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An Evaluation Of Glyphosate Use And The Risks Of Non-Hodgkin Lymphoma Major Histological Sub-Types In The North American Pooled Project (Napp)

Manisha Pahwa - Occupational Cancer Research Centre; John J. Spinelli - British Columbia Cancer Agency Research Centre; Laura Beane Freeman - U.S. National Cancer Institute; Paul A. Demers - Occupational Cancer Research Centre; Aaron Blair - U.S. National Cancer Institute; Punam Pahwa - University Of Saskatoon; James A. Dosman - University Of Saskatoon; John R. Mclaughlin - Samuel Lunenfeld Research Institute; Shelia Hoar Zahm - U.S. National Cancer Institute; Kenneth P. Cantor - U.S. National Cancer Institute; Dennis D. Weisenburger - City Of Hope; Shelley A. Harris - Cancer Care Ontario;

Objectives: Glyphosate is a commonly used herbicide worldwide. Some epidemiological studies have linked exposure with the development of non-Hodgkin lymphoma (NHL), a group of cancers with distinct risk factors and etiologies. This study aimed to evaluate possible associations between glyphosate exposure and NHL risk. Methods: The NAPP, composed of pooled case-control studies from the US and Canada, includes NHL cases (N=1690) and controls (N=5131) who provided information on pesticide use. Cases (follicular lymphoma [FL], diffuse large B-cell lymphoma [DLBCL], small lymphocytic lymphoma [SLL], other) from cancer registries and hospitals were frequency-matched to population-based controls. Logistic regression was used to estimate odds ratios (OR) and 95% confidence intervals (CI) by ever/never, duration, frequency, and lifetime days of glyphosate use. Models were adjusted for age, sex, location, proxy respondent, family history of lymphohematopoietic cancer, and personal protective equipment. Results: Cases who ever used glyphosate had elevated NHL risk overall (OR=1.51, 95% CI: 1.18, 1.95). The highest risks were found for "other" sub-types (OR=1.91, 95% CI: 1.20, 3.04). Subjects who used glyphosate for >5 years had increased SLL risk (OR=2.58, 95% CI: 1.03, 6.48). Compared to non-handlers, those who handled glyphosate for >2 days/year had significantly elevated odds of NHL overall (OR=2.66, 95% CI: 1.61, 4.40) and FL (OR=2.36, 95% CI: 1.06, 5.29), DLBCL (OR=3.11, 95% CI: 1.61, 6.00), and other (OR=2.99, 95% CI: 1.10, 8.09) sub-types. There were suggestive increases in NHL risk overall with more lifetime days of use but this trend was not statistically significant (p=0.065). Conclusion: This study provides some evidence that glyphosate use may be associated with increased NHL risk. Effects may differ by histological sub-type. The large sample size of the NAPP enabled a detailed investigation despite some inconsistent results across different exposure metrics.



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