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Computed Tomography-Measured Subcutaneous Adiposity as Protective Factor in Patients with Sepsis-Associated Acute Kidney Injury Undergoing Continuous Renal Replacement Therapy

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Objectives : The obesity paradox, a phenomenon in which obese patients exhibit improved survival compared to normal-weight patients, has been observed across various clinical settings, including sepsis. However, body mass index does not adequately reflect adipose tissue composition. This study aimed to investigate the association between abdominal adiposity and mortality among patients with sepsis-associated acute kidney injury (AKI) undergoing continuous renal replacement therapy (CRRT).
Methods : Between 2011 and 2022, 1,390 adult patients with sepsis-associated AKI requiring CRRT were identified at Presbyterian Medical Center. Patients on hemodialysis or peritoneal dialysis, those who died within 24 hours of CRRT initiation, and those with missing data were excluded. Ultimately, 331 patients were included in our study. Subcutaneous adipose tissue (SAT) and visceral adipose tissue (VAT) areas were quantified at the L4–L5 level from abdominal computed tomography scans (Figure 1). Patients were divided into tertiles based on their VAT or SAT values. For each parameter, those in the second tertile were established as the reference group, while those in the first and third tertiles were defined as the low and high groups, respectively. The primary outcome was 28-day mortality and the secondary outcomes were length of intensive care unit (ICU) and hospital stays.
Results : In the high SAT group, 28-day survival was superior compared to the reference group, with no such difference noted in the low SAT group (Figure 2A). In contrast, no significant difference in 28-day survival was observed between groups based on VAT values (Figure 2B). An adjusted Cox model analysis indicated that a high SAT reduced the 28-day mortality risk (hazard ratio: 0.636; confidence interval: 0.433–0.933). No significant difference in length of ICU or hospital stay was noted by VAT or SAT.
Conclusions : SAT, but not VAT, may provide a protective effect in patients with sepsis-associated AKI requiring CRRT.

Figure 1.jpg

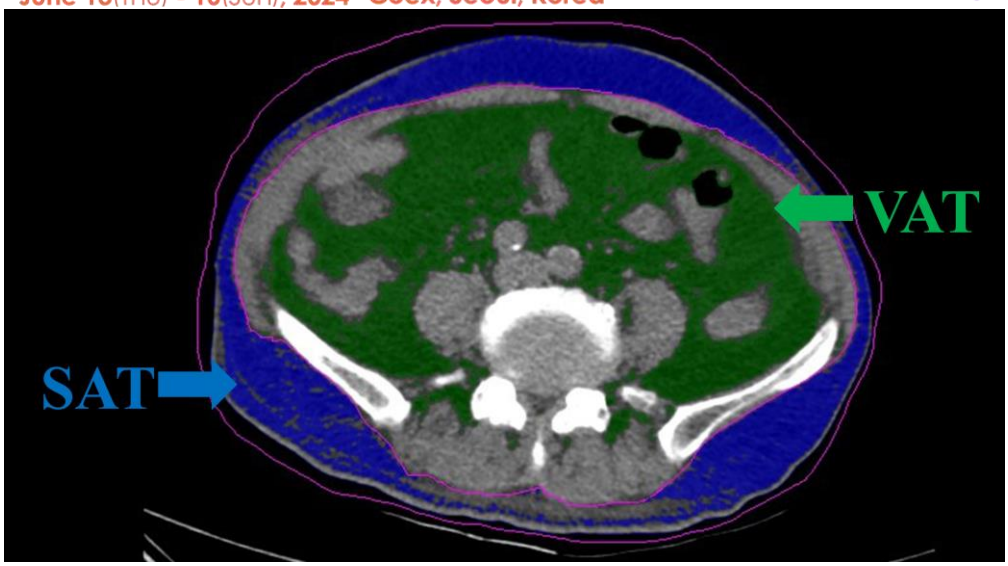
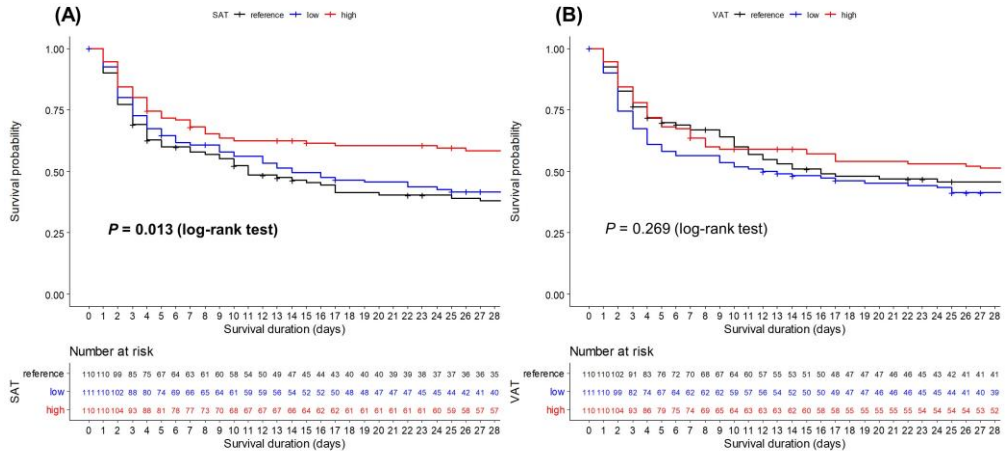

VAT
SAT

Figure 1.jpg


(A)
SAT reference low high
Survival probability
P = 0.013 (log-rank test)
Survival duration (days)
Number at risk
reference
low
high
(B)
VAT reference low high
P = 0.269 (log-rank test)