SUMMARY

INTRODUCTION: PRES is a compilation of specific clinical symptoms with characteristic findings in neuroimaging tests. It occurs in adults and children, including patients treated for cancer or after hematopoietic cell transplantation (HSCT). PRES often complicates the treatment of the underlying disease and delays the therapy.

OBJECTIVES: Multicenter analysis of PRES cases in Polish pediatric oncology and hematology centers (PHO) and hematopoietic cells transplantation units (HSCT). Analysis of prodromal symptoms, laboratory abnormalities, clinical course and treatment of PRES. Assessment of the impact of PRES on ICU hospitalization, chronic complications, OS and EFS.

PATIENTS AND METHODS: Multicenter retrospective analysis of children treated for malignancy or after HSCT in 2014-2022. The study group included patients with PRES (n=120). The control group consisted of patients treated for the same diseases as patients in the study group or after HSCT, in whom PRES did not occur (n=318).

RESULTS: PRES was diagnosed in 120 children aged 1.7-16.5 (median 7.7) years. The time from diagnosis of malignancy to PRES for the entire group was 0.03-93 (median 1.9) months. The most common diagnosis was ALL (76.7%). There was no PRES in AML in PHO patients. Lymphomas accounted for 14.2% of diagnoses and other tumors 5.8%. PRES during “de novo” treatment occurred in 93 children within 0.03-14.5 (median 1.47) months from the diagnosis of malignancy. PRES during treatment of recurrence accounted for 14.2% of the study group. The time from diagnosis of recurrence to PRES was 0.0-10 (median 1.6) months. The number of children after HSCT in the study group was 10. PRES occurred 0.3-24.6 (median 4.7) months after HSCT.

The symptoms of PRES included: consciousness disturbances (84.2%), seizures (80.0%), hypertension (74.2%), fatigue (64.2%), abdominal pain (45.0%), visual disturbances (28.3%), and headaches (26.7%). Ionic disorders were observed in 75.0% of children, most often hyponatremia (49.2%) and hypokalemia (37.5%). Patients with PRES were more likely to be diagnosed with hypertension (74.2% vs. 14.2%, $p<0.001$) and seizures (80.0% vs. 6.6%, $p<0.001$) during treatment. Children with PRES required hospitalization in the ICU more often (50.0% vs. 29.6%, $p<0.001$). The most common chronic complications after PRES were: persistent arterial hypertension, which occurred in 27 children (22.5%) and epilepsy, which occurred in 25 children (20.8%). PHO patients with PRES had a lower long-term remission rate

(76.7% vs. 93.7%, p<0.001) and a higher mortality rate (20.8% vs. 6.6%, p<0.001). HSCT patients also had a lower long-term remission rate (40.0% vs. 83.3%, p=0.012) and a higher mortality rate (60.0% vs. 22.2%, p=0.047).

CONCLUSIONS: PRES is a significant complication of oncological and transplantation treatment in children. Most cases occurred in patients with ALL. Seizures and hypertension were the most common symptoms of PRES, and epilepsy and hypertension were its most common complications. Ionic disturbances preceded PRES in 75% of patients. The occurrence of PRES was an unfavorable survival factor.

Keywords: PRES, children, pediatric oncology, HSCT, predictive factors