

Polychlorinated Biphenyls, Chlordanes, and the Etiology of Non-Hodgkin's Lymphoma

To the Editor

During the last few decades, non-Hodgkin's lymphoma (NHL) has been one of the most rapidly increasing types of cancer in the Western world. During the period 1958–1992, the mean age-adjusted incidence increased yearly by 3.6% in men and 2.9% in women in Sweden.¹

In previous investigations, NHL has been associated with exposure to phenoxy herbicides, chlorophenols, or organic solvents.^{2,3} Phenoxyacetic acids and chlorophenols may be contaminated by dioxins and dibenzofurans, and increased concentrations of these substances may be found in exposed subjects.⁴ Immunotoxic effects have been reported for dioxins,^{5,6} chlorophenols,^{7,8} and also organic solvents.^{9,10} Recently, Faustini *et al.*¹¹ reported immunologic changes among farmers exposed to phenoxy herbicides. It also is well known that immune deficiency increases the risk for NHL.^{12,13}

Recently, we presented results from a case-control study on NHL and adipose tissue concentrations of some organochlorine compounds. "We chose as controls surgical patients without cancer. We found negligible effects for dioxins, dibenzofurans, dichlorodiphenyldichloroethylene, or hexachlorobenzene. Several of the higher and more persistent polychlorinated biphenyls (PCBs) were elevated in cases, however. The mean concentration of total PCBs was 1,614 ng per gm lipid (range = 637–4,705 ng per gm lipid) in the 27 cases, vs 1,213 ng per gm lipid (range = 366–2,282 ng per gm lipid) in the 17 controls. The sum of chlordanes was 180 ng per gm lipid (range = 48.3–678 ng per gm lipid) in the cases, vs 92.8 ng per gm lipid (range = 37.0–164 ng per gm lipid) in the controls.

Now we have analyzed the sum of PCBs and chlordanes in a multivariate logistic regression analysis controlling for age and sex. The odds ratio (OR) for the sum of PCBs higher than the median concentration of 1,300 ng per gm lipid (taken as exposed) was 1.8 [95% confidence interval (CI) = 0.4–7.4]. For the sum of chlordanes higher than the median concentration of 119 ng per gm lipid, we estimated an OR of 3.3 (95% CI = 0.7–16.2). We found little difference by clinical stage of NHL and between men (N = 17 cases) and women (N = 10 cases). Cases and controls had similar age distributions, and we found no important relation with body mass index. No case or control reported occupational exposure to PCBs or chlordanes, so these findings relate to general population exposure levels. Since both PCBs and chlordanes may cause immunologic impairment in exposed subjects,^{16,17} our findings, although based on small numbers, support the hypothesis that agents that are immunotoxic increase the risk for NHL.

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Epidemiology and the Internet

To the Editor:

We read with interest Part II of the recent editorial on "Epidemiology and the Internet," related to the use of the World Wide Web (WWW) for conducting prospective cohort studies. Our interest arises not only from a shared curiosity regarding the application of new information technologies to