

Baseline Serum Alkaline Phosphatase Is Associated with Increased Death Risk in Diverse Subgroups of Maintenance Hemodialysis Patients

Deborah L. Regidor, MPH^{1,2}; Csaba P. Kovesdy, MD³; Jennie Jing, MS; Charles J. McAllister, MD⁴; Joel D. Kopple, MD¹; and Kamyar Kalantar-Zadeh, MD MPH PhD^{1,2}

(1) Harold Simmons Center for Kidney Disease Research and Epidemiology, Los Angeles Biomedical Research Institute at Harbor-UCLA Medical Center, and David Geffen School of Medicine at UCLA, Torrance and Los Angeles, CA; (2) Dept of Epidemiology, UCLA School of Public Health, Los Angeles, CA; (3) Salem VA Medical Center, Salem, VA; and (4) DaVita, Inc, El Segundo, CA

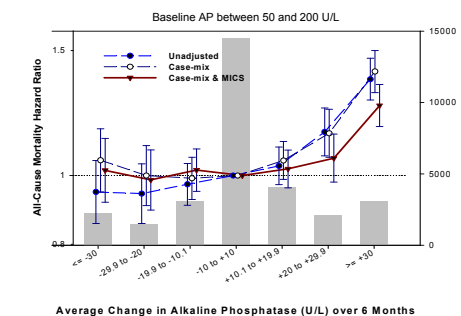
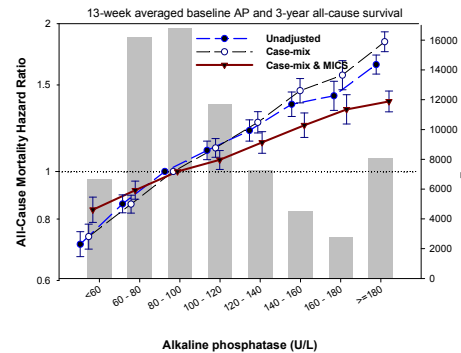
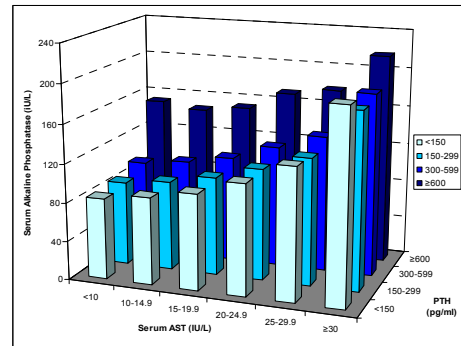
Background

- High serum total alkaline phosphatase (AlkPhos) was recently shown to be associated with increased death risk in maintenance hemodialysis (MHD) patients (pts) (Kalantar-Zadeh et al, *Kidney International* 2006, 70:771-80).
- However, it is not clear whether this association holds in diverse subgroups of MHD pts.
- Nor is it clear whether a decrease or increase in AlkPhos over time is associated with changes in death risk.

Hypothesis

- We examined the association between AlkPhos 120 U/L and all-cause death risk in different demographic, clinical, and laboratory subgroups of 82,049 DaVita MHD pts across the USA.
- In these patients, serum AlkPhos was measured at least one during the first 3 mo (calendar quarter) of the cohort.
- Patients were followed over 3 yrs (7/2001-6/2004).
- Serum AlkPhos was divided into 8 a priori selected groups.
- Changes in AlkPhos over the first 6 months were calculated as well.
- 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) and
 - malnutrition-inflammation complex syndrome (serum albumin, creatinine, bicarbonate, TIBC, ferritin, blood hemoglobin, WBC, lymphocyte%) and minerals and bone surrogates (serum calcium, phosphorus and intact PTH).

Results



	AP ≥ 120 u/L is good	AP ≥ 120 u/L is bad
All patients		
Race/ethnicity		
White		
Black		
Hispanic		
Diabetes mellitus		
Diabetic		
No diabetes		
Gender		
Women		
Men		
Age		
<65 years		
≥65 years		
Vintage		
<6 months		
6 – 24 months		
2 – 5 years		
≥ 5 years		
Serum albumin		
≤3.8 g/dL		
>3.8 g/dL		
Use of paricalcitol		
No paricalcitol		
Paricalcitol		
Serum calcium		
<8.4 mg/dL		
8.4-9.5 mg/dL		
9.5-10.2 mg/dL		
≥10.2 mg/dL		
Serum phosphorus		
<3.5 mg/dL		
3.5-5.5 mg/dL		
≥5.5 mg/dL		
Serum intact PTH		
<150 pg/mL		
150-300 pg/mL		
≥300 pg/mL		

- The unadjusted and fully adjusted death HR (and 95% CI) for AlkPhos 100 IU/L was: **1.47** (1.43-1.51, p<0.0001) and **1.25** (1.21-1.29, p<0.0001).
- In different subgroups of race/ethnicity, diabetes mellitus, gender, age, dialysis vintage, protein intake, and serum albumin, calcium, phosphorus and intact PTH similar death HR were observed.
- An increase in AlkPhos over the first 6 month was associated with increased death in subsequent months.

Conclusions

- In MHD pts, a total serum AlkPhos >120 U/L is a robust risk of mortality in all subgroups.
- Interventions that decrease serum AlkPhos may improve longevity in MHD pts.

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Correspondence:
Kamyar Kalantar-Zadeh, MD, MPH, PhD
Harold Simmons Center for Kidney Disease Research & Epidemiology
Los Angeles Biomedical Research Institute at Harbor-UCLA Medical Center
1124 W. Carson St., C-1 Annex, Torrance, CA 90502-2064
Tel: (310) 222-3891, Fax: (310) 782-1837
Cell: (310) 686-7908
Email Address: kamkai@ucla.edu

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