Exposure to benzene and risk of breast cancer among shoe factory workers in Italy

Adele Seniori Costantini1, Giuseppe Gorini1, Dario Consonni2, Lucia Miligi1, Lucia Giovannetti1, and Margaret Quinn3

1Occupational and Environmental Epidemiology Unit, ISPO Cancer Prevention and Research Institute, Florence, Italy; 2Department of Occupational Health, Istituti Clinici di Perfezionamento, Milano, Italy; 3Department of Work Environment, University of Massachusetts, Lowell, MA, USA

ABSTRACT

Aims and background. Evidence of the association between leukemia and benzene exposure has been provided by several epidemiological studies. An increased risk of breast cancer among women exposed to benzene has also been suggested. The aim of this study was to analyze breast cancer risk in a cohort of 1,002 women exposed to benzene in a shoe factory in Florence, Italy, where an excess of leukemia in men was reported.

Methods. The cohort of women at work on January 1st, 1950, was followed from 1950 to 2003 for mortality and from 1985 to 2000 for incidence of breast cancer. For a subcohort of 797 women, cumulative exposure to benzene was available.

Results. Standardized mortality ratios were obtained for the 797 women for whom information on cumulative exposure was available. For those with <30 years of latency the standardized mortality ratio was 58.5 (95% CI, 18.9-181.2, based on 3 deaths) and 151.1 (95% CI, 78.6-290.3, based on 9 deaths) for ≥30 years of latency. In the >40 ppm-year and ≥30 year latency period category, the standardized mortality ratio was 166.0 (95% CI, 62.3-442.2, based on 4 deaths). The standardized incidence ratio for women with a latency period <30 years was 140.9 (95% CI, 75.8-261.9, based on 10 cases) and 108.2 (95% CI, 64.1-182.7) for a latency period ≥30 years. For cumulative exposure >40 ppm-years and a latency period <30 years, the standardized incidence ratio was 211.9 (95% CI, 29.9-1504.1, based on 1 case).

Conclusions. The study moderately supports the hypothesis that benzene represents a risk factor for breast cancer.

Key words: benzene, breast cancer, shoe worker.

Acknowledgments: Valentina Cacciarini, Alessandra Benvenuti, and Andrea Martini performed the follow-up of the cohort.

Correspondence to: Adele Seniori Costantini, UO Epidemiologia analitica e ambientale e occupazionale, ISPO, via di San Salvi 12, 50135 Florence, Italy
Tel +39-055-6268349;
fax +39-055-679954;
e-mail a.seniori@ispo.toscana.it

Received August 27, 2008; accepted November 29, 2008.