

Commentary

OccIDEAS: An Innovative Tool to Assess Past Asbestos Exposure in the Australian Mesothelioma Registry

Ewan MacFARLANE¹, Geza BENKE¹, Malcolm R SIM¹ and Lin FRITSCHI²¹Monash Centre for Occupational and Environmental Health, Monash University, Melbourne²Western Australian Institute for Medical Research, The University of Western Australia, Perth, Australia

Malignant mesothelioma is an uncommon but rapidly fatal disease for which the principal aetiological agent is exposure to asbestos. Mesothelioma is of particular significance in Australia where asbestos use was very widespread from the 1950s until the 1980s. Exposure to asbestos includes occupational exposure associated with working with asbestos or in workplaces where asbestos is used and also 'take-home' exposure of family members of asbestos exposed workers. Asbestos exposure may also be non-occupational, occurring as a consequence of using asbestos products in non-occupational contexts and passive exposure is also possible, such as exposure to asbestos products in the built environment or proximity to an environmental source of exposure, for example an asbestos production plant. The extremely long latency period for this disease makes exposure assessment problematic in the context of a mesothelioma registry. OccIDEAS, a recently developed online tool for retrospective exposure assessment, has been adapted for use in the Australian Mesothelioma Registry (AMR) to enable systematic retrospective exposure assessment of consenting cases. Twelve occupational questionnaire modules and one non-occupational module have been developed for the AMR, which form the basis of structured interviews using OccIDEAS, which also stores collected data and provides a framework for generating metrics of exposure.

Key Words: Asbestos, Occupational exposure, Mesothelioma, Environmental exposure, Carcinogens

Introduction

Malignant mesothelioma is an uncommon cancer of the mesothelium, a membrane which forms a lining of the thorax, peritoneum and pericardium. Most mesotheliomas are associated with the pleural mesothelium, the lining of the lungs. About 80% of mesotheliomas in the developed world are in individuals known to have higher than background exposure to asbestos

[1,2]. The possibility of unrecognised exposure exists in other cases [3,4]. Although mesothelioma is an uncommon tumour, it is aggressive and resistant to treatment and is uniformly and rapidly fatal [5-7].

Asbestos exposure is the principal etiological agent for mesothelioma. Asbestos is a naturally occurring mineral product and comes in a variety of forms, several of which have had commercial uses, including the serpentine mineral chrysotile ("white asbestos") and the amphibole minerals amosite ("brown asbestos"), crocidolite ("blue asbestos"), tremolite, anthophyllite and actinolite. The earliest epidemiological evidence for an association between mesothelioma and asbestos was in relation to crocidolite, however, current consensus is that all forms of asbestos are carcinogenic, although the different mineral subtypes do not present equal risk [8-10].

Received: August 30, 2011, **Revised:** October 11, 2011

Accepted: October 13, 2011, **Available online:** March 8, 2012

Correspondence to: Ewan MacFARLANE

Monash Centre for Occupational and Environmental Health

School of Public Health and Preventive Medicine

The Alfred Hospital, Commercial Rd, Melbourne 3004, Australia

Tel: +61-9903-0593, **Fax:** +61-9903-0556

E-mail: Ewan.MacFarlane@monash.edu.au

While the background incidence of mesothelioma is very low, the occurrence has been increasing since the 1950s and there is considerable inter-country variation, ranging from 7 per million (Japan) to 40 per million in Australia and this variation appears to be consistent with differences in historical asbestos exposure patterns [1,11]. Australia has one of the highest reported incidences of mesothelioma in the world, and this is consistent with the local history of high past asbestos use in occupational and environmental settings [3-5]. In countries where asbestos use has been phased out the increasing incidence over past decades can be expected to peak in the foreseeable future [1,11] and in Australia this peak is projected to occur around 2015-2020 [4,12].

The majority of mesotheliomas occur in males [13], and differences in exposure-profiles of men and women are likely to be important factors in this difference, with occupational exposure more common in males than females [14]. Analyses of mesothelioma incidence rates among residents and workers at a remote crocidolite mine and the associated mining town (Wittenoom) in Western Australia suggest that women may have a steeper dose-response curve than men [15].

Although it is well-established that asbestos is the main exposure relevant to the aetiology of mesothelioma, the very long latency of this disease (mean 40 years, range 15-97 years) [1] presents particular problems for exposure assessment. In general, retrospective assessment of occupational exposure in community-based studies has often been crude and subject to considerable misclassification [16]. Assessment of exposures in the very distant past is usually hampered by a lack of extant records of exposure measurement and in community-based studies exposure assessment must therefore often make use of information from the participants themselves [17]. This is especially problematic for a very long latency disease like mesothelioma.

The purpose of this paper is to provide an overview of asbestos exposure, particularly in the Australian population, and to describe how the OccIDEAS exposure assessment tool is being adapted for use in the Australian Mesothelioma Registry to retrospectively assess asbestos exposure among mesothelioma cases. OccIDEAS is a tool which can be used for exposure assessment in a wide variety of different research contexts, including studies of new exposure-disease combinations.

Sources of Asbestos Exposure

Sources of asbestos exposure can be classified into three broad categories. Firstly, occupational exposure is that which occurs in the workplace or in the course of work-related activities.

Occupational exposure includes obvious exposures of workers who are using or handling asbestos fibre, manufacturing or using asbestos-containing products; it also includes passive exposures associated with working in an area where asbestos fibres are present. The second category of exposure is known as “take home” exposure and this occurs when an exposed worker’s family experiences exposure to asbestos carried home on the worker’s clothes. The third category is environmental (non-occupational) exposure. Like occupational exposures, environmental exposures may arise as a result of actual use of asbestos containing products outside the workplace, but the possibility also exists of passive environmental exposure, associated with being in environments where asbestos fibres are present, for example where asbestos building materials are present or proximity to asbestos mining or processing sites.

Historical occupational exposure to asbestos in Australia has been well described elsewhere [18]. To summarize, exposures have been documented in mining and milling of asbestos ore, and in the production of asbestos textiles, cement building products, friction materials and gaskets. Exposure levels in various tasks in Australian industry have also been described and indicate levels of exposure many times greater than environmental levels [19].

The large gender imbalance in the incidence of mesothelioma probably reflects the historically low numbers of women working in most of the asbestos exposed industries, except perhaps in the textile industry. However, asbestos is also found in the community, arising from sources such as friction linings and building products such as cement sheeting in “fibro” houses. This results in an increased risk of exposure in people who are not in the traditional ‘at-risk’ jobs. In Australia, after World War II until the 1960s, 25% of new houses were clad in asbestos cement [18]. In recent years there has been a shift in asbestos exposure associated with phasing out the production and use of asbestos-containing products. Exposure since the mid-1980s has been limited primarily to the asbestos removal industry with a ban on all asbestos use in any commercial production since 2003.

The Australian Mesothelioma Registry (AMR)

AMR aims to assess exposure to asbestos from both environmental and occupational sources to identify emerging ‘at risk’ occupations and environmental exposures. The registry collects data on registered cases from the population-based cancer registries in each Australian state and territory. Because reporting of cancer cases is mandatory in all Australian jurisdictions, the

Download English Version:

<https://daneshyari.com/en/article/1092249>

Download Persian Version:

<https://daneshyari.com/article/1092249>

[Daneshyari.com](https://daneshyari.com)