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Exposure to pesticides and risk of Hodgkin lymphoma in an international consortium of agricultural cohorts (AGRICOH)

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Background: There is strong evidence that the use of pesticides increases the risk of hematological malignancies, but associations with Hodgkin lymphoma remain poorly understood. Here, we report associations between Hodgkin lymphoma incidence and the use of 22 pesticide active ingredients and 13 chemical groups (organophosphate, carbamate, organochlorine, and pyrethroid insecticides; (phenyl) urea, chloroacetanilide, dinitroaniline, phenoxy, thiocarbamate, triazine, and triazinone herbicides; and dithiocarbamate and pthalamide fungicides) in three large agricultural cohorts from France, Norway and the USA participating in an international consortium of agricultural cohorts (AGRICOH).

Methods: Use of specific active ingredients was self-reported (USA) or derived from crop-exposure matrices applied to self-reported histories of crop production activity (France and Norway). Multivariable Cox regression models were used to estimate cohort-specific hazard ratios (HRs) and 95% confidence intervals (CIs), which were then combined using random effects meta-analysis for each active ingredient and chemical group, by ever or duration of use (< or ≥16 years).

Results: Among a total of 316,270 farmers (75% male), 91 incident Hodgkin lymphoma cases were diagnosed during follow-up from 1993 to 2011 (3,574,815 person-years). Risks appeared elevated in association with use of dicamba (meta-HR=1.63, 95% CI: 0.83-3.22), DDT (meta-HR=1.79, 95% CI: 0.73-4.37), deltamethrin (meta-HR=1.86, 95% CI: 0.76-4.52) and esfenvalerate (meta-HR=1.86, 95% CI: 0.78-4.43), although precision of risk estimates was generally low.

Conclusions: We did not observe any statistically significant associations between use of pesticide chemical groups or specific active ingredients and HL risk among agricultural workers. Future studies analyses should aim to study examine larger number of cases, possibly stratified by histological subtype, EBV-status and age, and strive to further refine exposure assessment methods.

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