A Single Center Experience Piloting the Tablo Hemodialysis System for Intermittent Hemodialysis in an Acute Care Setting – A Quality Improvement Project

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Background:

- The Tablo hemodialysis system integrates on- demand dialysate production, reverse osmosis water purification and computerized data collection into a single mobile unit.
- The system provides a maximum dialysate flow rate (DFR) of 300ml/min. Kinetic modeling and outpatient clinical experience show that adequacy targets (urea reduction ratios greater than 65%) can be achieved.

Purpose:

This Quality Improvement Project (QI) was undertaken to evaluate the performance of Tablo in patients undergoing intermittent hemodialysis (IHD) in an acute care setting at a single academic medical center.

Methods:

- Between January and February 2019, 25 hospitalized patients with acute (17) or end stage renal failure (8) underwent hemodialysis on the Tablo.
- Treatment parameters including urea reduction ratio (URR), ultrafiltration (UF) accuracy, serum potassium and complications were recorded.

Results:

- Tablo was used for a total of 46 treatments. 32% of patients had weights over 100 kg.
- Vascular access was tunneled catheter (57%) AV fistula (21%) non-tunneled catheter (14%) and AV graft (8%)
- 92% used an Opti 180 and 8% used an Opti 200 dialyzer.
- The average URR was 68% (SD 11) with an average dialysis time of 3.7 hours.
- Pre- dialysis potassium averaged 4.5 meq/L. Potassium obtained the day after dialysis averaged 4.1 meq/L.
- Blood flow rates (BFR) averaged 371 cc/min. (SD 54)
- Average prescribed UF of 1.7 L was achieved.
- 2 treatments were terminated early due to access problems; 2 due to hypotension and 2 due to clotting of the system. An additional 7 treatments required a second cartridge due to system clotting. These 7 treatments were subsequently completed.

Figure 1

TABLO		
# Patients		25
# Treatments		46
URR %	Avg	68
	SD	11
Tx Time (hrs)	Avg	3.78
	SD	0.6
BFR (ml/min)	Avg	371
	SD	54
	Min	200
	Max	400

Summary:

- This QI project demonstrates that the Tablo successfully achieves adequate URR and accurately meets UF targets in the majority of the patients requiring IHD in the acute care setting.
- We did not encounter the frequent water pressure problems with this device that we normally observe in the ICUs.
- The device was welcomed in the crowded quarters of the ICU rooms.
- Close monitoring of the venous pressure will be required to prevent and detect clotting. The addition of periodic saline flushes may decrease the risk of clotting. Low dose heparin may also be required.

Conclusion:

- The Tablo can provide adequate dialysis and UF in the acute hospital setting with DFR 300ml/minute. It has a small footprint (the size of a dormitory refrigerator [Fig. 2]) compared to our present set up (Fig.3), is easier for travel to multiple ICUs and takes up less space in patient rooms.
- Further studies will be required to assess potassium removal in highly catabolic patients.

Figure 2

Figure 3

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