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Maternal prenatal use of alcohol, tobacco, and illicit drugs and associations with childhood cancer subtypes

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Abstract

Background: The association between childhood cancer risk and maternal prenatal substance use/abuse remains uncertain due to modest sample sizes and heterogeneous study designs.

Methods: We surveyed parents of children with cancer regarding maternal gestational use of tobacco, alcohol, and illicit drugs, using a Likert-type scale, and demographic, perinatal, and clinical variables. Multivariable log-Poisson regression assessed differences in frequency of prenatal substance use across fifteen childhood cancer subtypes, adjusting for birthweight, gestational age, and demographic factors.

Results: Respondents from 3145 unique families completed the survey (92% biological mothers). A minority reported gestational use of tobacco products (14%), illicit drugs including marijuana or cocaine (4%), or more than a moderate amount of alcohol (2%). Prenatal illicit drug use was associated with increased prevalence of intracranial embryonal tumors (prevalence ratio [PR]=1.94, CI=1.05-3.58), including medulloblastoma (PR=1.82) and supratentorial primitive neuroectodermal tumors (PNETs; PR=2.66), and was also associated with retinoblastoma (PR=3.11; CI=1.20-8.08). Moderate to heavy alcohol consumption was strongly associated with elevated prevalence of non-Hodgkin lymphoma (PR=5.94; CI=1.84-19.21). Prenatal smoking was not associated with elevated prevalence of any childhood cancer subtype.

Conclusions: We identify novel associations between illicit drug use during pregnancy and increased prevalence of non-glioma central nervous system tumors, including medulloblastoma, supratentorial PNETs, and retinoblastoma. Gestational exposure to alcohol was positively associated with non-Hodgkin lymphoma.

Impact: While alcohol and tobacco use during pregnancy has declined, gestational cannabis use has risen. Investigating its impact on neurodevelopment and brain tumorigenesis is vital, with important implications for childhood cancer research and public health education.

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