

Outcomes of therapeutic plasma exchange in pediatric intensive care: insights and implications

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Background

- Therapeutic plasma exchange (TPE) is a crucial intervention in pediatric intensive care, offering vital treatment for a range of conditions.
- This study aims to document the experiences with TPE in a pediatric transplant care setting, acknowledging its advantages while also recognizing the potential risks and complications that may vary according to patient demographics and underlying medical conditions.

Materials and Methods

- This observational study assessed 192 pediatric patients who received 780 TPE sessions at the Pediatric Intensive Care Unit of Başkent University Hospital, Ankara, from December 2018 to December 2023.
- Comprehensive data on patient demographics, clinical features, laboratory results, TPE indications, and documented complications were retrospectively gathered and analyzed using SPSS version 25.

Materials and Methods

- ***The efficacy of TPE was measured using several criteria:*** the restoration of normal platelet counts and hemoglobin levels in hemolytic uremic syndrome; improved renal function and a reduction in donor-specific antibodies in chronic antibody-mediated rejection; and a decrease in transaminase levels and stabilization of liver function in liver transplant recipients experiencing acute rejection.

Results

- The patient group had a mean age of 11.01 ± 6.22 years, comprising 52.1% males and 47.9% females. The majority of TPE sessions (83.3%) utilized fresh frozen plasma, while albumin was employed in 16.7% of cases.
- The interventions predominantly addressed renal (43.06%) and liver (39.8%) conditions. Significant renal indications included atypical hemolytic uremic syndrome, focal segmental glomerulosclerosis, and pre- and post-renal transplantation scenarios (Table 1).

Results

- Liver-related treatments focused on acute liver failure, chronic liver failure, and deranged liver function post-transplantation. The primary complications encountered were mild hypotension (14.9%), severe hypotension (7.4%), fever (10.7%), allergic reactions (12.6%), and vascular access related issues (7.8%).
- Survival was observed in 81% of cases, 15% required additional interventions such as transplantations, and mortality was noted in 4% of the patient group.

Table 1: Demographic, clinical characteristics, and outcomes of renal and liver patients undergoing plasmapheresis

	Renal (n=83)		Liver (n=76)	
Age (Mean ± SD)	11.01 ± 6.22		9.07 ± 6.66	
Gender				
Female	42 (50.6%)		37 (48.7%)	
Male	41 (49.4%)		39 (51.3%)	
Complications				
Mild hypotension	12 (14.5%)		11 (14.5%)	
Severe hypotension	6 (7.2%)		6 (7.9%)	
Fever	9 (10.8%)		8 (10.5%)	
Allergic reactions	10 (12.1%)		10 (13.2%)	
Vascular complications	6 (7.2%)		6 (7.9%)	
Indications	aHUS	31 (37.3%)	ALF	21 (27.6%)
	FSGS	19 (22.8%)	CLF	28 (36.8%)
	Renal Tx	15 (18.0%)	Deranged LF pTx	16 (21.0%)
	Others	18 (21.6%)	Others	11 (14.4%)
Outcomes				
Survival	68 (81.9%)		56 (73.7%)	
Interventions, e.g., Tx	12 (14.5%)		15 (19.7%)	
Mortality	3 (3.6%)		5 (6.6%)	

aHUS (Atypical Hemolytic Uremic Syndrome), FSGS (Focal Segmental Glomerulosclerosis), Tx (Transplantation), ALF (Acute Liver Failure), CLF (Chronic Liver Failure), Deranged LF pTx (Deranged Liver Function post-Transplantation).

Conclusion

- TPE has been demonstrated to be a safe and life-saving procedure that effectively manages a wide array of clinical conditions, offering significant benefits, including the reversal of compromised kidney and liver functions.
- Despite some complications, with effective team coordination and robust management protocols, these issues can be effectively addressed.
- Vigilant monitoring and personalized care during TPE procedures in children are crucial, ensuring the maximization of TPE's therapeutic potential while minimizing risks.