SPECIAL ARTICLE

Consensus Report of the 2015 Weinman International Conference on Mesothelioma

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Drs. Carbone, Kanodia, Chao, Miller, Wali, and Malik were meeting organizers and chairs.

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ABSTRACT

On November 9 and 10, 2015, the International Conference on Mesothelioma in Populations Exposed to Naturally Occurring Asbestiform Fibers was held at the University of Hawaii Cancer Center in Honolulu, Hawaii. The meeting was cosponsored by the International Association for the Study of Lung Cancer, and the agenda was designed with significant input from staff at the U.S. National Cancer Institute and National Institute of Environmental Health Sciences. A multidisciplinary group of participants presented updates reflecting a range of disciplinary perspectives, including mineralogy, geology, epidemiology, toxicology, biochemistry, molecular biology, genetics, public health, and clinical oncology. The group identified knowledge gaps that are barriers to preventing and treating malignant mesothelioma (MM) and the required next steps to address barriers. This manuscript reports the group's efforts and focus on strategies to limit risk to the population and reduce the incidence of MM. Four main topics were explored: genetic risk, environmental exposure, biomarkers, and clinical interventions. Genetics plays a critical role in MM when the disease occurs in carriers of germline BRCA1 associated protein 1 mutations. Moreover, it appears likely that, in addition to BRCA1 associated protein 1, other yet unknown genetic variants may also influence the individual risk for development of MM, especially after exposure to asbestos and related mineral fibers. MM is an almost entirely preventable malignancy as it is most often caused by exposure to commercial asbestos or mineral fibers with asbestos-like health effects, such as erionite. In the past in North America and in Europe, the most prominent source of exposure was related to occupation. Present regulations have reduced occupational exposure in these countries; however, some people continue to be exposed to previously installed asbestos in older construction and other settings. Moreover, an increasing number of people are being exposed in rural areas that contain noncommercial asbestos, erionite, and other mineral fibers in soil or rock (termed *naturally occurring asbestos* [NOA]) and are being developed. Public health authorities, scientists, residents, and other affected groups must work together in the areas where exposure to asbestos, including NOA, has been documented in the environment to mitigate or reduce this exposure. Although a blood biomarker validated to be effective for use in screening and identifying MM at an early stage in asbestos/NOA-exposed populations is not currently available, novel biomarkers presented at the meeting, such as high mobility group box 1 and fibulin-3, are promising. There was general agreement that current treatment for MM, which is based on surgery and standard chemotherapy, has a modest effect on the overall survival (OS), which remains dismal. Additionally, although much needed novel therapeutic approaches for MM are being developed and explored in clinical trials, there is a critical need to invest in prevention research, in which there is a great opportunity to reduce the incidence and mortality from MM.

Keywords: Mesothelioma; BAP1; Asbestos; Erionite; Biomarkers; Genetics; Therapy

Introduction

The domestic and global burden of malignant mesothelioma (MM) remains substantial, with approximately 3200 cases per year in the United States[1] and 34,000 estimated deaths worldwide in 2013, respectively.[2] Despite encouraging advances in clarifying the underlying etiologic mechanisms, developing biomarkers for disease detection, and conducting novel clinical trials, the outlook for most patients in whom MM is diagnosed remains dismal.[3,4] Thus, presently the best strategy to reduce the terrible toll of MM is to prevent the disease from ever occurring (primary prevention).

The six types of minerals forming fibers that have been used commercially and fall under the umbrella term of *asbestos* include the serpentine mineral chrysotile and the fibrous amphiboles cummingtonite-grunerite (amosite asbestos), actinolite, anthophyllite, riebeckite (crocidolite asbestos), and tremolite.[5] Additionally,