ABSTRACT

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Population-based analysis of CNS tumor diagnoses, treatment, and survival in congenital and infant age groups.

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BACKGROUND: Congenital (< 3 months) and infant (3 to 11 months) brain tumors are biologically different from tumors in older children, but their epidemiology has not been studied comprehensively. Insight into epidemiological differences could help tailor treatment recommendations by age and increase overall survival (OS).

METHODS: Population-based data from SEER were obtained for 14,493 0-19-year-olds diagnosed with CNS tumors 1990-2015. Congenital and infant age groups were compared to patients aged 1-19 years based on incidence, treatment, and survival using Chi-square and Kaplan-Meier analyses. Hazard ratios were estimated from univariate and multivariable Cox proportional hazards survival analyses.

RESULTS: Between the < 3-month, 3-5-month, 6-11 month, and 1-19-year age groups, tumor type distribution differed significantly ($p < 0.001$). 5-year OS for all tumors was 36.7% (< 3 months), 56.0% (< 3-5 months), 63.8% (6-11 months), and 74.7% (1-19 years) ($p < 0.001$). Comparing between age groups by tumor type, OS was worst for < 3-month-olds with low-grade glioma, medulloblastoma, and other embryonal tumors; OS was worst for 3-5-month-olds with ependymoma, < 1-year-olds collectively with atypical teratoid-rhabdoid tumor, and 1-19-year-olds with high-grade glioma (HGG) (log rank $p < 0.02$ for all tumor types). Under 3-month-olds were least likely to receive any treatment for each tumor type and least likely to undergo surgery for all except HGG. Under 1-year-olds were far less likely than 1-19-year-olds to undergo both radiation and chemotherapy for embryonal tumors.

CONCLUSIONS: Subtype distribution, treatment patterns, and prognosis of congenital/infant CNS tumors differ from those in older children. Better, more standardized treatment guidelines may improve poorer outcomes seen in these youngest patients.

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