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Farm Exposure to Individual Pesticides and Glioma in Men.

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An excess incidence of brain cancer in farmers has been noted in several studies. The Brain Cancer Collaborative Study Group conducted the Upper Midwest Health Study to evaluate associations between rural exposures and brain cancers among adult (18-80) male and female rural residents in Iowa, Michigan, Minnesota and Wisconsin, where brain cancer incidence is significantly elevated. Histologically confirmed intracranial glioma cases (458 men) diagnosed January 1, 1995, through January 31, 1997, were identified from hospitals, medical practices, and cancer registries. Controls (648 men) were stratified samples of licensed drivers (ages 18-64) and Health Care Finance Administration enrollees (ages 65-80) residing in rural counties of each state. In-person interviews with participants or proxies collected farm, occupational, and other exposure information. Participants who lived on a farm where a pesticide was used were classified as exposed to that pesticide; those who reported personally handling a pesticide on the farm were classified as users. A NIOSH reference database, with over 800 trade names whose active ingredients have been identified was used to convert pesticide trade name responses to generics. The frequency of farm use of generics was used to identify pesticides to which ≥ 100 participants (men and women) reported exposure. Multivariate logistic regressions controlled for farm residence and for age since controls were older. Those exposed to or using farm pesticides were compared with the 128 controls and 125 cases who had no farm, home and garden, or occupational pesticide exposure. Exposure to any farm pesticide was associated with lower glioma risk: adjusted odds ratio [OR] 0.54, 95% confidence interval [CI], 0.36-0.83. There was no association between farm residents' exposure to alachlor, cyanazine, diazinon, dicamba, glyphosate, metolachlor, pendimethalin, or trifluralin, and glioma risk. There were negative statistically significant associations between glioma risk and farm residents' exposure to 2,4-D, atrazine, DDT, and malathion. Use of any farm pesticide also was associated with lower glioma risk: OR 0.51, CI, 0.33-0.80. Personal use of pesticides on the farm was significantly lower among cases than controls for 2,4-D, alachlor, atrazine, cyanazine DDT, dicamba, malathion, and metolachlor. Results for analyses excluding proxy respondents (47% of cases) did not differ significantly. Evidence has been shown for pesticides crossing the blood-brain barrier and for pesticide central nervous system neurotoxicity. However the evidence for pesticide carcinogenicity in the brain is not strong. In our study, no positive association of farm pesticide exposure or use and glioma risk was found. Other farm exposures, which will be analyzed in future papers, may explain the excess brain cancer risk seen in previous studies of rural residents.

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