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Farm Exposure to Pesticides and Glioma in Women

A.M. Ruder (1), M.A. Waters (1), M.A. Butler (1), T. Carreon (1), G.M. Calvert (1), K.E. Davis-King (1), P.A. Schulte (1), W.T. Sanderson (1), E.M. Ward (1), L.B. Connally (1), E.F. Heineman (2), J.S. Mandel (3), R.F. Morton (4), D.J. Reding (5), K.D. Rosenman (6), G. Talaska (7)

(1) National Institute for Occupational Safety and Health, (2) National Cancer Institute, (3) University of Minnesota, (4) Mercy Medical Center, (5) Marshfield Foundation, (6) Michigan State University, (7) University of Cincinnati

An excess incidence of brain cancer in male farmers has been noted in several studies, but few studies have focused on women. This study evaluated the association between pesticide exposure and brain cancer among adult (18-80) female rural residents in Iowa, Michigan, Minnesota and Wisconsin, states where brain cancer incidence is significantly elevated. Since it has been suggested that hormonal factors play a role in the development of brain tumors, the effect of pesticides reported as endocrine disruptors was also evaluated. Histologically confirmed intracranial glioma cases (n=341) were identified from hospitals and medical practices. Controls (n=528) were stratified samples of rural residents who were licensed drivers (ages 18-64) and Health Care Finance Administration enrollees (ages 65-80). In-person interviews collected farm, occupational and other exposure information. Participants exposed to pesticides resided on farms where pesticides were used; participants who used pesticides personally handled them. A National Institute for Occupational Safety and Health database was used to convert pesticide trade name responses to generics. Pesticides to which 100 participants (either gender) reported exposure were identified. Logistic regression models adjusted for farm residence and age, using as reference group 156 cases and 201 controls who had no farm, home and garden, or occupational pesticide exposure. No association with glioma was observed for exposure to or use of arsenical pesticides, botanical pesticides, carbamates, chloroacetanilides, dinitroanilines, dinitrophenols, inorganic pesticides, organochlorines, organothiophosphates, phenoxy pesticides, triazines, or urea-based pesticides. A negative statistically significant association was observed for farm residents' exposure to organophosphates and glioma, but not for personal use. No association was observed between farm residence, exposure to or use of 2,4-D, atrazine, cyanazine, diazinon, dicamba, glyphosate, malathion, metolachlor, pendimethalin, or trifluralin, and glioma risk. Pesticides with reported estrogenic activities, such as DDT and alachlor, did not affect the risk of glioma. Women were less likely than men to have applied pesticides, but more likely to have laundered pesticide-contaminated clothes. Results were not affected by exclusion of proxy responses (43% cases, 3% controls). This is the first population-based case-control study of glioma among rural residents to evaluate the effect of pesticide exposure and work practices in women. No evidence for association of pesticide use and glioma risk was found. Other farm exposures, yet to be analyzed, may explain the excess brain cancer among rural residents.

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