



Pattern, Risk Factors and Outcome Predictors of Posterior Reversible Encephalopathy Syndrome in Pediatric Cancer Patients

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Background

Posterior reversible encephalopathy syndrome (PRES) is a clinico-radiological syndrome consisting of reversible cortical neurotoxic dysfunction. Outcome is favorable in most of the cases and symptoms resolving in days. However, a small but significant minority will develop persistent brain imaging changes and epilepsy and some studies have reported associated mortality of 5–19% and severe functional impairments in 44% of patients.

Objective

To describe the risk factors, clinical and radiological patterns of PRES and to assess different predictors related to its outcome in pediatric cancer patients.

Materials & Methods

A retrospective study included pediatric cancer patients who developed PRES during their treatment at the Children's Cancer Hospital Egypt (CCHE-57357) from January 2013 to June 2017. Clinical outcome of PRES was assessed using Modified Rankin scale (mRS) after 2 weeks and 3 months from the episode. Patients with good outcome; who had complete recovery from all PRES symptoms without or with mild neurological deficit (mRS 0–2), or bad outcome for those who had significant neurological deficit (mRS 3–5), and those who died due to PRES (mRS 6).

Clinical Features		Clinical Outcome					
		Good (mRS: 0–2) Total no.40		Poor (mRS: 3–5) Total no.10		<i>p</i> Value	
Seizures	NO	5	2	5%	3	30%	.054
	GTC	33	27	67.5%	6	60%	
	Focal	12	11	27.5%	1	10%	
Altered Mental Status	NO	16	15	37.5%	1	10%	.094
	YES	34	25	62.5%	9	90%	
Headache	NO	36	28	70%	8	80%	.529
	YES	14	12	30%	2	20%	
Visual impairment	NO	42	34	85%	8	80%	.7
	YES	8	6	15%	2	20%	
Motor Power Affection	NO	44	39	97.5%	5	50%	<.001*
	YES	6	1	2.5%	5	50%	
Status Epilepticus	NO	45	39	97.5%	6	60%	.004*
	YES	5	1	2.5%	4	40%	
Fever	NO	31	26	65%	5	50%	.382
	YES	19	14	35%	5	50%	
Sepsis	NO	45	37	92.5%	8	80%	.258
	YES	5	3	7.5%	2	20%	

Results

This study included 50 patients (32 hematologic malignancies, 13 solid tumors and 5 post BMT). Convulsions was the most common presenting clinical finding found in 45 patients, and initial motor affection in 6 patients. Hypertension was reported in 86% at the time of onset. Occipital affection was the most common (92%), and advanced PRES was described in 8 patients. Of the whole patients, 80% had complete clinical resolution and 60% showed complete radiological resolution at 2 weeks' evaluation and 2 patients died out of PRES.

Radiological finding		Clinical outcome					
		Good (mRS: 0–2) Total no.40		Poor (mRS: 3–5) Total no.10		<i>p</i> Value	
Occipital	NO	4	3	7.5%	1	10%	1.00
	YES	46	37	92.5%	9	90%	
Parietal	NO	13	12	30%	1	10%	.197
	YES	37	28	70%	9	90%	
Temporal	NO	39	32	80%	7	70%	.495
	YES	11	8	20%	3	30%	
Frontal	NO	34	30	75%	4	40%	.034
	YES	16	10	25%	6	60%	
Basal Ganglia	NO	46	38	95%	8	80%	.174
	YES	4	2	5%	2	20%	
Cerebellum	NO	44	35	87.5%	9	90%	1.0
	YES	6	5	12.5%	1	10%	
Thalamic	NO	47	40	100%	7	70%	.006
	YES	3	0	0%	3	30%	
Typical/ Atypical PRES	Typical	29	26	65%	3	30%	.045
	Atypical	21	14	35%	7	70%	

Unfavorable outcome was associated with those who had motor dysfunction ($p=0.0001$), and status epilepticus ($p=0.004$). Moreover, frontal lobe and thalamic affection and atypical PRES were also associated with poor outcome.

Conclusions

Most of children with cancer who develop PRES have favorable clinical and radiologic outcomes, but exceptionally persistent brain damage and even death may occur. Unfavorable outcome is associated with many factors including motor dysfunction, status epilepticus, frontal lobe or thalamic affection and atypical PRES.

References

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