

MORTALITY IN DRY-CLEANING WORKERS: AN UPDATE

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Background: Perchloroethylene (PCE) is a known animal carcinogen and probably human carcinogen to which over one-half million U.S. workers are exposed. This is the third report on a cohort of 1,708 dry-cleaning workers, identified from union records and now followed through 1996. All were exposed to PCE for at least one year before 1960; 625 worked only in shops where PCE was the cleaning solvent.

Results: This cohort is experiencing a significant increase in cancer deaths (271 deaths, standardized mortality ratio [SMR] 1.25, 95% confidence interval [CI] 1.14-1.41). Deaths from cancer of the tongue (5 deaths, SMR 5.00, CI 1.62-11.68), bladder (10 deaths, SMR 2.22, CI 1.06-4.08), esophagus (14 deaths, SMR 2.47, CI 1.35-4.14), intestine (32 deaths, SMR 1.56, CI 1.02-2.29), lung (65 deaths, SMR 1.36, CI 1.05-1.73), and cervix (12 deaths, SMR 1.95, CI 1.00-3.40) were significantly in excess, as were deaths from pneumonia (43 deaths, SMR 1.53, CI 1.07-2.06) and diseases of the stomach and duodenum (11 deaths, SMR 2.33, CI 1.16-4.17). For all cancer deaths, SMRs were higher among those with 20 years or more since first exposure and among those who worked more than five years. Deaths due to accidents (8 deaths, SMR 0.25, CI 0.11-0.50) were significantly decreased. Among those exposed only to PCE (n=625) there were statistically significant excesses for cancer of the tongue (3 deaths, SMR 9.03, CI 1.86-26.39), ischemic heart disease (93 deaths, SMR 1.27, CI 1.02-1.55), and urinary calculi (2 deaths, SMR 16.97, CI 2.05-61.25), and a deficit of deaths due to diseases of the circulatory system (24 deaths, SMR 0.66, CI 0.42-0.97). A significant excess of esophageal cancer was seen among those who worked only with PCE, for more than five years, and whose first exposure was at least 20 years before death: 5 deaths, SMR 6.36, CI 2.05-15.78)

Discussion: The first study of this cohort included deaths through 1982 and reported a statistically significant excess of bladder cancer and excess for several gastrointestinal cancers and cervical cancer. The previous update included deaths through 1990 and reported statistically significant excesses of bladder, esophageal, and intestinal cancer, and the esophageal cancer excess (with four deaths) in those who worked only with PCE, for more than five years, and whose first exposure was at least 20 years before death. Those cancers remain in significant excess; deaths from cancers of the tongue, lung, and cervix are now significantly elevated as well. Other cohort studies of dry cleaners have also found excesses of esophageal, intestinal, bladder, and cervical cancer, and for non-cancer respiratory disease and ischemic heart disease.

Conclusion: The excess cancer mortality in this cohort has persisted for three decades. Although some of the cancer excess could be attributed to lifestyle choices or socioeconomic factors, a pattern of higher SMRs among those who worked longer, or with more time since first exposure, suggests an occupational association. Such an association could be with another solvent among those who did not work exclusively with PCE, but not among those who did. Cancer incidence, cross-sectional, and prospective studies would help to examine nonfatal diseases and to control for confounding exposures.

Key Words: solvents, occupational exposure, tetrachloroethylene, cohort studies

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