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Clinical Characteristics and Delayed Diagnosis of Pediatric Patients Presenting to the Emergency Department With a Newly Diagnosed Central Nervous System Tumor: A Single Institutional Experience

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Abstract

Background: Due to the varied symptomatology and inconsistent features on neurologic exam, central nervous system (CNS) tumors are difficult to diagnosis in a timely manner.

Objective: To determine the clinical, neurological, and neuroimaging features of newly diagnosed CNS tumors presenting to the emergency department (ED).

Methods: We evaluated a retrospective cohort of 121 consecutive patients presenting to a tertiary care pediatric ED over 7 consecutive years with newly diagnosed CNS tumors. Clinical symptomatology, neurologic findings reported by emergency room and neurology physicians, neuroimaging features, and time to diagnosis were analyzed.

Results: A total of 116 (48 female, median age 8.0 years (interquartile range, 4.4-12.6), 52% Hispanic) presented to the ED (64% self-referred) diagnosed with a brain tumor (54% posterior fossa, 24% embryonal, 24% low-grade glioma, 16% high-grade glioma) resulting in hospital admission in 92% of cases. Five were diagnosed with extradural spinal, clivus, or orbital apex tumors. Symptomatology or duration did not differ when stratified by demographics, location, or histologic subtype. Moderate degree of concordance was observed among neurologic examinations performed by ED physicians and neurologists. Delayed diagnosis (median delay = 3.5 [1-7] months) was seen in 14% of patients, 13 with primary brain tumors (11 hemispheric, 2 brain stem). Six children with delayed diagnosis of low-grade glial tumors had a nonfocal neurologic examination in comparison to 5 patients with abnormal examinations observed with primary spinal or extradural CNS tumors. Four patients with posterior fossa tumors (3 medulloblastoma, 1 ependymoma) had normal/near normal neurologic examination at presentation despite posterior fossa symptomatology related to increased intracranial pressure.

Conclusions: Our series highlights the complexity of symptomatology and neurologic findings in children presenting to the ED with newly diagnosed CNS tumors who may have a normal neurologic examination. Standardization of symptom assessment and focused neurologic examinations may lead to earlier neuroimaging and prevent delayed diagnosis.

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