

PostScript

LETTER

Monitoring of fluoro-edenite fibre pollution through the study of sheep lymph nodes as a model of a biological indicator

A significantly increased standardised rate of mortality from pleural mesothelioma, comparable to that reported in asbestos exposed cohorts, has been recorded in Biancavilla (SW slope of Mt Etna, Sicily)^{1,2} and attributed to exposure to fluoro-edenite, a fibrous amphibole found in the inert material extracted from a nearby stone quarry.¹

It is well known that sheep lung is anatomically and physiologically comparable to human lung,³ and lymph nodes are considered better indicators of previous asbestos exposure than lung parenchyma.⁴

We therefore measured the concentration of fluoro-edenite fibres in the lymph nodes (tracheobronchial and one middle mediastinal node) draining the lung lobes of sheep habitually grazing 3 km from the town using histology (haematoxylin-eosin and Perls method), light (LM) and scanning electron microscopy (SEM), as well as an energy dispersion spectrometry x ray analysis apparatus in order to assess the pollution due to airborne dust material.

Sixty healthy sheep randomly selected from six flocks (10/flock) and 10 control sheep were sacrificed.

Histology showed hyperplasia of lymphoid follicles, which had large reactive cores. Numerous paracortical macrophages noted

among clusters of lymphoid elements contained grey-brownish amorphous particulate with elements with a fibril structure.

SEM analysis of digested nodes evidenced some naked fibres with the crystallochemical features of fluoro-edenite.¹

Fibre length (range 8–41 µm) and diameter (range 0.4–1.39 µm) were similar to those described in the lung of a Biancavilla housewife who died from pleural mesothelioma.²

Fibres were found in all exposed animals, but never in control nodes. The mean number of fibres ($0.08 \pm 0.04 \times 10^6$ fibres/g dry tissue) did not differ significantly among exposed animals.

Results are preliminary and document the risk of inhalation of fluoro-edenite fibres a few kilometres from the town. Similar data have been reported by DeNardo and co-workers,⁵ who however studied solely lung tissue from sheep with a shorter (roughly half) time of exposure which had been grazing in a limited area around the town.

Data show that sheep can be effective biological indicators of this type of pollution; assessment of fluoro-edenite fibres in lymph nodes therefore appears to be a helpful tool to conduct its environmental monitoring.

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