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Inhaled cellulosic and plastic fibers found in human lung tissue.

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Abstract

We report the results of studies undertaken to determine whether inhaled plant (i.e., cellulosic; e.g., cotton) and plastic (e.g., polyester) fibers are present in human lungs and, if so, whether inhaled fibers are also present in human lung cancers. Specimens of lung cancer of different histological types and adjacent nonneoplastic lung tissue were obtained from patients undergoing a lung resection for removal of a tumor. With the protection of a laminar flow hood and safeguards to prevent contamination by extraneous fibers, fresh, nonfixed, and nonstained samples of lung tissue were compressed between two glass microscope slides. Specimens in these dual slide chambers were examined with a microscope configured to permit viewing with white light, fluorescent light, polarizing light, and phase-contrast illumination. Near-term fetal bovine lungs and nonlung human tumors were used as controls. In contrast to the observations of these control tissues, morphologically heterogeneous fibers were seen repetitively in freshly excised human lung tissue using polarized light. Inhaled fibers were present in 83% of nonneoplastic lung specimens (n = 67/81) and in 97% of malignant lung specimens (n = 32/33). Thus, of the 114 human lung specimens examined, fibers were observed in 99 (87%). Examination of histopathology slides of lung tissue with polarized light confirmed the presence of inhaled cellulosic and plastic fibers. Of 160 surgical histopathology lung tissue slides, 17 were selected for critical examination; of these, fibers were identified in 13 slides. The inhalation of mineral (e.g., asbestos) fibers has been described by many investigators; we believe,

however, that this is the first report of inhaled nonmineral (e.g., plant and plastic) fibers. **These bioresistant and biopersistent cellulosic and plastic fibers are candidate agents contributing to the risk of lung cancer.**

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