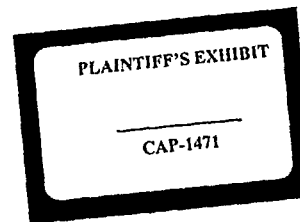




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Sartorelli, E., Zedda, S., Aresini, G. & Ghezzi, I.:

Respiratory physiopathology of asbestosis (Italian)
(Fisiopatologia respiratoria dell'asbestosi)

La Medicina del Lavoro, 63 (7-8): 269-281, July-August 1972

ABSTRACT

A study of the respiratory function was carried out in 724 male subjects exposed to inhalation of asbestos dust (workers of a mining company of chrysotile in Piedmont; insulators; workers engaged in the production of asbestos-cement, of asbestos textiles or of car brakes and friction clutch discs). In all subjects the vital capacity, VEMS and D_{LCO} at rest (steady state method) were determined. In some cases they measured the residual volume, the resistances of the airways (body pletismography), of respiratory dead space, of arterio-alveolar CO_2 gradient and also of D_{LCO} at work on a cycloergometer. The subjects were subdivided into 5 groups on the basis of the chest X-ray pattern (UICC classification, Cincinnati): 1st group with X-ray pattern 0/0 or 0/1 and with asbestos exposure less than 10 years (average exposure 5.7 years); 2nd group with X-ray pattern 0/0 or 0/1 and with asbestos exposure longer than 10 years (average exposure 21.2 years); 3rd group with X-rays 1/0 or 1/1; 4th group with X-rays 1/2, 2/1 or 2/2; 5th group with X-rays 2/3, 3/2 or 3/3.

The results obtained can be summarized as follows. A ventilation insufficiency restrictive in type was observed in 5.6% subjects of the 1st group, in 10.1% subjects of the 2nd group and in 31.1%, 41.9% and 69.2% subjects of the 3rd, 4th and 5th group respectively. The finding of a ventilation insufficiency restrictive in type in a non-neglectable percentage of subjects exposed to asbestos, but with chest X-ray

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findings normal or dubious, seems to indicate the existence in these cases of pulmonary lesions still not detectable radiologically, but that nonetheless have already determined a change in lung elasticity. A ventilatory insufficiency obstructive in type, due to chronic bronchitis with or without lung emphysema, was observed in percentages variable from 11.2% to 24.2% according to the group considered. In subjects with a chest X-ray pattern diagnostic of a severe asbestosis, evident changes of the rate ventilation/perfusion (increased respiratory dead space and a-A CO₂ gradient) were often present. A reduction of D_LCO at rest and/or at work, below the lowest normal limits (defined from the study of 91 normal male subjects), was observed in 4.6 to 6.4% subjects of the 1st group, in 9.6 to 19.2% subjects of the second group and in percentage higher than 20% (up to 100%) in the subjects of the 3rd, 4th and 5th group. The finding of pathological values of D_LCO both at rest and at work, in a certain number of subjects exposed to asbestos, but without radiological changes or with X-ray changes insufficient for a clear-cut diagnosis of asbestosis, indicated that the pulmonary lesions induced by asbestos can determine evident functional changes of the alveolar-capillary gas exchanges also in a pre-radiological phase. In conclusion, the study of the respiratory function in workers exposed to asbestos offers useful data not only for an evaluation of the functional damage present in the subjects with an asbestosis evident at X-rays, but also for an early diagnosis, and therefore for the prevention of asbestotic pneumoconiosis.

"Authors' summary"