

Higher Mid-Arm Muscle Circumference is Independently Associated with Greater Survival in Maintenance Hemodialysis Patients

Nazanin Noori, MD, PhD¹; Kamyar Kalantar-Zadeh, MD, MPH, PhD^{1*}; Csaba P. Kovesdy, MD²; Debbie Benner, MA, RD, CSR³; Joel D. Kopple, MD¹
 (1) Harold Simmons Center for Chronic Disease Research & Epidemiology, and Division of Nephrology & Hypertension, Los Angeles Biomedical Research Institute at Harbor-UCLA Medical Center, Torrance, CA; (2) Salem VAMC, Salem, VA; and (3) DaVita, Lakewood, CO

INTRODUCTION

The body mass index (BMI) is negatively associated with mortality in maintenance hemodialysis (MHD) patients (pts), in that lower BMI is associated with increased death risk, whereas higher BMI appears protective.

There is controversy as to whether this BMI-survival relationship is due to the increased muscle or body fat mass.

We assessed the association between the death risk and both mid-arm muscle circumference (MAMC) and triceps skinfold thickness (TSF) which are simple and noninvasive measures of muscle and fat mass, respectively.

METHODOLOGY

- The *Nutrition and Inflammation Evaluation in Dialysis Patients* (NIED) Study (www.NIEDstudy.org) is an NIH/NIDDK sponsored prospective cohort study, which was conducted during 2001 to 2006.
- Caliper anthropometry and other body composition tests were performed in 798 MHD pts from 8 DaVita[®] dialysis clinics in Los Angeles South Bay area.
- Survival up to 5 years was examined using Cox models.

RESULTS

Table 1. Mid-Arm Muscle Circumference (MAMC) Quartiles and 5-Year Death Hazard Ratios

MAMC quartiles	Unadjusted HR (95% CI)	Case Mix HR (95% CI)	Case Mix-MCIS HR (95% CI)	Case Mix-MICS-Inflammation HR (95% CI)
Q1	1.00 (reference)	1.00	1.00	1.00
Q2	1.06 (0.75,1.52)	0.89 (0.62,1.28)	0.73 (0.50,1.08)	0.73 (0.49,1.07)
Q3	1.06 (0.74,1.52)	0.96 (0.65,1.42)	0.88 (0.58,1.32)	0.87 (0.58,1.31)
Q4	0.70 (0.47,1.04)	0.53 (0.34,0.83)*	0.54 (0.34,0.87)*	0.55 (0.34,0.88)*

*p<0.05

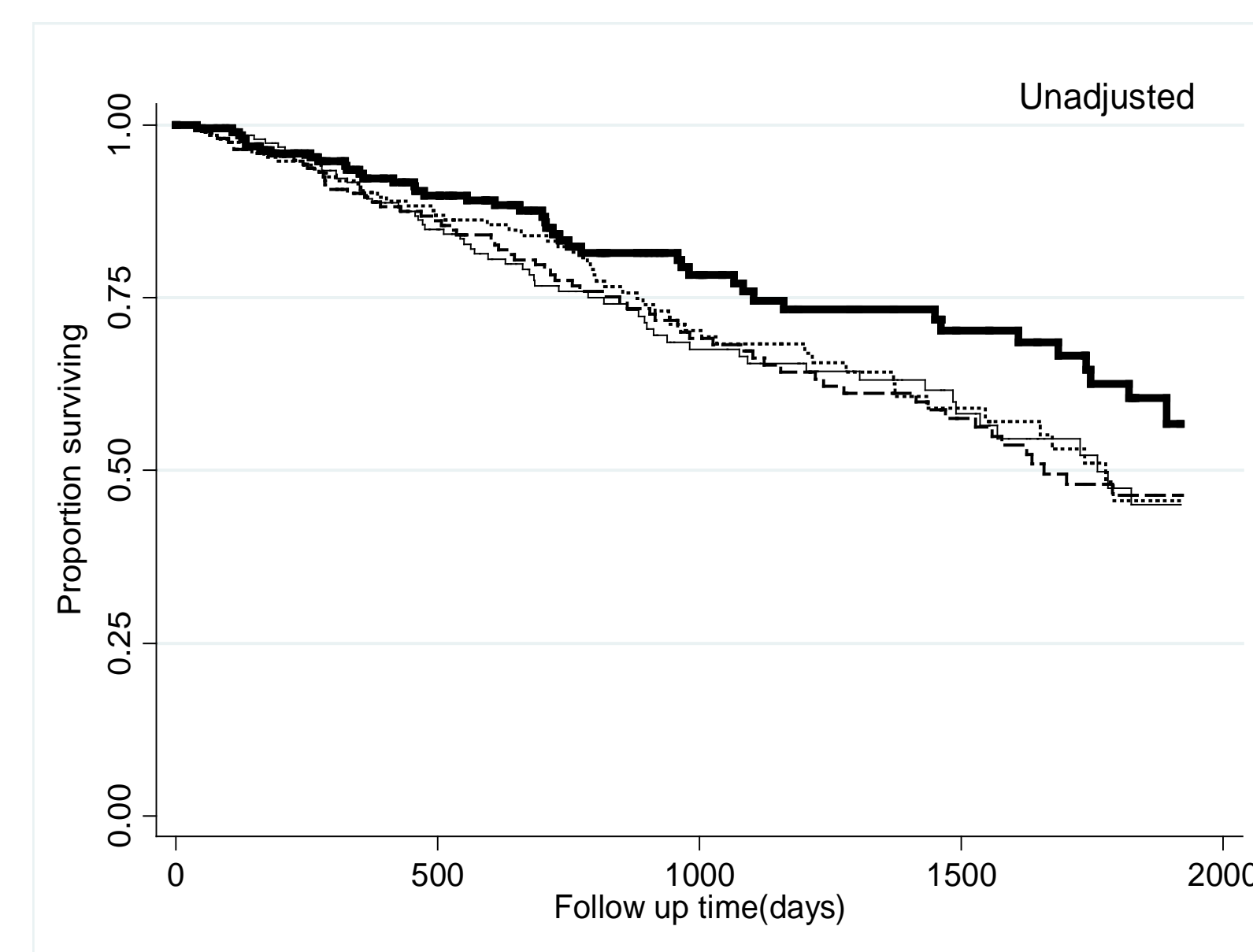


Figure 1. Kaplan-Meier proportion of surviving in MHD patients over 5 years across quartiles of MAMC

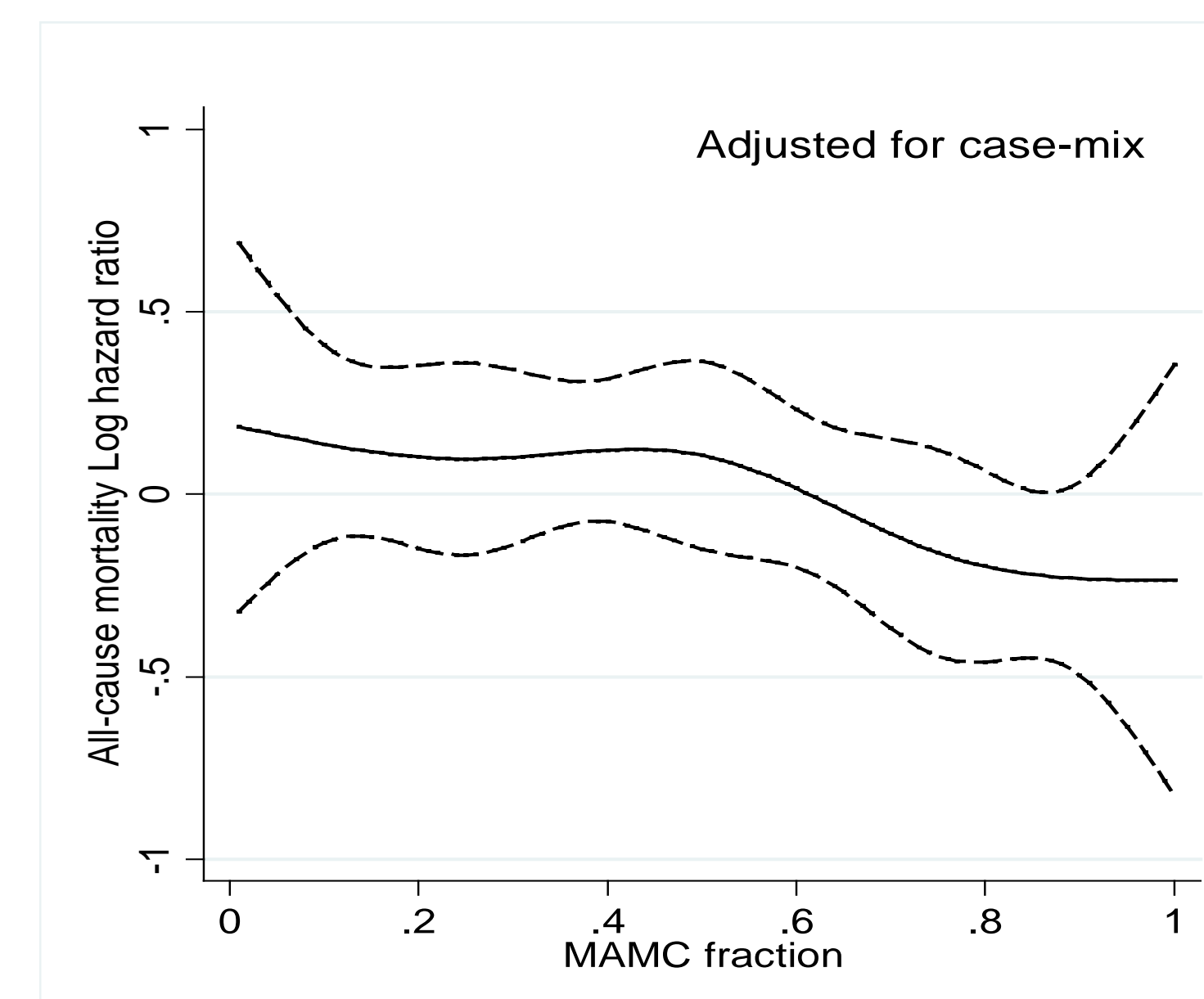


Figure 2. Cubic spline model of mortality predictability of MAMC in MHD patients over 5 years

CONCLUSIONS

- The hazard ratio of death tended to be below 1.0 with the higher 3 MAMC quartiles rose was significantly lower than reference only in patients in the highest MAMC quartile (<17.5[reference], 17.5-20.3, 20.4-23.2, >23.2 cm).
- This was observed in the case mix (age, gender, race/ethnicity, comorbidity, vintage, insurance, marital status, smoking, Kt/V), case mix and malnutrition-inflammation complex syndrome (MICS, BMI, EPO dose, serum Alb, Cr, Ca, P, ferritin and TIBC, hemoglobin, WBC, %lymphocytes, nPNA) and case mix, MICS and inflammation (CRP, IL-6 and TNF α) adjusted models.
- There were no significant differences in the hazard ratio of death between the quartiles of TSF.

KEY LEARNINGS

- ✓ In MHD pts, higher MAMC is associated with lower all cause mortality risk.
- ✓ Increased muscle mass is associated with greater survival in MHD pts.

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*Correspondence: kamkal@ucla.edu