Reprinted from: BIOLOGICAL EFFECTS OF MINERAL FIBRES, Vol. 2
J. C. WAGNER
Lyon, *(IARC Scientific Publications No 30)* 1980

DISCUSSION SUMMARY

H.C. LEWINSOHN

Raybestos-Manhattan Inc.,
Trumbull, CT, USA

Eleven papers were selected for discussion in this session and reviewed by the principal speaker, Dr Böhlig. In opening the discussion, he pointed out that these papers were mainly of an epidemiological, rather than a purely clinical or radiological, nature.

Discussion took place on use of radiology as a diagnostic tool, its precise use in the diagnosis of pleural abnormalities, its value in the recognition of the progression of observed changes and the value of nonradiological indicators. The effect of different fibre types and their influence on clinical and radiological response was mentioned briefly.

The diagnostic criteria applied are dependent, to some extent, on the purpose for which the diagnosis is being made. If the main purpose is individual patient care, rather than epidemiological studies of groups of workers, then the manner in which films are interpreted assumes a different level of importance. A paper which illustrated very well the problems involved in measuring radiological change in a large group of workers, and the difficulties encountered in the analysis of X-ray readings, originated from the national survey of asbestos workers in the UK; this drew attention to the negative aspects rather than to the positive strength of the survey. In this study, problems encountered related to inter- and intra-observer variabilities in X-ray reading, geographic dispersion of readers and the time frame of the study. The biases which crept in resulted in negative radiological progression, and this led to the need to revise the study methodology.

In contrast to the disappointing results thus far obtained in that study, it was pointed out that in another study in Canada, given all the weaknesses inherent in reading films, the presence of abnormal findings was a reasonable predictor of mortality. Even changes of 0/1 profusion of irregular small opacities carry the risk of increased mortality. It was pointed out that this only applied to studies of large numbers of X-rays and required the use of three trained readers: it was not directly applicable in the daily physician/patient relationship as a prognostic tool.

In the mines and mills where nonfibrous mineral dust is present, X-ray changes may include a significant number of evenly-distributed, small, rounded opacities, which apparently have no sinister significance.

Discussion then ensued with regard to the value of clinical, radiological and physiological techniques as tools for the medical surveillance of asbestos-exposed populations. Issues relating to the prognostic value of such tools were raised; it was felt by some that individuals with a poor prognosis and increased cancer risk who exhibited radiological change could continue to work under modern conditions in industry with much lower levels of exposure than those which existed in the past. The reason given was that the cancer risk, if any, probably related to the higher levels experienced under poor conditions in the past, and that small increments would have no further effect. This point of view was challenged vigorously, and it was pointed out that because mortality and morbidity are both dose-related, small increments of dose were bound to increase the risk, taking into account any additional lag period. Additional dose can be equated with additional risk.

Because it is not known whether there is a possible link between malignant mesothelioma of the pleura and radiological pleural abnormalities and whether such abnormalities are of prognostic significance, more precise tools are needed for the radiological definition of pleural changes. A valuable technique appears to be the use of computer tomography in the differential diagnosis of asbestos-induced pleural thickening. The value of diaphragmatic straightness as an indicator of unsuspected diaphragmatic pleural thickening or pleural plaques was discussed: straightness of the diaphragm is frequently seen not only in cases of pulmonary fibrosis, but also, for example, in persons with obstructive airways disease.

The sign could be due to the 'stiffness' in the lung rather than to 'stiffness' in the pleura, and cannot be accepted at this stage, on the basis of the evidence presented, as a reliable sign in the diagnosis of asbestos-related pleural disease. Further study is indicated to confirm the value of this observation in asbestos-exposed populations.

A significant conclusion reached was that whereas parenchymal changes on X-rays were related to dust concentration, pleural changes were related to length of exposure, irrespective of dose. It was suggested that pleural changes probably represented an important radiological sign, forming part of a constellation of changes observed in low-grade exposure groups where parenchymal changes were less likely to be observed. To illustrate this point, findings in amosite plant workers, household contacts of asbestos workers and chemical plant maintenance workers, all of whom exhibited pleural changes, were presented and discussed. Critical comments were forthcoming in view of the lack of quantitative environmental exposure data in these studies and the reliance on assumptions of exposure derived from job-descriptions or interview information. To supplement the data on groups exposed indirectly, reference was made to the consistent finding of pleural abnormalities in shipyard populations surveyed in various countries.

The work of Edge, which indicated the possibility that pleural plaques observed in shipyard workers were associated with an excess incidence of mesothelioma, was discussed, and it was concluded that the apparent risk originally detected was due to the fact that the analysis was based on a biased population sample derived from patients attending a chest clinic for treatment which then led to retrospective study of the X-ray appearances.

A pathologist's view was that when asbestos exposure is low pleural plaques are seen fairly commonly. As radiological techniques are improved, pleural plaques will be seen with greater frequency and will approach the numbers which pathologists have been accustomed to see for some time. The main value, in the pathologist's view, of the presence of pleural plaques is that it demands more careful examination of the lung. Parenchymal disease is very rarely found in these cases, as opposed to its common occurrence in association with malignant disease.

An important point which arose in the discussion was that plaques and diffuse pleural thickening are of different epidemiological significance. The present ILO U/C classification of radiographs for pneumoconiosis does not enable differentiation between plaques and diffuse thickening. This difficulty should disappear when the new, 1980 ILO classification comes into general use.

Various studies of radiological appearances in asbestos-exposed populations confirm that progression of pleural thickening is dependent upon length of exposure, whereas that of parenchymal opacities is dependent upon concentration and cumulative exposure. Pleural abnormalities continue to progress with age, irrespective of further exposure, while parenchymal abnormalities progress as a function of increments to lifetime exposure.

Nonradiological indicators were discussed, and their value as adjuvants to radiology in the diagnosis of asbestosis was debated. The justification put forward for paying closer attention to such findings as asbestos bodies and siderocytes in the sputum, basal rales, restrictive ventilatory insufficiency and impairment of alveolar-capillary diffusion was the fact that, as asbestosis is progressive and irreversible, early effects may occur in the lungs before radiological appearances alter. It was emphasized that sole reliance could not be placed on any one indicator alone, and only a combination of these findings would possibly enable an earlier diagnosis of asbestos-related pulmonary disease.

Discussion on the question of asbestos bodies confirmed the accepted viewpoint that they should merely be regarded as an index of exposure and not of disease. In the presence of other nonradiological indicators, however, they were part of the confirmatory evidence utilized for the diagnosis of asbestosis.

It was pointed out that not all so-called 'asbestos bodies' necessarily had asbestos fibre cores, and they should be examined to confirm the presence of asbestos in them, especially in view of the increasing use of other fibres in industry. The point of view was also expressed that asbestos bodies are largely an indication of exposure to amphibole fibres and that chrysotile fibres produce very few bodies.

Further information is required on the prognostic significance of pleural disease, and more precise radio logical definition is needed. Studies of large populations that rely on radiological interpretation may suffer from the

effects of inter- and intra-observer variability, unless they are carefully controlled by means of standardized techniques, training of readers and a clearly defined time frame. Studies are required to determine more precisely the effects of removal of affected workers from further exposure and to determine the prognostic significance of observed radiological changes in those persons who continue to be exposed to low levels in modern industry.

The question of compensation for asbestos-related disease was discussed briefly. It is obvious that until international guidelines are defined more precisely, some deserving cases will not be accepted for compensation, while others without disablement or significant disease may benefit. Clinical and radiological observations have two main objectives, namely (1) use in research leading to improved medical surveillance and prevention of disease, and (2) use in making medico-legal decisions in matters of compensation of disabled workers. An opinion was expressed that illness should be compensated for the 'risque social' and not merely for the 'risque professionnel'.