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Pediatric intramedullary spinal cord tumors: A national cancer database analysis of demographics, patterns of care, and survival

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Abstract

Objective: Query the National Cancer Database (NCDB) to delineate epidemiologic frequency, care patterns, and survival outcomes of pediatric intramedullary spinal cord tumors (IMSCTs).

Methods: IMSCTs included ependymoma, astrocytoma, and hemangioblastoma. We examined data from the NCDB spanning 2004-2018, focusing on IMSCT in children aged 0-21 years. Our analysis included logistic and Poisson regression, Kaplan-Meier survival estimates, and Cox proportional hazards models.

Results: This study included 1066 patients aged 0-21 years. 59.4 % of patients were male, while 83.1 % were white. The most common tumor histology was ependymoma (57.5 %), followed by astrocytoma (36.1 %) and hemangioblastoma (6.4 %). 24.9 % of patients received radiotherapy, with radiotherapy utilization being highest among patients aged 6-10 years. Chemotherapy utilization was highest in patients aged 0-5 years. 87.2 % of patients underwent surgical resection, with higher rates in patients aged 16-21 years. Overall survival did not differ significantly between resected and non-resected patients ($p = 0.315$). Patients in rural areas had worse OS than those in metro areas (HR = 4.42, $p = 0.048$). Patients with astrocytoma had worse OS compared to other histologies (HR = 2.21, $p = 0.003$). Astrocytoma patients were over twice as likely to have prolonged LOS compared to ependymoma patients (OR = 2.204, $p < 0.001$).

Conclusions: In summary, our analysis utilizing the NCDB database provides a comprehensive overview of demographics, care patterns, and outcomes for the largest cohort of pediatric IMSCTs to date. These insights underscore the complexity of managing IMSCTs and emphasize the need for tailored approaches to improve patient outcomes.

Keywords: Chemotherapy; Disparity; Intramedullary spinal cord tumors; NCDB; Pediatric; Radiation therapy; Surgery.