



AMERICAN NEPHROLOGY NURSES' ASSOCIATION

**ANNA'S 42<sup>ND</sup> NATIONAL SYMPOSIUM**  
**MARCH 27-30, 2011**  
**HYNES CONVENTION CENTER, BOSTON, MA**

**In-center Nocturnal Hemodialysis leads to Improved Serum Phosphorus (PO<sub>4</sub>) Levels**

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Control of serum phosphorous remains a challenge in the hemodialysis patient despite increased choices in oral phosphate binders, as well as intensive dietary counseling. Elevated serum PO<sub>4</sub> 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 in-center conventional hemodialysis (ICHD) to phosphate balance. We postulated that in-center nocturnal hemodialysis (NHD), with its longer treatment times, would result in substantially greater PO<sub>4</sub> removal, resulting in a lower serum PO<sub>4</sub>. 418 NHD patients were evaluated. We compared parameters of bone and mineral metabolism prior to their conversion to NHD (baseline, mean 4, 5 and 6 months before nocturnal treatment) to these same parameters following the start of NHD (final, mean 7, 8 and 9 months post modality change). The frequency of both ICHD and NHD was 3 sessions per week; the median ICHD session was 4 hrs vs. 7.6 hrs for NHD. Mean serum PO<sub>4</sub> levels decreased 0.67mg/dl during the first month of NHD and, by 9 months, had fallen from a mean (baseline) of  $5.79 \pm 0.03$  to a mean (final) of  $5.09 \pm 0.03$  ( $p < 0.001$ ). Ca  $\times$  Phos decreased from a mean (baseline) of  $52.91 \pm 0.34$  to a mean (final) of  $46.72 \pm 0.31$  ( $p < 0.001$ ). Paracalcitol administration increased from a mean (baseline) of  $43.1 \pm 0.9$   $\mu\text{g}/\text{patient}/\text{month}$  to a mean (final) of  $51.4 \pm 1.0$   $\mu\text{g}/\text{patient}/\text{month}$  ( $p < 0.0001$ ). PTH fell from a mean (baseline) of  $472.3 \pm 10$  pg/ml to  $448.9 \pm 10$  pg/ml ( $p = 0.10$ ), while calcium levels were unchanged. When compared to ICHD, NHD resulted in a lower serum PO<sub>4</sub> consistent with enhanced PO<sub>4</sub> removal as a result of the longer dialysis sessions with NHD. This lower phosphate level may have encouraged more aggressive use of paricalcitol to lower PTH. The decrease in serum PO<sub>4</sub> Ca  $\times$  Phos, and PTH may result in long-term cardiovascular benefits for the NHD patient.

*Abstract selected for presentation at ANNA's 42nd National Symposium, Boston, MA, 2011*