

DETECTION OF ASBESTOS AND OTHER SILICATES IN THE URINE OF GENERAL POPULATION AND IN NORMAL AND CANCEROUS HUMAN KIDNEY AND VESICAL TISSUES

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The presence of asbestos and other silicates in urine and in bladder/kidney tissues can be used as an indicator of environmental and/or occupational exposure to minerals via inhalation and ingestion (GUILLEMIN et al., 1989; POLLICE et al., 1995; FINN & HALLENBACK, 1984). Mineralogical analyses are suitable to assess the intensity of exposure when data from other sources are unavailable or unreliable.

The purpose of this research was to prove the feasibility of using optical microscopy and SEM/EDX to detect asbestos and other silicate fibres in neoplastic and non-neoplastic kidney/bladder tissues and in urine. The urine of the following persons were analysed: (1) a 66-year-old woman with kidney cancer surgery and paraoccupational asbestos exposure; (2) a 6-year-old child with environmental asbestos exposure; (3) a 43-year-old woman with environmental asbestos exposure and without neoplasia; (4) a 62-year-old man with pleural mesothelioma and without asbestos exposure. Besides, (a) cancerous and normal kidney tissue of a patient without asbestos exposure, (b) transitional cancerous and normal bladder tissue of a patient without asbestos exposure and (c), as control, autoptical normal bladder tissue of an adult were analysed.

The results show that (i) while silicates are present in all cases, asbestos occurs only in two cases of urine and kidney/bladder tissue samples, with the higher concentration in the neoplastic kidney tissue; (ii) confirm previous data reported in literature (PATEL-MANDLIK, 1981; KOBAYASHI et al., 1987; ROGGLI et al., 1986) and (iii) suggest a possible role of asbestos in urological neoplasia, especially in the kidney. However, only three studies of human material are available in literature and they cannot be statistically significant to detect an excess mortality due to kidney cancer among workers professionally exposed, thus further research is necessary.

References

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