

# Associations of Pre-Transplant Obesity and Muscle Mass with Mortality in Renal Transplant Recipients

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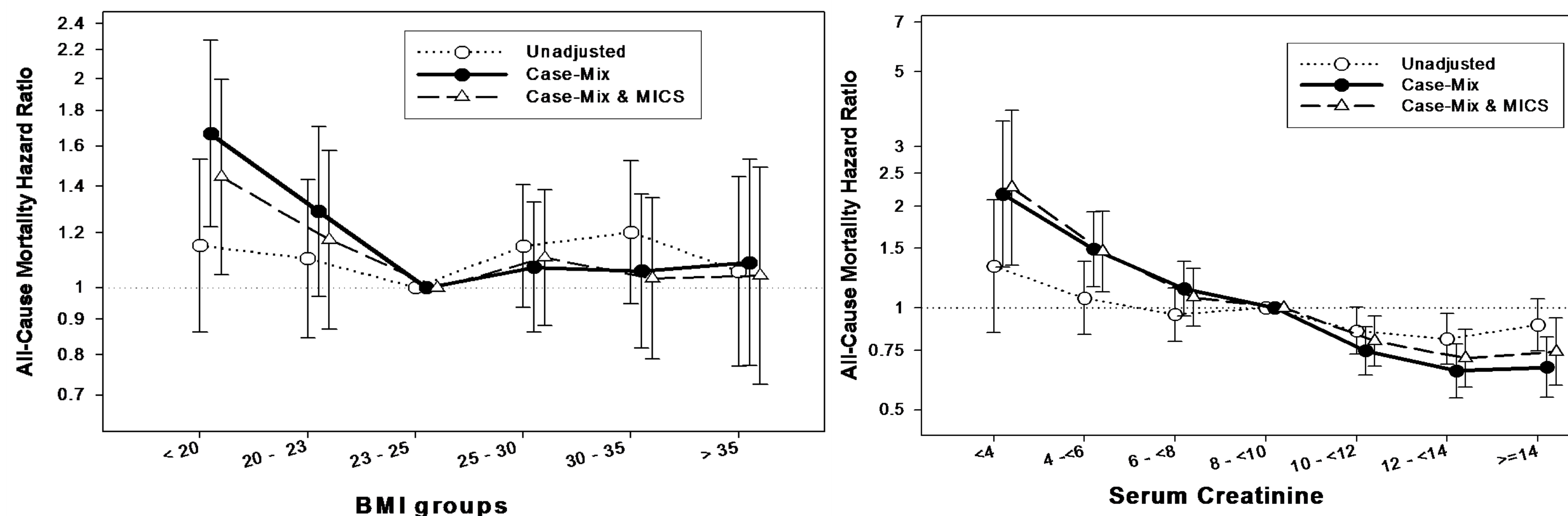
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## INTRODUCTION

- The association between pre-transplant body composition and post-transplant graft and patient survival in renal transplant recipients is not clear.
- Certain transplant centers exclude patients with a body mass index (BMI) greater than 30 or 35kg/m<sup>2</sup> from the transplant waitlist and refer such patients for weight reduction strategies such as bariatric surgery.
- In a recent report BMI ≥35 kg/m<sup>2</sup> was the third most common reason to deny patients to be transplant-waitlisted affecting 10% of potential renal transplant candidates.
- BMI is unable to differentiate between adiposity and muscle mass.
- Pre-transplant serum creatinine is a surrogate marker of muscle mass.
- We hypothesized that higher **estimated muscle mass**, represented by pre-transplant **serum creatinine level**, and **larger body size**, represented by higher **body mass index (BMI)**, are associated with **better post-transplant outcomes**.

## METHODS & RESULTS

- Linking the 5-year patient data of a large dialysis organization (DaVita) to the Scientific Registry of Transplant Recipients, we identified 10,090 maintenance hemodialysis patients who underwent their first kidney transplantation during the 7/2001-6/2007 period.
- Renal transplant recipients were 49±13 years old and included 49% women and 45% diabetics.
- Increased mortality and worse combined patient and graft survival were associated with pre-transplant BMI <20 kg/m<sup>2</sup>, whereas higher BMI values (>25 kg/m<sup>2</sup>) were not associated with increased mortality or graft loss (see Figure 1).
- There was a 2.3-fold increased risk of combined death and graft loss with the pre-transplant serum creatinine <4 mg/dL (p=0.002), whereas creatinine >14 mg/dL exhibited 26% greater graft and patient survival (p=0.01, reference: creatinine 8 to <10 mg/dL) (see Figure 2).



**Figure 1-2.** Hazard ratios (95% confidence intervals) of **post-transplant graft censored death** across the pre-transplant BMI (Figure 1) and creatinine (Figure 2) categories, using Cox regression analyses in 10,090 long-term MHD transplant patients who underwent renal transplantation and who were observed over a 6-year observation period (7/2001-6/2007)

## CONCLUSIONS

- Low pre-transplant BMI or serum creatinine levels are associated with the worst post-transplant outcomes, whereas highest pre-transplant serum creatinine, a surrogate of larger muscle mass, is associated with the best post-transplant graft and patient survival.

## KEY LEARNINGS

- ✓ Pre-transplant low BMI (<23 kg/m<sup>2</sup>), and not obesity, shows a trend towards higher post-transplant mortality.
- ✓ Lower pre-transplant serum creatinine level in MHD patients, a potential surrogate of sarcopenia, is associated with the worse post-transplant outcomes.
- ✓ Additional studies are needed to better understand the association between obesity, muscle mass and other body composition and clinical outcomes after kidney transplantation. Until then we caution against categorical recommendation of weight loss to apparently obese dialysis patients as a requirement for transplant wait-listing.

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