Survival-Predictability of Lean vs. Fat Mass in Hemodialysis Patients

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INTRODUCTION

- In maintenance hemodialysis (MHD) patients, higher body mass index (BMI) is associated with increased survival.
- Higher BMI may reflect higher fat mass, higher lean and muscle mass, or both.
- It is not clear whether lean body mass (LBM) or fat mass (FM) confers survival benefits of high BMI.
- We hypothesized that LBM is superior to FM in predicting greater survival in MHD patients.

METHODOLOGY

- 792 MHD patients were followed for 5 years (10/2001-12/2006).
- We categorized participants into four groups according to the near-infrared interactanace (NIR) measured LBM and FM above or below the median values at baseline:
  - (1) low LBM and low FM
  - (2) high LBM but low FM
  - (3) Low LBM but high FM
  - (4) high LBM and high FM
- Unadjusted and case-mix-adjusted death hazard ratios (HR) and 95% confidence intervals (CI) were estimated using Cox proportional hazard models.
- We employed Cox regression based survival models to examine the association of LBM and FM with 5-year survival in the MHD patients cohort, adjusted for case-mix and other pertinent variables including surrogate of malnutrition-inflammation complex syndrome (MICS).

RESULTS

- Both higher LBM and FM appeared associated with greater survival in Spline survival models.
- Kaplan-Meier analysis showed that MHD patients in Group 1 (reference) had the highest mortality and Group 2 (high LBM but low FM) the greatest survival.
- The unadjusted and case-mix adjusted death HR (95% CI) in Groups 2, 3 and 4 (compared to Group 1) were 0.62 (0.42, 0.92), 0.94 (0.66, 1.33), and 0.90 (0.62, 1.31); and 0.59 (0.37, 0.97), 0.65 (0.43 0.95), and 0.68 (0.45, 1.04), respectively (Figure 1).

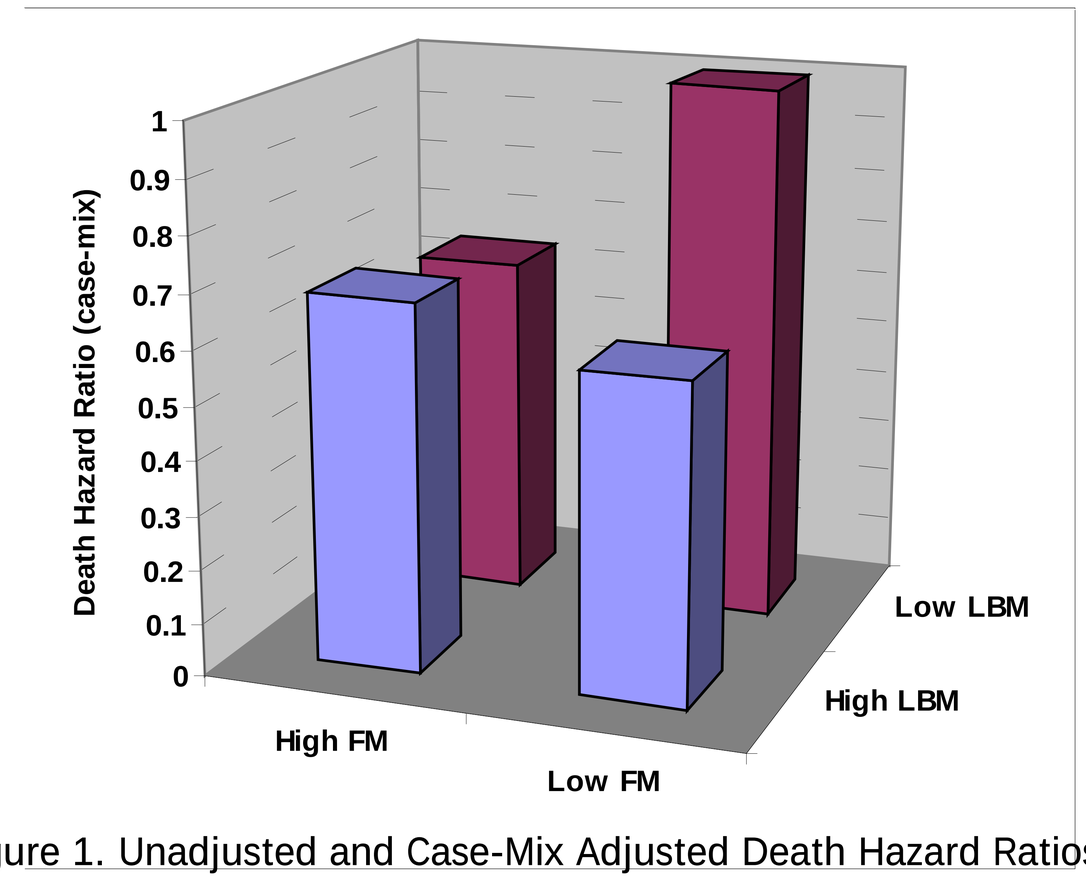

Figure 1. Unadjusted and Case-Mix Adjusted Death Hazard Ratios

CONCLUSIONS

- In this observational cohort study, MHD patients with higher LBM but lower FM had the greatest survival over 5 years.
- Prospective trials which examine the ability of sacropenia-improving interventions may be warranted in this population.

KEY LEARNINGS

- ✓ In MHD patients higher LBM, a surrogate of total muscle mass, is associated with greater survival in linear and incremental format.
- ✓ Through nutritional and pharmacologic intervention to correct protein-energy wasting and sarcopenia, LBM and muscle mass may also increase in MHD patients. It is possible this may improve survival in MHD patients but this hypothesis needs to be proven in randomized controlled trials.

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