

CHALLENGES IN THERAPEUTIC PLASMA EXCHANGE IN PEDIATRIC PATIENTS- EXPERIENCE FROM A TERTIARY CARE CENTRE FROM NORTH INDIA

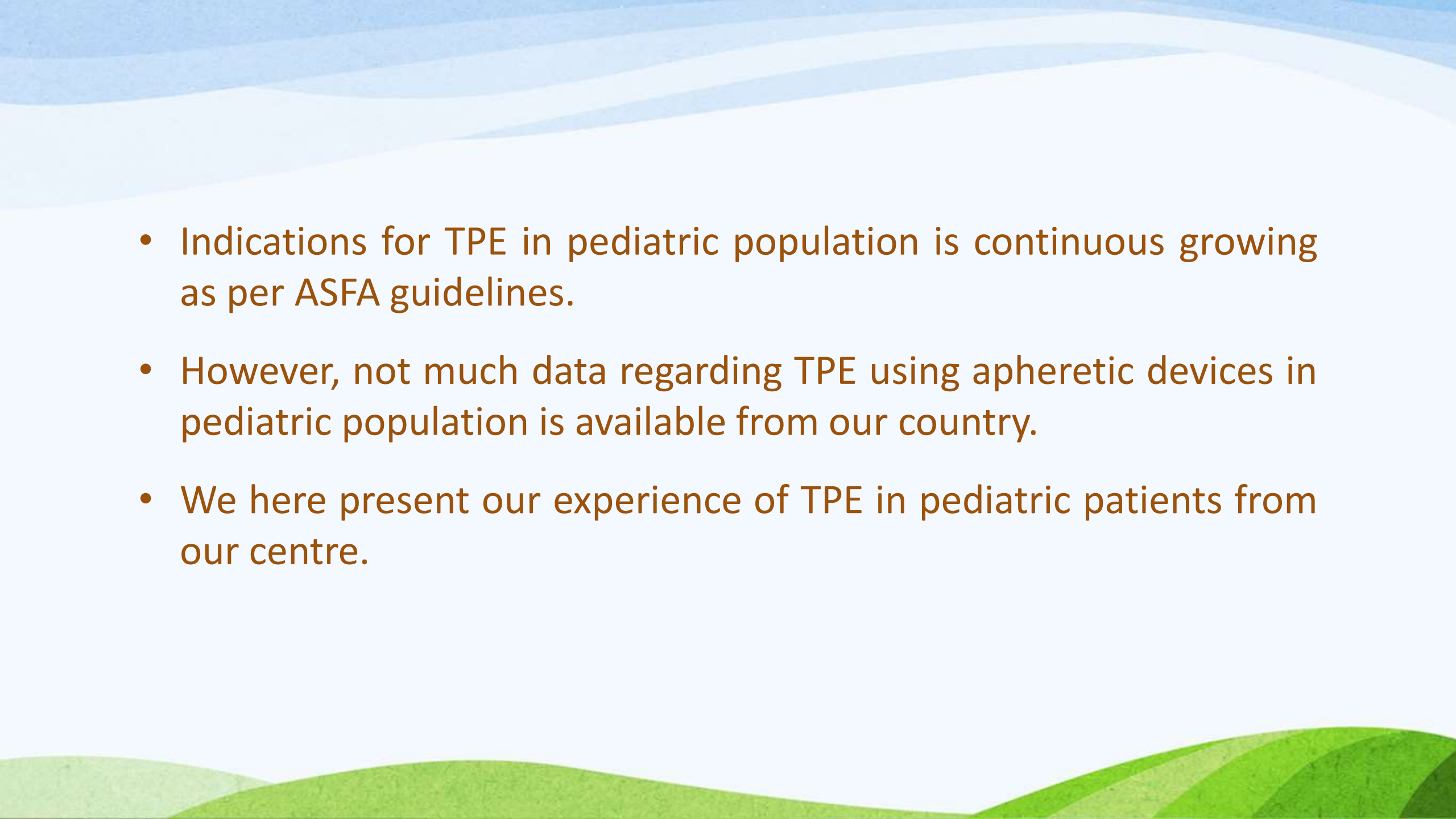


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Background

Therapeutic plasma exchange (TPE) in pediatric age group is technically demanding

- low blood volume
- difficult venous access
- poor co-operation of the patient during the procedure

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- Indications for TPE in pediatric population is continuous growing as per ASFA guidelines.
 - However, not much data regarding TPE using apheretic devices in pediatric population is available from our country.
 - We here present our experience of TPE in pediatric patients from our centre.

AIM

To assess the challenges during TPE in pediatric patients and formulate appropriate strategies.

Material and Methods

- We did retrospective analysis of all TPE procedures performed in pediatric patients over a period of 15 years (2001-2015).
- TPE procedures were done on two different apheretic devices (CS 3000 plus, Fenwal USA and Cobe spectra, Terumo BCT Lakewood, Colorado) daily or on alternate days depending on diagnosis/clinical condition of the patient.
- For all procedures, kit was primed with compatible packed red cells.
- Adverse events during the procedure were noted and analyzed using Pearson chi square test with SPSS ver. 16

Results

A total of 356 TPE (range 1-22/patient with mean of 6.2 procedures) were performed for 55 pediatric patients.

Table-1. Indications for TPE in our patients

Diagnosis	ASFA Category	Number of patients
Atypical Haemolytic Uremic Syndrome	I	44
Neuromyelitis optica	II	04
Rapid proliferative glomeronephritis	I	03
C3 glomerulopathy	-	03
Infective hemophagocytosis	III	01
Total		55

Results contd...

- The average age of patient population was 7.8 yrs (1.2-13 years).
- The Male:Female ratio was 3:1 with an average weight of 25.5 Kgs.
- Adverse events were observed during 20 (5.61%) procedures.

Fig.1-Most commonly observed adverse events

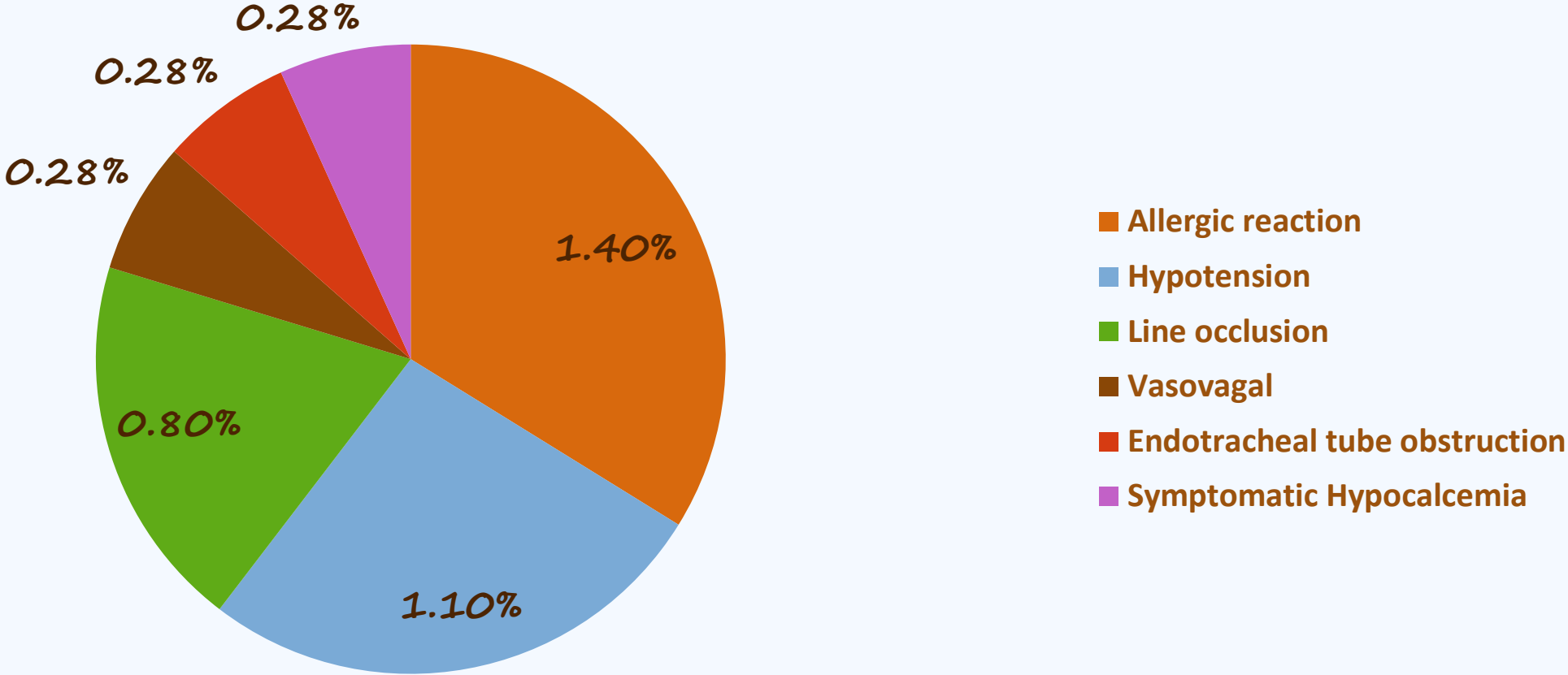


Table-2. Correlation of different parameters with adverse events

Parameter	Distribution	Number of Patients	P-Value
Age	1-5 years	12	.605
	6-10 years	34	
	>10years	9	
Sex	Female	15	0.812
	Male	40	
Weight	1-10Kg	4	0.486
	10-20Kg	9	
	20-30kg	27	
	>30kg	15	
Blood volume	501-1000ml	7	.291
	1000-2000ml	30	
	>2000ml	17	

Parameter	Distribution	Number of Patients	P-Value
Diagnosis	Atypical Haemolytic Uremic Syndrome	44	0.735
	Neuromyelitis optica	04	
	Rapid proliferative glomeronephritis	03	
	C3 glomerulopathy	03	
	Infective hemophagocytosis	01	
No. Of procedures	≤5	32	.021*
	>5	23	

Results contd...

- There was no co-relation observed between different physical parameters of patient with adverse events except for number of procedures done.
- All adverse events were managed as per departmental standard operating procedures (SOPs) and procedures were completed successfully except in one where the procedure was abandoned.
- No mortality was observed during the procedures.

Discussion

- The adverse event rate in pediatric patients undergoing TPE in the literature ranges from 13.8% to 55% which is much higher than in our study.
- Also, our adverse event rate in pediatric patients was comparable to that expected in adults.
- The commonest adverse reaction observed in our study was mild allergic reactions to FFP and is similar to what Sinha et al had observed.
- Hypocalcemia was observed in 1.5% of procedures by Sinha et al which is higher than 0.85% in our study.

Discussion contd...

- This could be due to our stringent patient monitoring protocol and maintaining the inlet: anticoagulant ratio of cell separator at 14:1, during the procedure.
- Pre-procedure ionized Calcium levels were assessed in all patients and Calcium correction was done when ionized Calcium levels were <0.75 mmol.
- Prophylactic Calcium gluconate infusion was also given under close monitoring to prevent hypocalcemia during the procedure.
- Primed the kit with red cells to avoid hypoxemia and hypovolemia.

Efficacy and Safety of Therapeutic Plasma Exchange by Using Apheresis Devices in Pediatric Atypical Hemolytic Uremic Syndrome Patients

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Adverse Events

Adverse events were observed in 13/169 (7.7%) TPE procedures done. The most common adverse event was allergic reaction ($n = 6$) to FFP. Hypotension was observed in 3 procedures, return line blockage was observed in two procedures, followed by hypocalcemia and vasovagal reaction in 1 procedure each. All these adverse events were managed as per our standard operating procedures and TPE procedure could be completed in all except in 1 with symptomatic hypocalcemia.

Conclusion

- TPE is safe therapeutic modality in pediatric patients when performed under expert technical supervision with proper SOPs in place.

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THANK YOU