of developing pleural mesothelioma after injection was proportional to the dose. The chemical properties of the fibres proved to have a minor influence in developing the tumor; their physical properties appear to be responsible for carcinogenesis. Pott et al (1972a, b) came to the same conclusion after intraperitoneal injection of fibrous materials in rats and the following development of tumors. In these animal experiments fibres reach the pleural and peritoneal cavity in a distinctly unnatural way; in asbestos exposed human beings one has clearly to realize the role of these physical properties in relation to the possibility of the various types of fibres reaching the target organs in sufficient quantities.

Stanton (1973) reported the results of experiments in rats of applying various types of asbestos, fibrous glass and fibrous aluminium oxide to the pleural cavity by open thoracotomy. The incidence of pleural mesothelioma showed that the carcinogenicity seems to be related to fibre-sizes $<2.5\mu$ in diameter and $10-18\mu$ in length. Present evidence (not yet published) suggests that fibres about 0.25μ and 1.5μ in diameter and between 10 and 60μ length, may be especially important. No tumours developed if crocidolite or chrysotile were pulverized to a non-fibrous form. So the structural properties determine to a great extent whether inhaled asbestos is deposited in the lung, and whether

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