Urea Clearance Results in Patients Dialyzed Thrice Weekly Using a Dialysate Flow of 300 mL/min

Luis Alvarez, MD, PhD1, Leslie Spry, MD2, Jeffrey Mulhern, MD1, Candice Shallal, BSc4, Glenn M. Chertow, MD5, Sarah Prichard, MD6, Michael Aragon, MD7

1 Palo Alto Medical Foundation, 2 Lincoln Nephrology & Hypertension Dialysis Center of Lincoln, Nebraska, 3 Kidney Care, 4 Outset Medical, 5 Stanford University School of Medicine, 6 Advisor Outset Medical, 7 North Texas Kidney Consultants-DFW

Background

Conventional in-center hemodialysis is usually prescribed using a dialysate flow of 500 mL/min. Tablo® is a novel hemodialysis system that enables patient-empowered care at a dialysate flow rate of 300 mL/min. Kinetic modeling data and bench top testing predict that the majority of U.S. patients can achieve adequate urea clearances in under 4-hour treatment times on a thrice weekly hemodialysis treatment schedule with Tablo.

Methods

280 Kt/Vurea assessments were recorded (192 on Tablo and 88 on the non-Tablo devices) on 11 women and 18 men aged 34–84 years (median = 60).

TABLE 1
Demographics for 29 patients in the study population.

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>11</td>
<td>17%</td>
<td>10%</td>
</tr>
</tbody>
</table>

TABLE 2
Clinical Profile for 29 patients in the study population.

<table>
<thead>
<tr>
<th>Dry Weight Range (kg)</th>
<th>Mean Dry Weight (kg)</th>
<th>Fistula</th>
<th>Graft</th>
<th>Catheter</th>
<th>Not Reported</th>
<th>Diabetes</th>
<th>COPD</th>
<th>CHD</th>
<th>PVD</th>
<th>CHF</th>
</tr>
</thead>
<tbody>
<tr>
<td>52–145</td>
<td>89 ± 23</td>
<td>59%</td>
<td>28%</td>
<td>10%</td>
<td>3%</td>
<td>62%</td>
<td>7%</td>
<td>24%</td>
<td>10%</td>
<td>14%</td>
</tr>
</tbody>
</table>

TABLE 3
Treatment time, pre-post weight (a surrogate for fluid removal), and Kt/Vurea results for the 29 patients on the Tablo (dialysate flow 300 mL/min) and the non-Tablo (dialysate flow 500 mL/min) hemodialysis systems.

System | Prescribed Treatment Time, Mean (mins) | Pre-Post Weight, Mean (kg) | % Treatments where Post Weight within 10% of Target Weight | Kt/Vurea (± sd) |
<table>
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</thead>
<tbody>
<tr>
<td>Tablo</td>
<td>240 ± 30</td>
<td>2.5 ± 1.4</td>
<td>100%</td>
<td>1.4 ± 0.2</td>
</tr>
<tr>
<td>Non-Tablo</td>
<td>239 ± 21</td>
<td>2.6 ± 2.2</td>
<td>100%</td>
<td>1.6 ± 0.4</td>
</tr>
</tbody>
</table>

Discussion

In this group of patients who were prescribed similar treatment times on Tablo and non-Tablo dialysis machines, adequacy targets were achieved as predicted by the kinetic modeling previously published. When the patients were divided based on weights above and below 90 kg, the success rate of achieving adequacy targets was similar on Tablo and non-Tablo devices. Fluid removal contributes to the Kt/Vurea. In this study, fluid removal is extrapolated from the pre-post weights, which is not a precise measurement of actual UF, but it is a reasonable surrogate. The differences in fluid removal represented by changes in pre and post dialysis weight is very small and will not materially change the Kt/Vurea result.

Conclusion

Patients across a large weight range achieve adequacy targets at similar frequencies with similar treatment times when comparing treatments on Tablo versus treatments performed with traditional 500 mL/min dialysate flow rates on a thrice weekly hemodialysis treatment schedule. These results affirm previously reported kinetic models. Conclusions about fluid removal cannot be drawn in this study and further studies need to be conducted.

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CONTACT FOR CORRESPONDENCE:
Luis Alvarez, MD, PhD – Alvarez3@sutterhealth.org