SEASON OF BIRTH AND RISK FOR ADULT GLIOMAS: THE UPPER MIDWEST HEALTH STUDY

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Abstract: The etiology of adult gliomas is largely unknown. Exposure to ionization radiation is the only well-established environmental risk factor, but this factor can only explain a small percentage of cases. Seasonal variation of births has been suggested as a surrogate risk factor potentially related to infectious agents, pesticides, vitamin D deficiency, antihistamines and other perinatal exposures. Results to date have been inconsistent and a plausible scientific explanation for the occurrence of adult gliomas decades after a seasonal exposure remains elusive. To test the hypothesis that risk varies by season of birth, we analyzed data from the population-based Upper Midwest Health Study (CDC/NIOSH/DSHEFS) of 798 adult primary intracranial glioma cases (ICD-O codes 938-948) and 1175 controls. Risk, adjusted for gender, was observed to peak at calendar birth day 169 (mid-June) [sinusoidal regression term (SRT) p=0.039], however the odds ratio (OR) comparing the 3-month peak to nadir window (PNW) was small and the 95% lower confidence limit (CI) overlapped unity (OR=1.2, CI=0.95-1.6). Seasonal risk differed for individuals born on a farm [n=765, SRT p=0.16, PNW OR=1.4, CI=0.95-2.2, peak day = 276 (early-October)] compared with those not born on a farm [n=1208, SRT p= 0.0044, PNW OR=1.8, CI=1.3-2.6, peak day = 152 (early-June)]. We conclude that seasonality of birth overall is not an etiologically important risk factor for adult gliomas in this population, although further study is warranted of a possible interaction effect involving birth “on vs. off” a farm.

Key words: Seasonality, glioma, brain tumors, sinusoidal regression

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