

subjective sign which will be elicited in different ways by different observers according to the quality of their stethoscopes, the degree of presbycusis from which they suffer and the ability of the patient to breathe in a controlled manner.

Progressive Radiological Changes

X-ray technology and classifications of pneumoconioses have changed considerably during the past 46 years since Merewether surveyed workers in the asbestos textile industry. The radiological criteria which he used to diagnose asbestosis are not defined in his report.

Radiological changes considered significant in the diagnosis of asbestosis by the BOHS Committee were increased general opacity of the lower lobes, blurring of the cardiac outline, pleural thickening and adhesions. Isolated areas of calcification, unconnected with the above changes, were not considered as necessarily or probably asbestotic in this series.

It appears likely that Merewether and the BOHS Committee were concerned with relatively far-advanced disease.

The BOHS Committee recognized the onset of the disease to be gradual and hence difficult to define. All the features of the disease may occur to varying degree and, indeed, the severity of the alteration of the separate features may well be related to the type of past dust exposure. Thus the particular set of criteria used to decide whether asbestosis is present or absent will vary.

Various systems of classification have been used to attempt to standardize the description of radiological opacities. The International Labor Office's 1959 Classification⁶ was, until recently, the most widely used but had certain difficulties with regard to asbestosis. The classification was recently modified by a UICC working group and extended to include irregular opacities such as occur in asbestosis as well as other abnormalities.⁷ The ILO/UC International Classification of Radiographs of Pneumoconiosis, 1971,⁸ is designed to describe "persistent radiological opacities in the lung fields provoked by mineral dust" and to allow them to be categorized according to size and shape and to indicate their profusion or extent in the lung fields. A set of standard films illustrating all categories is issued by the ILO.

Confirmatory Measurements of Altered Lung Function

Lung function tests have three main uses, namely: (a) To establish base-line values in order to assess lung function, periodically using each worker as his/her own control. (b) To confirm the clinical and radiological diagnosis. (c) To assist in the assessment of disability in established disease.

It is not proposed to discuss (a) and (c) but merely to describe briefly the value of lung function tests in confirming the diagnosis. According to Bader et al⁹ in asbestos workers vital capacity reduction precedes category 2 or 3 radiological changes by 10 to 15 years; the latter changes do not occur until 20 years of exposure. After 30 years of exposure, the incidence of functional and radiographic abnormalities is approximately the same.

The tests most readily used according to Becklake et al.,¹⁰ are those of ventilatory capacity, which include measurement of the FEV₁, FVC and FEV₁/FVC%.

Lung volumes and gas transfer should be measured in all suspected cases to obtain confirmatory evidence of pulmonary fibrosis.

General Remarks

An attempt has been made to indicate that asbestosis is not an

easy condition to diagnose. It requires intimate knowledge of the industry and the use of its products. The view is shared by Elmes who, in relation to a particular case which he diagnosed as asbestosis of nonoccupational origin, has subsequently published an account of the autopsy findings indicating that his diagnosis was incorrect. The diagnosis established at autopsy in this case was chronic active fibrocasseous tuberculosis.¹¹

Asbestosis is not a clear-cut entity except in the advanced stages of disease and very often a mistaken diagnosis can be made which, if communicated to the individual concerned before all diagnostic avenues have been explored and the disease confirmed, can lead to psychological stress and breed ill-will in a community. It is sound practice in the United Kingdom to discuss all suspected cases with the Members of the Pneumoconiosis Medical Panel and to accept their judgment with regard to diagnosis. There may be a few people who have some, but not all, diagnostic criteria, who are not considered to be suffering from asbestosis. Many of these cases are elderly and on the verge of retirement. They are symptom-free, their earning capacity is not affected and they are unable to find alternative work if they have to change jobs.

Furthermore, the dust conditions which probably produced the slight changes in their x-rays should no longer exist and they should now be employed in conditions where the Asbestos Regulations, 1969 ensure their safety. Unless they develop symptoms, or clinical findings indicate definite changes, there does not appear to be any need to take further action. The first indication of deterioration must elicit a rapid response leading to immediate further investigation, diagnosis and appropriate compensation.

In the interpretation of lung function test results it should be borne in mind that there is a wide range of "normality" for most available measurements made and it is thus important to establish for each individual worker a "normal" base-line value prior to exposure and to observe deviation from the base-line in order to assess deterioration of lung function during his working lifetime. The measurement of FEV₁ and FVC, is a simple procedure and the test equipment available is robust, transportable and dependable. The use of lung function tests in the future in the surveillance of asbestos workers is obvious and should form an essential part of any preventative medical programme.

Physiological tests alone cannot prove the diagnosis of asbestosis, but merely the abnormal pattern of lung function which characterises diffuse pulmonary fibrosis from any cause. In combination with occupational history, physical signs and radiological changes they give confirmatory evidence of the presence of the disease and assist in assessing its severity. They are essential in the investigation of suspected asbestosis.

A number of points arise as a result of the increasingly widespread use of the ILO U/C Classification of radiographs. The commonest changes recorded by most observers are in category 1 and relate to irregular small opacities. It would appear that the presence of irregular small opacities in smokers can significantly affect the interpretation of x-rays and that in the older age group these changes can also occur.¹⁴

The significance of category 1 (irregular small opacities in asbestos workers working in low dust concentrations), unless demonstrated to be related to cumulative dust exposure when reviewed on a serial basis, cannot yet be determined. There is no clear-cut dividing line between early change and disease. The diagnosis of asbestosis should not be made purely on the basis of a slight alteration in radiological appearance and in the absence of serial review radiographs, a history of asbestos exposure (including