

Posterior Reversible Encephalopathy Syndrome: Occurrence and Clinical Characteristics in Children with Cancer

Katherine Sommers¹, Jodi Skiles,² Brian Leland³, Courtney Rowan³

¹Indiana University School of Medicine; ²Indiana University School of Medicine, Department of Pediatrics, Division of Hematology/Oncology; ³ Indiana University School of Medicine, Department of Pediatrics, Division of Critical Care.

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Background: The diagnosis and outcomes of posterior reversible encephalopathy syndrome (PRES) in children with cancer are not well understood. We aim to determine the incidence of PRES in pediatric oncology patients, describe the associated morbidity and mortality, and to better understand risk factors in this patient population.

Project Methods: We screened 473 children with a hematologic malignancy or post-allogeneic hematopoietic cell transplantation (HCT) between June 2015 and June 2020 for PRES to determine incidence and if age or diagnosis is associated with PRES. To evaluate if comorbidities or chemotherapeutic agents are associated with PRES, we conducted a case-control study. Children with PRES were matched with two controls based on age and diagnosis to identify additional risk factors for PRES development. Incidence was calculated over the 5-year period. Mann Whitney U and Chi-Squared or Fisher Exact Tests were performed using SPSS v26 to compare continuous and categorical variables respectively.

Results: Fourteen (3.0%) patients developed PRES, resulting in an incidence of 5.9/1000 people/year. Median age was not different between those that developed PRES [14 years (IQR: 11, 17.25)] and those that did not [9.6 years (IQR: 3.8, 15.4)], ($p=0.421$). Allogeneic HCT was associated with the development of PRES ($p=0.019$). PRES symptoms were common: hypertension (100%), seizures (79%), nausea/vomiting (50%), altered mental status (50%), and headaches (43%). All received an MRI, and 79% had findings consistent with PRES. The majority (79%) of patients with PRES were admitted to the PICU and 4 (29%) later died. After 2:1 matching, we found that the use of Etoposide ($p=0.008$) was associated with PRES but comorbidities were not.

Conclusion and Implications: While PRES was infrequent in this population, it carries a high morbidity with most requiring PICU admission and a high associated hospital mortality of 29%. The use of etoposide and HCT were associated with PRES.