

Chapter

1. Asbestos Exposure Assessment, Risk Identification, and Substitutes

Section

C. Epidemiology of ARDs

No./Title

24. Vermiculite, respiratory disease, and asbestos exposure in Libby, Montana: update of a cohort mortality study

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Introduction

Asian context

Vermiculite is contaminated with tremolite and has been used in loose-fill attic (space below the roof) insulation in millions of homes in Northern America. Asian countries should identify the extent to which vermiculite was used and for other possible sources of contaminated minerals.

Critical appraisal

Dose-related increases in asbestosis and lung cancer mortality was observed among workers who mined, milled, and processed the Libby vermiculite. Authors raise caution for the relevant homeowners or construction workers.

Unique keywords

Vermiculite, tremolite, contamination, Libby Montana, historical cohort mortality study

Abstract



Background: Vermiculite from the mine near Libby, Montana, is contaminated with tremolite asbestos and other amphibole fibers (winchite and richterite). Asbestos-contaminated Libby vermiculite was used in loose-fill attic (space below the roof) insulation that remains in millions of homes in the United States, Canada, and other countries.

Objective: This report describes asbestos-related occupational respiratory disease mortality among workers who mined, milled, and processed the Libby vermiculite.

Methods: This historical cohort mortality study uses life table analysis methods to compare the age-adjusted mortality experience through 2001 of 1,672 Libby workers to that of white men in the U.S. population.

Results: Libby workers were significantly more likely to die from asbestosis [standardized mortality ratio (SMR) = 165.8; 95% confidence interval (CI), 103.9-251.1], lung cancer (SMR = 1.7; 95% CI, 1.4-2.1), cancer of the pleura (SMR = 23.3; 95% CI, 6.3-59.5), and mesothelioma. Mortality from asbestosis and lung cancer increased with increasing duration and cumulative exposure to airborne tremolite asbestos and other amphibole fibers.

Conclusions: The observed dose-related increases in asbestosis and lung cancer mortality highlight the need for better understanding and control of exposures that may occur when homeowners or construction workers (including plumbers, cable installers, electricians, telephone repair personnel, and insulators) disturb loose-fill attic insulation made with asbestos-contaminated vermiculite from Libby, Montana.

Annotation

Fact 1

- In a historical cohort mortality study of workers who mined, milled, and processed the Libby vermiculite, there was excess mortality of asbestosis (SMR = 165.8; 103.9-251.1), cancer of the pleura (SMR = 23.3; 6.3-59.5) and mesothelioma (SMR = 15.1; 1.8-54.4).

Fact 2

- Libby workers also experienced significant excess mortality from cancer of the trachea, bronchus, and lung (SMR = 1.7; 1.4-2.1) and nonmalignant respiratory disease (SMR = 2.4; 2.0-2.9).

Fact 3

- Among Libby workers, those working < 1 year experienced a significant excess in lung cancer (SMR = 1.6; 95% CI, 1.1-2.1), with the SMR rising to 2.5 (95% CI, 1.4-4.3) among those working for ≥ 10 years.

Fact 4

- Among Libby workers, those working < 15 months were 38.2 (95% CI, 7.7-125.1) times more likely than expected to die from asbestosis; among those employed ≥ 10 years, the SMR of asbestosis was 628.6 (95% CI, 301.1-1,185.1).

Fact 5

- SMRs for asbestosis increased with increasing cumulative exposure. The SMR rose from 37.3 (7.5-122.3) among workers with < 50 fibers/cc-years exposure, to 749.1 (373.0-1,367.8) among those with ≥ 250 fibers/cc-years cumulative exposure.

References