In-Center Nocturnal Hemodialysis Leads to Improved Serum Phosphorus Levels

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INTRODUCTION

Control of serum phosphorous (PO_4) remains a challenge in the hemodialysis patient despite increased choices in oral phosphate binders, as well as intensive dietary counseling. Elevated serum PO_4 levels contribute to secondary hyperparathyroidism, both directly, and by limiting the use of vitamin D analogs, and are associated with an increased mortality from cardiovascular disease. Delayed transfer from intracellular fluid stores to the extracellular fluid compartment limits the contribution of conventional, in-center hemodialysis (ICHD) to phosphate balance.

We postulated that in-center nocturnal hemodialysis (NHD), with its longer treatment times, would result in substantially greater PO_4 removal, resulting in a lower serum PO_4.

METHODOLOGY

- Retrospective, longitudinal cohort (n=418)
- Prevalent ICHD converted to NHD
- 6 months pre- and 9 months post-conversion to NHD
  - compared parameters of bone and mineral metabolism prior to their conversion to NHD (baseline, mean 4, 5 and 6 months before NHD) to these same parameters following the start of NHD (final, mean 7, 8 and 9 months post modality change) as shown in Figure 1 .

RESULTS

Figure 1. Methodology: Conversion from ICHD to NHD

Table 1. Median treatment times

	Median hrs/session	Sessions/ wk	Median total time (hrs/wk)
ICHD	4.0 ± 0.04	3	12.0
NHD	7.6 ± 0.04*	3	22.7*

* p<0.001

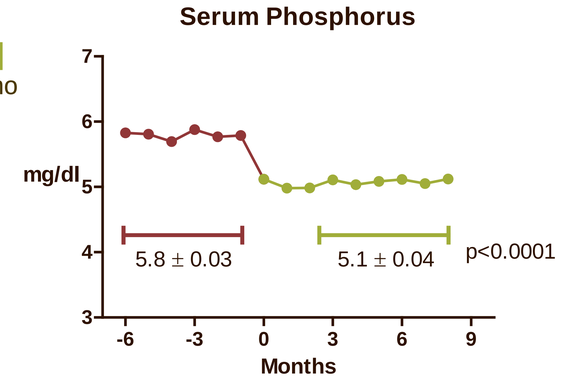

Figure 2. Serum Phosphorus Levels Before and After Conversion to NHD

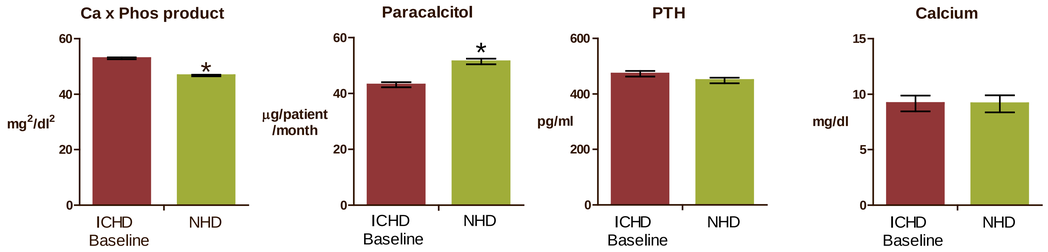

Figure 3. Bone and Mineral Metabolism Markers Before and After Conversion to NHD

CONCLUSIONS

- Median treatment time is significantly higher on NHD compared to ICHD (Table 1).
- Mean serum PO_4 levels decreased 0.67mg/dl during the first month of NHD and, by 9 months, had fallen significantly from ICHD (baseline) to NHD (Figure 2).
- Ca × Phos product decreased and paracalcitol administration increased significantly from ICHD (baseline) to NHD (p<0.001) (Figure 3).
- PTH fell from ICHD (baseline) to NHD (p=0.10), while calcium levels were unchanged.

KEY LEARNINGS

- ✓ When compared to ICHD, NHD resulted in a lower serum PO_4 consistent with enhanced PO_4 removal as a result of the longer dialysis sessions with NHD.
- ✓ The decrease in serum PO_4, Ca × Phos product, and PTH may result in long-term cardiovascular benefits for the NHD patient.
- ✓ In this study we did not control for binder usage. Analysis of binder types and amounts, prior to and after the initiation of NHD, is planned in order to confirm that the nocturnal dialysis treatments were responsible for the observed results.

We thank the patients who participated in this study and DaVita Clinical Research® for support in preparing this poster. DCR is committed to advancing the knowledge and practice of kidney care.

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