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abstract

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Anwesha Singh, Ritika Khurana, Purva Kanvinde, Minnie Bodhanwala, Sangeeta Mudaliar

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Mind Over Malignancy: Unravelling neurologic challenges in paediatric oncology

Author: *Anwesha Singh [1], Ritika Khurana, Purva Kanvinde, Minnie Bodhanwala, Sangeeta Mudaliar*

Affiliation: *[1] Bai Jerbai Wadia Hospital for Children, Mumbai, India*

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Introduction: Neurological events (NEs) are common at presentation and during treatment of paediatric cancers. Awareness about common neurological complications, preventive strategies, evaluation and timely intervention help reduce neurological morbidity. Our aim was to study the spectrum of NEs in paediatric oncology and possible factors affecting outcomes.

Methodology: Paediatric cancer patients (0-18 years) diagnosed between January 2019 and December 2024 with Nes were included. Children having CNS tumours and other neurological disorders were excluded. Cancer type, neurological complications, treatment received and outcome data were collected retrospectively.

Results: Out of 1092 patients, 99 NEs (79 in haematological and 20 in solid malignancies) were recorded. Children older than 5 years were at significantly higher risk. High risk cancers had greater incidence of events ($n=63$, $p<0.05$). Twenty-four patients had NEs at diagnosis and seventy-five during chemotherapy with maximum incidence during Induction Phase (n=35). Common causes included chemotherapy-related drug toxicity (n=45), spinal cord compression (n=17), posterior reversible encephalopathy syndrome (n=9), disease-associated (n=9), intra-cranial haemorrhage (ICH) (n=8), infections (n=4), metabolic derangements (n=4) and cerebral venous sinus thrombosis (n=3). Chemotherapy-induced events were significantly higher during induction ($n= 17$, $p<0.05$). Seizures (n=28) and motor weakness (n=28) were the commonest manifestations, followed by peripheral neuropathy (n=25), altered sensorium (n=15), ocular complaints (n=2), and autonomic symptoms (n=1).

Median recovery period was 4 weeks, which was significantly short for systemic causes (3 days) and longest for spinal cord compression (10 weeks). 58 patients had complete recovery, 34 recovered partially, but 7 showed no recovery/death. Etiology of events and phase of chemotherapy correlated significantly with neurological outcomes ($p<0.05$); occurrence of events itself affected overall survival ($p<0.05$). Cause of death was sepsis (n=3), ICH (n=3) and progressive disease (n=1).

Conclusion: Neurological complications in paediatric cancers are multifactorial, leading to significant morbidity and mortality. Early identification of high-risk patients and tailored interventions improve outcomes.