

Chapter

1. Asbestos Exposure Assessment, Risk Identification, and Substitutes

Section

C. Epidemiology of ARDs

No./Title

26. Mortality among shipyard Coast Guard workers: a retrospective cohort study

Author/Contributor

Krstev S, Stewart P, Rusiecki J, Blair A

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Introduction

Asian context

Shipbuilding and shipwrecking constitute a major source of asbestos exposure in Asia, but epidemiological studies have been few.

Critical appraisal

Mortality risk of civilian workers in a US Coast Guard shipyard revealed a small but significant excess mortality from all causes, lung cancer and mesothelioma, most of which is probably related to asbestos exposure.

Unique keywords

Lung cancer, mesothelioma, shipyard

Abstract

Background: The mortality experience of 4,702 (4,413 men and 289 women) civilian workers in a US Coast Guard shipyard was evaluated.

Methods: All workers employed at the shipyard between 1 January 1950 and 31 December 1964 were included in the study and were followed through 31 December 2001 for vital status. Detailed shipyard and lifetime work histories found in the shipyard personnel records and job descriptions were evaluated. Workers were classified as likely exposed to any potential hazardous substances. In addition, 20 job groups were created on likely similar exposures. Standardized mortality ratios (SMRs) were calculated based on the general population of the state and adjusted for age, calendar period, sex and race.

Results: The follow-up was successful for 93.3% of the workers. Among all men employed in the shipyard, there was an excess of mortality from all causes of death (SMR 1.08; 95% CI 1.04 to 1.12), respiratory cancers (SMR 1.29; 95% CI 1.15 to 1.43), lung cancer (SMR 1.26; 95% CI 1.12 to 1.41), mesothelioma (SMR 5.07; 95% CI 1.85 to 11.03) and emphysema (SMR 1.44; 95% CI 1.01 to 1.99) and a decrease for cardiovascular diseases (OR 0.95; 95% CI 0.90 to 1.00), vascular lesions of the central nervous system (SMR 0.80; 95% CI 0.67 to 0.96), cirrhosis of the liver (SMR 0.38; 95% CI 0.25 to 0.57) and external causes of death (SMR 0.55; 95% CI 0.44 to 0.68). A similar pattern was observed for the men classified as exposed. No increasing trend of mortality was found with duration of employment in the shipyard, with the exception of mesothelioma (SMRs of 4.23 and 6.27 for < 10 years and ≥ 10 years, respectively). In occupations with at least three cases and with an SMR of ≥ 1.3, the authors observed a significantly elevated mortality for lung cancer among machinists (SMR 1.60; 95% CI 1.08 to 2.29) and shipfitters, welders and cutters (SMR 1.34; 95% CI 1.07 to 1.65) and for oral and nasopharyngeal cancers among wood workers (SMR 6.20; 95% CI 2.27 to 13.50).

Conclusions: Employment in this Coast Guard shipyard revealed a small but significant excess mortality from all causes, lung cancer and mesothelioma, most of which is probably related to asbestos exposure.

Annotation

Fact 1

- In a retrospective cohort mortality study of US Coast Guard shipyard workers, significantly increased mortality among male workers was observed for all causes of death (standardized mortality ratio (SMR) 1.08; 1.04-1.12), all respiratory cancers (SMR 1.29; 95% CI, 1.15-1.43), mesothelioma (SMR 5.07; 1.85-11.03), lung cancers (SMR 1.26; 1.12-1.41) and emphysema (SMR 1.44; 1.01-1.99).

Fact 2

- Risk of death from mesothelioma increased with duration of employment in shipyard being SMR 4.25 (0.85-12.42) for shorter duration of employment (< 10 years) and reaching statistical significance of SMR 6.27 (1.26-18.32) for longer employment duration (≥ 10 years).

Fact 3

- Among male workers exposed to any potential hazardous substances, significant excesses occurred for cancers of the respiratory system (SMR 1.28; 1.14-1.43), mesothelioma (SMR 5.39; 1.97-11.74) and lung cancer (SMR 1.26; 1.11-1.41).

Fact 4

- Increased risks for mesothelioma were observed for many occupational groups, e.g., carpenters, electricians, plumbers, indicating that asbestos exposure was probably widespread in the shipyards.

Fact 5

- Excess mortality from lung and laryngeal cancers was found in the shipyards due to widespread exposure to asbestos.

References