Serum Alkaline Phosphatase and 3-Year Mortality in 7,596 Chronic Peritoneal Dialysis Patients

Kamyar Kalantar-Zadeh, MD MPH PhD[1,2]; Csaba P. Kovesdy, MD[3]; Uyen Duong, MD, MPH[1,2]; Mark Shapiro, MD[4]; Charles J. McAllister, MD[4]; Joel D. Kopple, MD[1]; Rajnish Mehrotra, MD [1]

(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

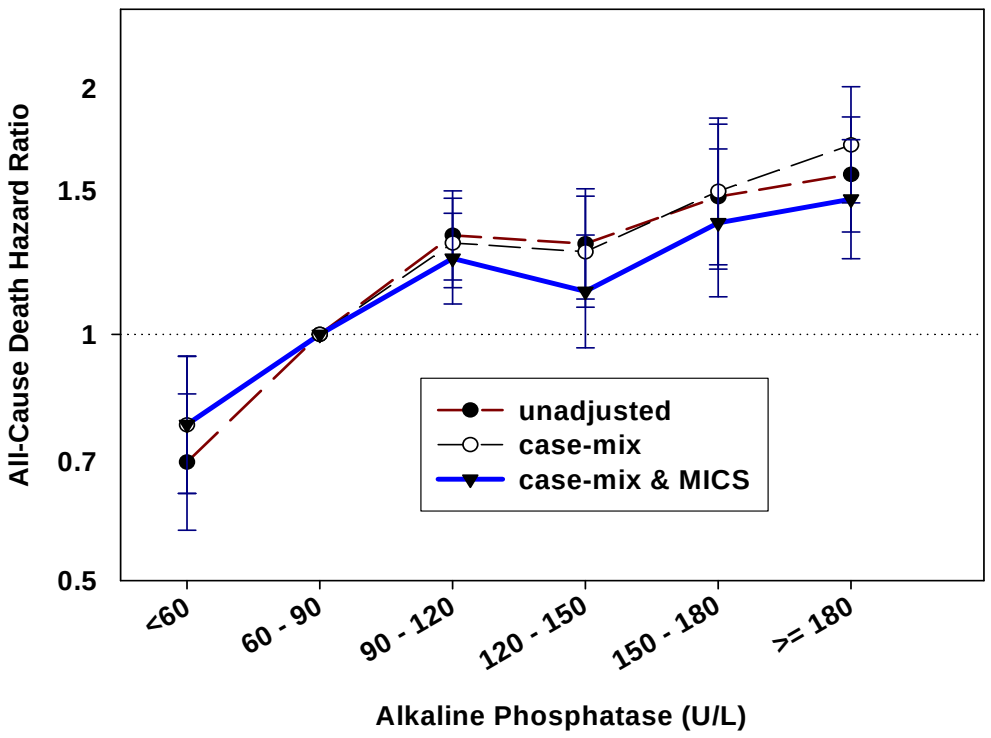
Background

- Serum alkaline phosphatase (AlkPhos), a marker of renal osteodystrophy, was recently found to be a better death predictor than PTH in maintenance hemodialysis patients (Kalantar-Zadeh et al, *Kidney International* 2006, 70:771-80).
- Since adynamic bone disease appears more common in chronic peritoneal dialysis (CPD) patients, we examined the mortality predictability of AlkPhos in them.

Hypothesis

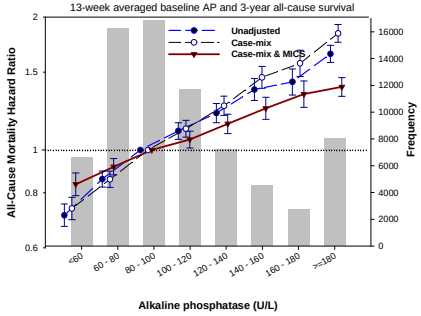
- We examined a large and contemporary cohort of 7,596 CPD patients who underwent dialysis treatment for at least 3 months in a DaVita dialysis clinic between July 2001 and June 2004.
- All serum AlkPhos values measured within a 3-month calendar quarters were averaged into one single value.
- In these 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 6 a priori selected groups by increments of 30 IU/L.
- 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



- Patients were 46.5+/-10.4 years old and included 48% women, 22% African Americans, 14% Hispanics and 50% diabetics.
- Almost incremental death hazard ratios (HR) were noted (AlkPhos 30-60 IU/L as the reference group) including in the multivariate adjusted models for case-mix (gender, age, race, ethnicity, dialysis vintage, residual renal function and Kt/V) and malnutrition-inflammation complex syndrome [MICS] (lymphocyte percentage, hemoglobin, serum albumin, creatinine, TIBC, WBC, calcium, phosphorus and PTH), respectively.

AlkPhos & Survival in HD



Conclusions

- **In CPD patients incrementally higher levels of serum AlkPhos as an indicator of worsening high-turnover bone disease is a strong predictor of mortality, whereas lower AlkPhos is associated with significantly better survival.**
- **Interventions that decrease serum AlkPhos may improve longevity in CPD pts.**

Acknowledgements

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: kamkal@ucla.edu

Funding Source: Supported by research grants from DaVita, Inc, and Philanthropist Mr. Harold C Simmons.
Relevant Conflict of Interest: KKZ has received research grants and honoraria from Abbott (the manufacturer of Zemplar™ and Calcijex™), Amgen (manufacturer of Sensipar™), Genzyme (manufacturer of Sevelamer™ and Hectoral™), and Shire (manufacturer of Fosrenol™).
Poster Session: Saturday, November 3, 2007, 10:00 AM, Halls A/B/C, SA-PO676