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Epidemiology

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An infectious aetiology for childhood brain tumours? Evidence from space-time clustering and seasonality analyses

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To investigate whether infections or other environmental exposures may be involved in the aetiology of childhood central nervous system tumours, we have analysed for space-time clustering and seasonality using population-based data from the North West of England for the period 1954 to 1998. Knox tests for space-time interactions between cases were applied with fixed thresholds of close in space, <5 km, and close in time, <1 year apart. Addresses at birth and diagnosis were used. Tests were repeated replacing geographical distance with distance to the Nth nearest neighbour. N was chosen such that the mean distance was 5 km. Data were also examined by a second order procedure based on K-functions. Tests for heterogeneity and Edwards' test for sinusoidal variation were applied to examine changes of incidence with month of birth or diagnosis. There was strong evidence of space-time clustering, particularly involving cases of astrocytoma and ependymoma. Analyses of seasonal variation showed excesses of cases born in the late Autumn or Winter. Results are consistent with a role for infections in a proportion of cases from these diagnostic groups. Further studies are needed to identify putative infectious agents.

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Keywords: brain tumours; children; aetiology; infection; seasonal variation; space-time clustering

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