AKI-KRT in Allogeneic-HSCT Patients Admitted to the ICU: Incidence, Risk Factors, and Outcomes

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Background
Acute kidney injury (AKI) following allogeneic hematopoietic stem cell transplantation (aHSCT) is a common complication associated with substantial morbidity and mortality. Those who develop AKI treated with kidney replacement therapy (AKI-KRT) have even higher mortality. Few studies have investigated the incidence, risk factors, and outcomes associated with AKI-KRT in critically ill patients following aHSCT.

Methods
We performed a retrospective cohort study of 179 patients admitted to an ICU within 1 year following aHSCT (transplanted between 2013 and 2019) at two academic medical centers in Boston, MA. Data on demographics, comorbidities, lab values, medications, and clinical outcomes were obtained through both automated and manual review of medical records. We assessed independent risk factors for development of AKI-KRT using multivariable logistic regression. We assessed mortality during hospital admission and at 3- and 6-months after ICU admission according to maximum KDIGO AKI stage during ICU admission.

Results
A total of 42 of 179 patients (23.5%) developed AKI-KRT during ICU admission. Independent risk factors for AKI-KRT included veno-occlusive disease (VOD) and thrombotic microangiopathy (TMA) prior to ICU admission, receipt of invasive mechanical ventilation on ICU admission, and admission to the ICU within 180 days following aHSCT (Figure 1A). Mortality increased with higher AKI stage, and was highest in those with AKI-KRT, reaching 78.6% during hospitalization and 88.1% at 6 months (Figure 1B).

Conclusion
Among aHSCT patients admitted to the ICU, independent risk factors for AKI-KRT included VOD, TMA, receipt of invasive mechanical ventilation, and admission to the ICU within 180 days following aHSCT. Nearly 90% of patients who developed AKI-KRT died within 6 months of ICU admission.
**Figure A.** Independent risk factors for AKI-KRT. *Odds ratios are adjusted for each of the four variables shown above.

**Figure B.** Mortality at hospital discharge and 3- and 6-months following ICU admission, stratified by AKI stage.