

Serum Phosphorus and Mortality in Chronic Peritoneal Dialysis Patients

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Background

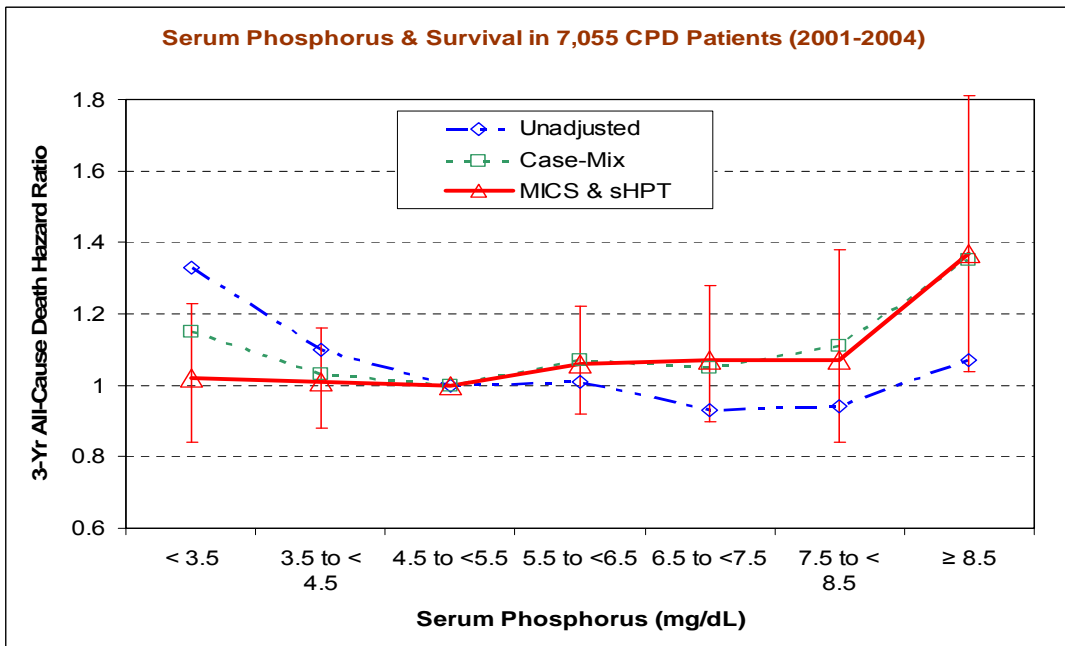
- Both very low and high serum phosphorus (phos) levels are related to survival in maintenance hemodialysis (MHD) patients.
- However, the mortality predictability of phos in chronic peritoneal dialysis (CPD) patients may be different

Hypothesis

- We examined a large and contemporary cohort of 7,037 CPD patients who underwent dialysis treatment for at least 3 months in a DaVita dialysis clinic between July 2001 and June 2004.
- All phos values measured within a 3-month calendar quarters were averaged into one single value.
- Patients were 46.5±10.4 years old and included 48% women, 22% African Americans, 14% Hispanics and 50% diabetics
- Cox models calculated both unadjusted and fully adjusted death hazard ratios (HR) and 95% confidence intervals (CI) for
 - case-mix (age, gender, race/ethnicity, comorbidity, vintage, insurance, marital status, smoking, and dialysis dose)
 - malnutrition-inflammation complex syndrome (serum albumin, creatinine, bicarbonate, TIBC, ferritin, blood hemoglobin, WBC, lymphocyte%) and minerals and bone surrogates (serum calcium and intact PTH).

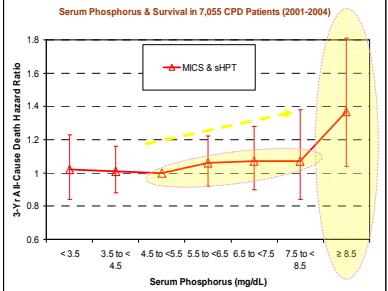
Results

- Phos was categorized into 7 a priori selected groups of <3.5, ≥8.5 and 5 groups of 1 mg/dL increments in-between.
- In unadjusted Cox models, a low phos <3.5 mg/dL was associated with an increased death hazard ratio (HR) of 1.33 (95% confidence interval [CI]: 1.0-1.60, p=0.003, reference: phos 4.5-5.5 mg/dL).
- In multivariate adjusted models for case-mix (gender, age, race, ethnicity, dialysis vintage, residual renal function and Kt/V) and malnutrition-inflammation complex syndrome [MICS] (serum albumin, creatinine, TIBC, WBC, calcium, PTH, lymphocyte percentage and blood hemoglobin), phos ≥8.5 had a death HR of 1.37 (95% CI: 1.04-1.81, p=0.03)



Phosphorus groups (mg/dL)	Group size (%) ^a	All-cause death [%]	Cardiovascular death [% 3 yrs]	Diabetes [% in 3 years]	Serum Phos (m±SD)	Alkaline phosphatase (m±SD)	Albumin (m±SD)	Calcium (m±SD)	Intact PTH (m±SD)
< 3.5	470 (7)	94 [20]	39 [8]	178 [38]	3.0±0.4	113±83	3.53±0.59	9.1±0.7	261±270
3.5 to < 4.5	1564 (22)	360 [23]	136 [9]	655 [42]	4.0±0.3	113±82	3.63±0.50	9.1±0.7	316±303
4.5 to < 5.5	2028 (29)	433 [21]	185 [9]	823 [41]	5.0±0.3	115±87	3.62±0.50	9.2±0.8	377±354
5.5 to < 6.5	1560 (22)	340 [22]	141 [9]	631 [40]	5.9±0.3	114±80	3.63±0.50	9.2±0.9	462±446
6.5 to < 7.5	811 (12)	178 [22]	77 [9]	349 [43]	6.9±0.3	113±84	3.66±0.48	9.1±0.9	561±526
7.5 to < 8.5	354 (5)	71 [20]	24 [7]	152 [43]	7.9±0.3	113±82	3.68±0.50	9.0±1.0	630±572
≥ 8.5	250 (4)	58 [23]	20 [8]	106 [42]	9.4±0.9	113±83	3.63±0.52	8.8±1.0	758±639
All pts	7,037 (100)	1534 [22]	622 [9]	2894 [41]	5.4±1.5	113±84	5.38±1.48	9.1±0.8	417±423

Fully Adjusted Model



Conclusions

- Hence, in CPD patients the association between hypophosphatemia and death is due to confounders such as MICS.
- Whereas severe hyperphosphatemia is an independent death predictor.

Acknowledgements

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