An Updated Study of Mortality among North American Synthetic Rubber Industry Workers – Methods and Preliminary Results

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Abstract

Background: Concerns about the possible toxic effects of workplace exposures in the synthetic rubber industry have centered on 1,3-butadiene (BD) and styrene. We have previously assembled and analyzed epidemiologic data on 17,924 men and updated their mortality experience. Our results indicated that the men had an excess of leukemia that was likely to have been due to exposure to BD or BD plus other chemicals. We also completed a study of mortality among 4,863 women in the synthetic rubber industry employed at the same plants as the men. These women did not have any excess of deaths from leukemia or other forms of lymphohematopoietic cancer. However, we observed an excess of lung among some subgroups of women. Evaluation of the relation between cumulative exposure to BD and styrene and lung cancer did not find any association that was likely to be causal among women or men, and styrene did not appear to be associated with lung cancer.
Aim: This paper presents the methods and preliminary results of an updated study of synthetic rubber industry workers that adds 11 years of follow-up for men and seven years of follow-up for women, and re-evaluates the 1943-2009 mortality experience of the study group in relation to monomer exposure and other characteristics of employment in the industry.
Methods: Men employed for at least one year and women employed for at least 1 day at any of eight North American styrene–butadiene rubber plants were followed up from 1943 to 2009. Identifying and work history information were obtained from personnel records. Estimated quantitative exposure to BD and styrene, developed for our previous study of men, were used in this study. External analyses used the standardized mortality ratios (SMRs) to compare the cohort's cause-specific mortality rates to the rates of the male and female general population of the states or the province where the plants are located. Internal analyses used Cox regression to examine specific cancer mortality rates in relation to quantitative estimates of BD and styrene exposure. Preliminary results of the internal analyses will be presented.