BOHS COMMENTS ON THE DRAFT DAMAGES (ASBESTOS-RELATED CONDITIONS) (SCOTLAND)) BILL

Summary

Asbestos-related pleural plaques are asymptomatic and are not an indicator of any increased risk of other asbestos disease. Conventional chest X-rays are an unreliable way of diagnosing this condition and the preferred approach would be to use computed tomography (CT), which has a much greater level of radiation exposure than a conventional chest X-ray. In order to minimise unnecessary exposure to radiation, the British Occupational Hygiene Society believes that there should be a screening protocol to minimise the population radiation dose from CT scans carried out solely to identify pleural plaques. This screening procedure should be based on the relative risk of the diagnostic procedure versus the risk of asbestos related disease. It should include information about the previous asbestos exposure of the individual, particularly the time since first exposure and the likely intensity of exposure.

The British Occupational Hygiene Society (BOHS)

The British Occupational Hygiene Society (BOHS) is a learned society with the objects of improving scientific knowledge and practice in the prevention of ill health from occupational and environmental hazards. Its members are drawn from a wide range of multidisciplinary specialities and include leading academics and practitioners in the field. Our organisation includes the Faculty of Occupational Hygiene, which provides examinations and qualifications in occupational hygiene. Our publication, the Annals of Occupational Hygiene is acknowledged as one of the leading global scientific journals in the field.

Comments on the draft Bill

1. If this Bill is introduced there should be a system for identifying those persons likely to have had sufficient asbestos exposures to develop pleural plaques. This is essential to minimize unnecessary exposure of potential claimants to ionizing radiation from chest CT scans.

2. In assessing the need for radiographic investigations it is necessary to be aware of the relative reliability of conventional chest radiograph and computed tomography (CT) scans in identifying the presence of pleural plaques.

Hillerdal (1994) commented regarding pleural plaques that: “They are always more widespread and more numerous at autopsy than seen on the roentgenogram, and in fact only 10-15% are seen with conventional radiography.” Parkes (1994) commented that: “Computed tomography is capable of detecting pleural plaques in the lateral pleura which are invisible on conventional radiographs …” and “high-resolution CT (HRCT) is helpful in diagnosing subpleural fat (a cause of wrong diagnosis in 10 to 20% of patients thought to have plaques on plain radiography …” Light (2001) commented that: “Conventional and high-resolution CT scans are more sensitive at detecting pleural plaques than is the standard chest radiograph. In one study of 159 asbestos-exposed workers with a normal chest radiograph, pleural plaques were detected in 59 (37.1%) by CT scan. … Focal plaques are commonly observed in the posterior and paraspinous regions of the thorax, areas that are poorly seen on chest radiographs”. Seaton (2000) commented that: “Moreover, pleural fat pads and companion shadows may easily be mistaken for plaques, leading to a tendency for false-positive diagnoses. Thus diagnosis of fibrous plaques by routine chest radiography is unreliable. … In cases of doubt, and where the additional radiation is considered justifiable, CT proves a reliable means of diagnosing and defining the extent of plaques.”

It can be concluded that CT scans are not only more sensitive in detecting pleural plaques than conventional chest radiography but are also able to differentiate between pleural plaques and other health conditions that can be mistaken for pleural plaques when using conventional chest radiography.

CT scans are therefore the preferred diagnostic tool for pleural plaques.

3. It is essential to appreciate that the radiation dose to which the patient is exposed during a CT scan is substantially higher than that during a conventional chest X-ray.

   For example, the Health Protection Agency (2008) publishes a table on Patient Dose information on its website. The following information has been abstracted from that table:

X-ray examination	Typical effective doses (mSv)	Equivalent period of natural background radiation	Lifetime additional risk of fatal cancer per examination
Chest (single PA film)	0.02	3 days	1 in a million
CT chest	8	3.6 years	1 in 2500

   Note: Approximate risk for patients 16-69 years old; for geriatric patients divide risks by about 5.

4. As the HPA information indicates the risk is strongly associated with the age of the person at the time they receive their CT scan and for people aged 55 years and above is probably about an order of magnitude lower than the average risk for patients between 16 and 69 years (Brenner and Hall, 2007). However, there is no clear health benefit associated with the risk from these investigations and so it could be argued that any radiation exposure is unnecessary in relation to potential health benefits.

5. As can be seen from the above table a CT chest scan exposes the patient to about a 400 times higher radiation dose than a conventional chest X-ray and produces an additional risk of 1 in 2,500 of developing a fatal cancer. Given the possible high number of people seeking compensation it is inevitable that some will ultimately die as a consequence of the diagnostic investigations.

   It is therefore suggested that to minimize the ionizing radiation risk associated with CT scans undertaken to determine whether a patient has developed pleural plaques, there should be criteria to select only those individuals with sufficient asbestos exposures to have a chance to have developed pleural plaques or other more serious asbestos-related disease.

6. The BOHS believe that it is not appropriate to look for plaques in individuals who have had slight exposure to asbestos, for example less than 0.1 fibres/ml for at least a year, or in people who were exposed less than 10 to 20 years ago. In addition, people exposed to amphibole asbestos would be more likely to have asbestos-related pleural plaques. This group would also be more likelyto have an increased risk for mesothelioma.

7. Hillerdal (1997) commented that a typical feature of pleural plaques is their slow progression, that many plaques are not seen until long after a person was first exposed to asbestos. Hillerdal (1991) reported that the mean latency of pleural plaques in a study in Sweden was 33 years. Light (2001) cites data from Epler and his co-workers describing the incidence of pleural plaques in a population of 1,135 patients who had been exposed to asbestos: within 10 years of first exposure, there were no plaques; after 20 years, a 10% incidence; after 40 years, over 50% incidence; with a mean of 33 years between initial exposure to asbestos and development of pleural plaques identified. The same author comments that plaques "usually calcify within several years of becoming evident radiologically and that calcification rarely occurs within the first 20 years of initial exposure to asbestos, but that by 40 years over one third of such individuals have calcified pleural plaques.

8. Light (2001) cites Epler *et al* as noting that pleural effusions occur sooner after asbestos exposure than do pleural plaques or pleural calcification and that in the study noted above, many patients developed pleural effusions within 5 years of the initial exposure, and all did so within 20 years of the initial exposure. That is, it could be considered that a history of pleural effusions subsequent to likely exposure to asbestos could be a marker that such exposures had occurred.

   It must be appreciated that not all patients with pleural effusions would have gone to their GP. The importance of having a history of pleural effusions would therefore be as positive information to reinforce a history of exposure to asbestos rather the lack of such a history being a means of excluding some claimants.

9. The BOHS suggest that there should be a protocol for the diagnosis of asbestos-related pleural plaques and the other conditions covered by the Bill. The purpose of the protocol should be to identify those who are likely to have plaques, based on their previous asbestos exposure and possible history of pleural effusions subsequent to their initial likely exposure to asbestos, so that they can then go forward for medical investigations. The criteria for screening could be based on the length of time since an individual was first exposed to asbestos and the intensity of their exposure (based on an investigation of the possibility of relevant exposure to asbestos by a competent person using a consensus methodology, which we propose should be developed). This approach would have the benefit

of minimizing unnecessary exposure to ionizing radiation from the medical diagnostic investigations. There may also be a net benefit for these individuals in detecting more serious asbestos-related disease.

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