Abstracts

Poster: 0003

Use of Agricultural Pesticides and Prostate Cancer Risk in the Agricultural Health Study Cohort And Future Plans For Molecular Studies

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The role of specific agricultural chemicals in relation to prostate cancer risk and other cancers has not been firmly established due to lack of precise exposure data in previous studies. We comprehensively examined the relationship between 50 common agricultural pesticides and prostate cancer incidence at two points in time (i.e., 2003 and 2005) in a prospective cohort study of 55,332 male applicators from Iowa and North Carolina (the Agricultural Health Study) without prior history of prostate cancer. In both periods of time, a significant excess risk of prostate cancer was observed. Farmers and commercial pesticide applicators had an SIR for prostate cancer of 1.23 (1.18-1.33). Significant exposure-response relationships and/or interaction odds ratio between specific pesticides (butylate, chlorpyrifos, coumaphos, fonofos, phorate, and pyrethrin) among those with a family history of prostate cancer but not among those without a family history of prostate cancer risk were observed, confirming earlier observations. These pesticide-family history interactions suggest gene-environment interactions, but alternative explanations related to clustering of occupational exposures are also possible. A nested case-control study of selected metabolic and DNA repair gene polymorphisms and several biomarkers of genetic and epigenetic damage is planned to clarify the mechanisms that may be responsible for the observed association in our cohort analysis. Specifically, we will assess whether markers of oxidative stress, inflammatory response, genetic and epigenetic damage is observed more frequently in highly exposed subjects compared to those with low exposure over a working lifetime. Histological and molecular tumor tissue characteristics among high and low exposed cases will also be compared.

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