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Intraventricular Glioma in Pediatric Patients: A Systematic Review of Demographics, Clinical Characteristics, and Outcomes

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Abstract

Objective: We conducted a systematic review on pediatric intraventricular gliomas to survey the patient population, tumor characteristics, management, and outcomes.

Methods: PubMed, Scopus, Web-of-Science, and Cochrane were searched using PRISMA guidelines to include studies reporting pediatric patients with intraventricular gliomas.

Results: A total of 30 studies with 317 patients were included. Most patients were male (54%), diagnosed at a mean age of 8 years (0.2-19), and frequently exhibited headache (24%), nausea and vomiting (21%), and seizures (15%). Tumors were predominantly located in the fourth (48%) or lateral ventricle (44%). Most tumors were WHO grade 1 (68%). Glioblastomas were rarely reported (2%). Management included surgical resection (97%) radiotherapy (27%), chemotherapy (8%), and cerebrospinal fluid diversion for hydrocephalus (38%). Gross total resection was achieved in 59% of cases. Cranial nerve deficit was the most common post-surgical complication (28%) but most were reported in articles published prior to the year 2000 (89%). Newer cases published during or after the year 2000 exhibited significantly higher rates of gross total resection (78% vs. 39%, $p<0.01$), lower rates of recurrence (26% vs. 47%, $p<0.01$), longer average overall survival time (42 vs 21 months, $p=0.02$), and a higher proportion of patients alive (83% vs. 70%, $p=0.03$) than older cases.

Conclusions: Pediatric intraventricular gliomas correlate with parenchymal pediatric gliomas in terms of age at diagnosis and general outcomes. The mainstay of management is complete surgical excision and more recent studies report longer overall survival rates and less cranial nerve complications.

Keywords: Intraventricular glioma; Neuro-oncology; Pediatric glioma; Radiotherapy.