INTRODUCTION & AIMS

- Management of mineral and bone disease (MBD) is a cornerstone of dialysis patient care.
- In-center hemodialysis is typically insufficient to balance dietary intake of phosphorus. Thus, oral phosphate binders are prescribed.
- However, due to pill burden and gastrointestinal side effects, adherence to binders is often poor.
- More frequent hemodialysis is an alternative therapeutic approach to MBD, although reductions in serum phosphorus and phosphate binder use may be modest on short daily hemodialysis (versus nocturnal hemodialysis).
- We evaluated MBD parameters in the KIHDNEy cohort of patients on home hemodialysis (HHD) with the NxStage System One (NSO) in 5 Western European countries.

METHODS

- Anonymized patient data were retrospectively collected from participating programs that used the NSO for HHD.
- Each program entered and updated its data in a structured spreadsheet instrument during 2015 and 2016.
- All patients who initiated HHD training with the NSO were prescribed ≥5 sessions/week and remained on therapy for ≥1 year were included in analysis.
- Serum calcium (Ca), serum phosphorus (P), calcium-phosphorus product (Ca×P), and phosphate binder tablets/day were summarized at baseline, 6 months, and 12 months.
- The significance of linear trends in MBD parameters between baseline and 12 months was estimated with mixed linear regression models.

RESULTS

- Among 9 programs, we identified 109 patients (60% of KIHDNEy cohort) who remained on HHD for ≥1 year.
- Treatment frequency per week was 5 sessions in 37% of patients, 6 sessions in 61%, and 7 sessions in 2%.
- Mean (median) treatment time per session was 151 (150) minutes.
- Cumulative treatment time per week was <15 hours in 41% of patients and 15+ hours in 59%.
- Trends in MBD parameters between baseline and 12 months were not significant (P > 0.05).
- With cumulative treatment time of <15 hours/week, P and Ca×P were unchanged between baseline and 12 months, while phosphate binder use increased slightly.
- With cumulative treatment time of ≥15 hours/week, P decreased by 0.10 mmol/L, Ca×P decreased by 0.22 mmol/L², and phosphate binder use decreased by 0.33 tablets/day between baseline and 12 months.
- However, differences both within and between strata were not significant.

Trends in MBD Parameters among 109 Patients on HHD for ≥5 Sessions/Week

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Baseline (mean ± SD)</th>
<th>Month 6 (mean ± SD)</th>
<th>Month 12 (mean ± SD)</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium (mmol/L)</td>
<td>2.29 (0.20)</td>
<td>2.29 (0.20)</td>
<td>2.28 (0.21)</td>
<td>0.61</td>
</tr>
<tr>
<td>Phosphorus (mmol/L)</td>
<td>1.67 (0.49)</td>
<td>1.65 (0.41)</td>
<td>1.61 (0.50)</td>
<td>0.17</td>
</tr>
<tr>
<td>Calcium-Phosphorus Product</td>
<td>3.83 (1.19)</td>
<td>3.78 (1.03)</td>
<td>3.69 (1.25)</td>
<td>0.17</td>
</tr>
<tr>
<td>Phosphate Binders (tablets)</td>
<td>3.3 (3.0)</td>
<td>3.2 (2.9)</td>
<td>3.1 (2.8)</td>
<td>0.30</td>
</tr>
</tbody>
</table>

*Test of trend, by a mixed linear model with random effects for each patient.

Mean Phosphate Binder Pill Burden, Stratified by Cumulative Treatment Duration

<table>
<thead>
<tr>
<th>Treatment Duration (hours/week)</th>
<th>Baseline (mean ± SD)</th>
<th>Month 6 (mean ± SD)</th>
<th>Month 12 (mean ± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15+</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSIONS

- During one year of more frequent HHD with the NxStage System One, mean MBD parameters were stable and within guideline ranges.
- With treatment time ≥15 hours/week, biochemical parameters improved and phosphate binder use decreased.
- With less treatment time, the tandem of unchanged biochemical parameters and slightly increased phosphate binder use is compatible with increased dietary intake, possibly due to loosened dietary restrictions.