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Pre-Donation Obesity and Kidney Function in Living Kidney Donors

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Objectives: Obesity is a known risk factor for chronic kidney disease. The association between obesity status and kidney function in living kidney donors (LKD) is unclear.

Methods: A retrospective cohort study using SRTR data included LKD donating their kidneys from June 14, 1972 to September 28, 2022. The association between 3 categorized BMI (<25 (normal weight), 25 - <30 (overweight), and ≥30 (obesity)) and time-to-outcome of increased serum creatinine (SCr) >35% from pre-donation SCr was evaluated by multiple Cox proportional hazard regression analysis.

Results: Of 136,814 LKD, mean±SD age was 42±12 years and 61% were female. The majority had pre-donation overweight (41%) followed by normal weight (36%) and obesity (23%). Median (IQR) BMI of 22.81 (21.30, 23.96), 27.35 (26.16, 28.57), and 32.19 (30.96, 33.97) for normal weight, overweight, and obesity groups, respectively (Figure 1A). Mean SCr at pre-donation, 6, 12, and 24 months post-donation were 0.85±0.19, 1.22±0.30, 1.19±0.30, and 1.157±0.27, respectively (Figure 1B). Increased SCr from pre-donation SCr at 6, 12, and 24 months post-donation were 0.46±0.30, 0.43±0.31, and 0.41±0.27 mg/dL, respectively. Compared to the normal weight group, overweight and obesity groups had 1.07 and 1.08 times greater risk for an increase in post-donation SCr from pre-donation SCr, respectively (HR_{overweight} 1.07, 95%CI 1.05, 1.09, P <0.001; HR_{obesity} 1.08, 95%CI 1.06, 1.11, P <0.001; Figure 2). After adjusting for demographics, pre-donation SBP and DBP, pre-donation SCr, and post-donation urine protein, the magnitude and direction of the association between the obesity status and increased SCr remained (HR_{overweight} 1.06, 95%CI 1.03, 1.09, P <0.001; HR_{obesity} 1.08, 95%CI 1.04, 1.127, P <0.001).

Conclusions: LKD with pre-donation overweight and obesity increase the risk for elevated SCr post-donation compared to those with normal weight. Weight management during the pre-donation period should be implemented to mitigate the risk of worsening kidney function post-donation.

Figure 1

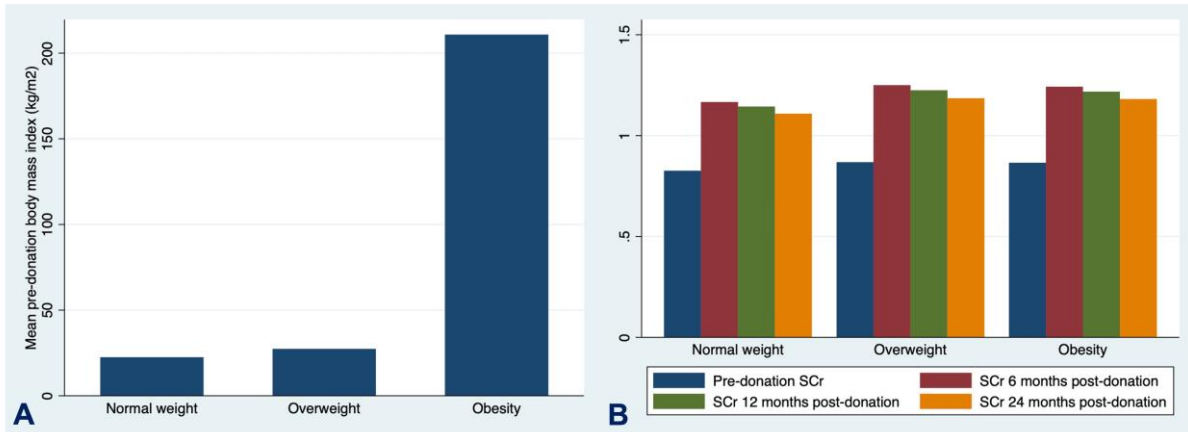


Figure 1: Distribution of the study population by body mass index (A) and body mass index stratified by time pre- and post-donation (B)

Figure 2

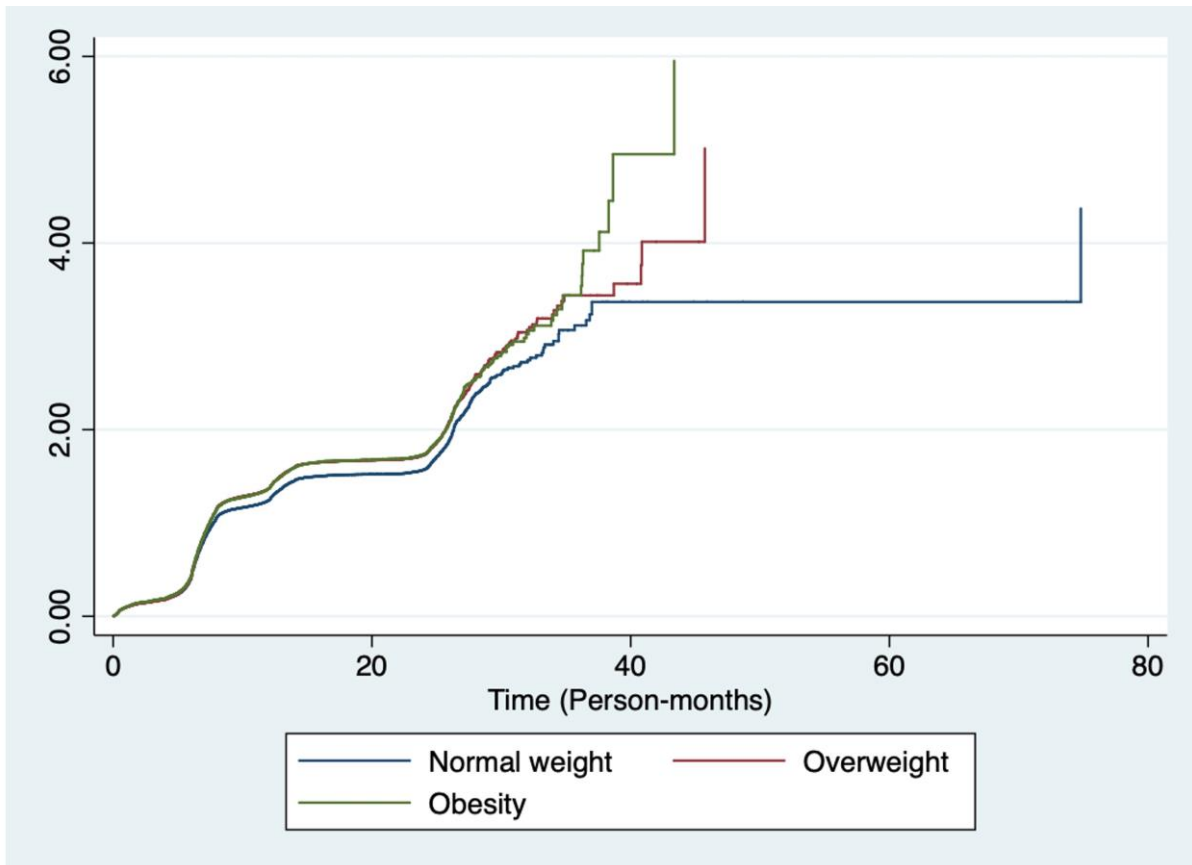


Figure 2: Cumulative hazard of increased serum creatinine post-donation