Mineral and Bone Disease Parameters on Home Hemodialysis with the NxStage System One

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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

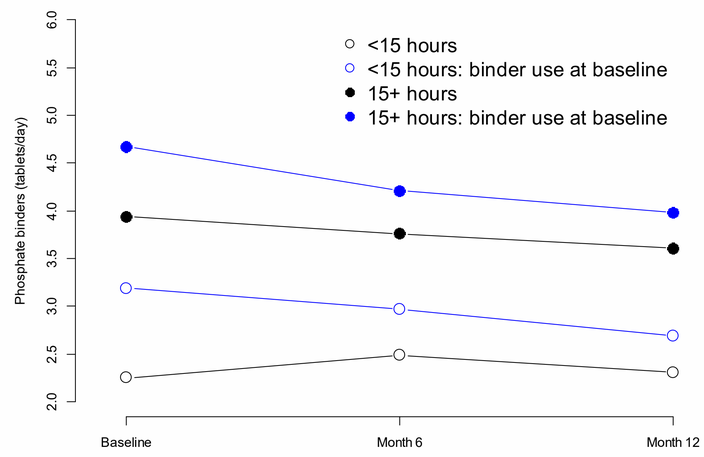
- Among 9 programs, we identified 109 patients (60% of KIHDNEy cohort) who remained on HHD for ≥1 year.
- Treatment frequency per week was 5 sessions in 37% of patients, 6 sessions in 61%, and 7 sessions in 2%.
- Mean (median) treatment time per session was 151 (150) minutes.
- Cumulative treatment time 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 $mmol^2/L^2$, 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**
Mean (standard deviation)

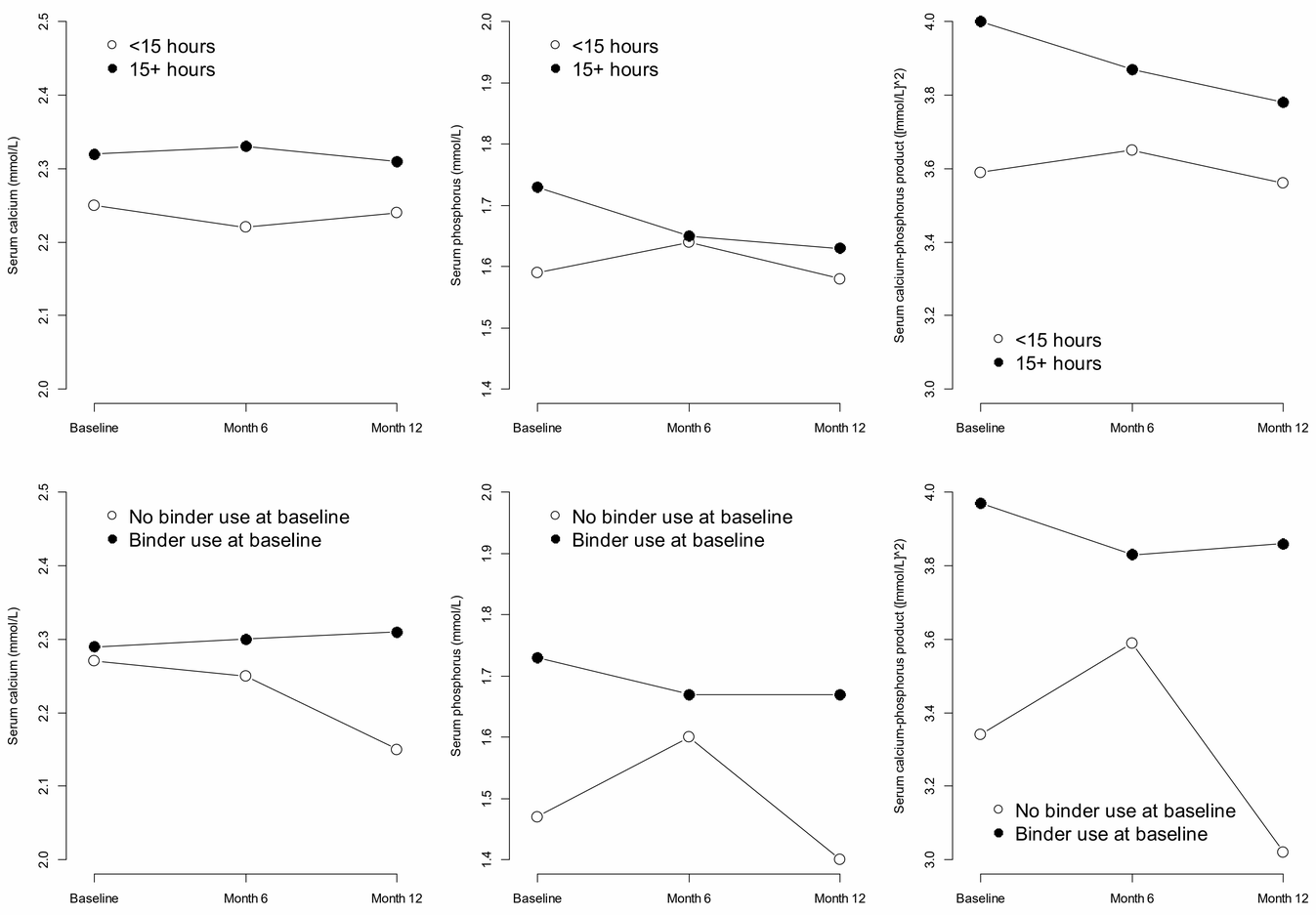
	Baseline	Month 6	Month 12	*P*-value [a]
Calcium (mmol/L)	2.29 (0.20)	2.29 (0.20)	2.28 (0.21)	0.61
Phosphorus (mmol/L)	1.67 (0.49)	1.65 (0.41)	1.61 (0.50)	0.17
Calcium-Phosphorus Product	3.83 (1.19)	3.78 (1.03)	3.69 (1.25)	0.17
Phosphate Binders (tablets/day)	3.3 (3.0)	3.2 (2.9)	3.1 (2.8)	0.30

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

Mean Phosphate Binder Pill Burden,
Stratified by Cumulative Treatment Duration



Trends in Mean MBD parameters, Stratified by Cumulative Treatment Duration (top) and Phosphate Binder Use at Baseline (bottom)
Calcium (left), Phosphorus (middle), and Calcium-Phosphorus Product (right)



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.

KIHDNEy

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