Introduction: Inhalation of asbestos fibers is known to cause two main kinds of cancer—mesothelioma and lung cancer. While the vast majority of mesothelioma cases are generally accepted as being caused by asbestos, the proportion of asbestos-related lung cancers is less clear and cannot be determined directly because cases are not clinically distinguishable from those due to other causes. The aim of this study was to estimate the number of asbestos-related lung cancers among males by modeling their relative lung cancer mortality among occupations within Great Britain in terms of smoking habits, mesothelioma mortality (as an index of asbestos exposure) and occupation type (as a proxy for socio-economic factors).

Methods: Proportional mortality ratios for lung cancer and mesothelioma for the 20-year period from 1980 to 2000 (excluding 1981) were calculated for occupational groups. Smoking indicators were developed from three General Household Surveys carried out during the 1980s and 1990s. Poisson regression models were used to estimate the number of asbestos-related lung cancers by estimating the number of lung cancer deaths in each occupation assuming no asbestos exposure and subtracting this from the actual predicted number of lung cancer deaths.

Results: The effect of asbestos exposure in predicting lung cancer mortality was weak in comparison to smoking habits and occupation type. The proportion of current smokers in occupational groups and average age at which they started smoking were particularly important factors. Our estimate of the number of asbestos-related lung cancers was between two-thirds and one death for every mesothelioma death: equivalent to between 11,500 and 16,500 deaths during the time period studied.

Conclusions: Asbestos-related lung cancer is likely to have accounted for 2-3% of all lung cancer deaths among males in Great Britain over the last two decades of the 20th century. Asbestos-related lung cancers are likely to remain an important component of the total number of lung cancer deaths in the future as part of the legacy of past asbestos exposures in occupational settings.
Factsheet on Asbestos and Asbestos-Related Diseases

Annotation

Fact 1
• In an exercise to estimate the proportion of asbestos-related lung cancers among all lung cancers, the total number of asbestos-related lung cancer deaths among males between 1980 and 2000 (excluding 1981) in Great Britain was about 11,500.

Fact 2
• The total number of mesothelioma deaths among males was 17,491 of which about 16,500 are likely to be due to asbestos exposure (assuming 1,000 background cases).

Fact 3
• An estimate of the ratio of the number of asbestos-related lung cancer to mesothelioma deaths was about 0.7.

Fact 4
• Asbestos-related lung cancer is likely to have accounted for 2-3% of all lung cancer deaths among males in Great Britain between 1980 and 2000 (excluding 1981).

Fact 5
• The mesothelioma PMR (Proportional Mortality Ratio) relating to zero asbestos exposure is not equal to zero since there is evidence to suggest that there are about 100 mesothelioma deaths each year in Great Britain not linked to asbestos exposure, with roughly equal numbers occurring in males and females, which is the so-called ‘background’ level of mortality.

References