

PERC Not a Risk Factor for Cancer

A newly published epidemiology study finds that the incidence of several important cancer types among drycleaning workers in the Nordic countries does not appear to be related to exposure to the predominant drycleaning solvent, perchloroethylene (PERC). The nested case control study was specifically designed to overcome the limitations of earlier studies and represents an important addition to the scientific literature on the widely used solvent.

The results of prior studies of drycleaners, primarily from the United States, have been inconsistent but have indicated that PERC exposure might increase the risk of esophageal and cervical cancer and of non-Hodgkin's lymphoma (NHL). These earlier studies suffered from limitations, however, that included exposure to cleaning solvents other than PERC and the inability to take into account smoking or other lifestyle factors known to affect the incidence of these cancers.

The Nordic study, conducted by five prominent European epidemiologists, was undertaken as a series of case-control studies nested in the cohorts (i.e., groups) of laundry and dry cleaning workers identified from the 1970 census data in Denmark, Norway, Sweden, and Finland. In addition to the three cancer types identified above, the researchers also looked at the incidence of liver and kidney cancer based mainly on the results of laboratory animal tests with PERC, and bladder and pancreas cancer identified in recent updates of US cohorts of drycleaning workers. An eighth cancer type, gastric cardia, was included because of its proximity to the esophagus and reports of an overall increase in Western countries.

The Nordic cohorts comprised a total of over 46,000 persons. Each person was followed up for death, emigration, and cancer incidence based on linkage with the national population, death, and cancer registers using unique personal identifiers. Employment, health, and lifestyle information was collected from national pension data bases and interviews with next of kin.

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The researchers found that the risks of esophageal, liver, kidney, pancreatic, and gastric cardia cancer and NHL were not significantly increased among the Nordic drycleaners. While cervical cancer was increased among assistants in drycleaning shops, it was not elevated in women directly involved in drycleaning, and the increase was determined by the researchers not to be related to PERC exposure. The authors did observe a small increase in bladder cancer that was not, however, associated with the length of employment (i.e., degree of exposure to PERC). This finding is consistent with those of previous studies that failed to find an excess of bladder cancer among workers exposed only to PERC.

The Nordic study provides several advantages over the previous drycleaning studies. First, the study covers a period when PERC was the dominant solvent, estimated to be used by 70 to 90 percent of the industry in the four countries. Second, the study included all persons working in drycleaning in those countries in 1970. Third, the nested case-control design of the study allowed the researchers to compare the cancer risks of drycleaners with those of laundry workers, a similar

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PERC Study **(continued from page 1)**

group apart from the use of solvents. In particular, cigarette smoking was equally frequent among exposed and unexposed subjects. Fourth, population, death and cancer registers and unique personal identifiers allowed the researchers to completely ascertain the incidence of cancer.

“The result,” according to the Halogenated Solvent Industry Alliance’s (HSIA) Science Director Dr. Paul Dugard, “is a study with a significantly improved ability to detect the potential for increased cancer incidence resulting from exposure to PERC.”

Perhaps the most significant finding in this latest study is the absence of an increased incidence of esophageal cancer in the Nordic drycleaning workers. Prior studies of smaller groups of US workers have reported an increase in esophageal cancer, which is known to be associated with smoking, alcohol consumption, hot drinks, and poor nutrition. The Nordic researchers suggest that the difference between their findings and those of the US studies might be due to “chance, confounding, or differences in exposure level.” They note that, while the US studies compared cancer incidence among drycleaners with that of the national population, the data available from the Nordic countries allowed them to control for the possible effects of lifestyle and socioeconomic factors by comparing incidence between two similar groups -- drycleaning and laundry workers.

The authors’ suggestion about differences between PERC exposures among Nordic and US workers is largely based on anecdotal exposure and equipment data. A comparison of per-capita consumption of PERC by the respective drycleaning industries, however, suggests only marginal differences between the US and Nordic countries. This information is supported by available data indicating that exposure to PERC from spotting formulations and elsewhere in the plant likely contributed significantly to exposures in the time frame of interest.

The study results will appear in an upcoming issue of the journal *Environmental Health Perspectives*, published by the National Institute of Environmental Health Sciences. It currently is available online in the “In-Press” section of the journal’s web site, www.ehponline.org. (Look for Lynge et al, *Cancer in Persons Working in Dry Cleaning in the Nordic Countries* posted on October 13, 2005.)

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Halogenated Solvents Industry Alliance, Inc.