MM-970 Early AKI and Mortality in Critically Ill Patients With Multiple Myeloma: A Two-Cohort Study

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INTRODUCTION

- Acute kidney injury (AKI) is a frequent complication in multiple myeloma (MM), driven by cast nephropathy, hypercalcemia, and nephrotoxic exposures.
- When MM patients develop critical illness requiring intensive care unit (ICU) admission, renal dysfunction can severely compromise hemodynamic management and systemic therapy delivery.
- Multi-center validation of early AKI as an actionable, bedside prognostic marker in modern critically ill MM cohorts remains limited.

AIM

- **Primary Aim:** Quantify the prognostic impact of early AKI (first 24 hours of ICU admission) on in-hospital and ICU mortality among critically ill MM patients.

- **Secondary Aim:** Evaluate the cross-cohort reproducibility of early AKI-associated risk across two independent electronic health record databases (MIMIC-IV and eICU-CRD).

METHOD

Study Design & Databases: Multi-center retrospective cohort study utilizing **MIMIC-IV** (single-center tertiary academic medical center) and **eICU-CRD** (multi-center national database).
Study Population: Adult ICU admissions with diagnosed multiple myeloma.
Exposure: Early AKI defined by serum creatinine kinetics during the first 24 hours of ICU stay.
Statistical Analysis: Multivariable logistic regression modeling hospital and ICU mortality independently within each cohort, adjusting for baseline demographics and confounders.

CONCLUSIONS

- Early AKI is a common, highly reproducible marker of excess mortality in critically ill patients with multiple myeloma.

- The consistent >3-fold increase in ICU mortality underscores that serum creatinine kinetics within the first 24 hours provide an immediate, accessible bedside tool for risk stratification, prompting early nephroprotective measures, volume optimization, and renal-adjusted oncologic dosing.

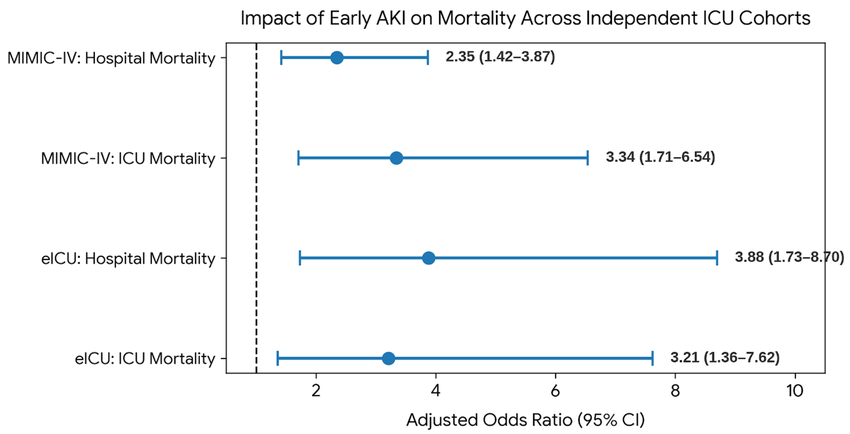
RESULTS

Cohort	Total MM Patients	Early AKI Prevalence	Hospital Mortality (AKI vs. No AKI)	Adjusted Odds Ratio (95% CI)	ICU Mortality (AKI vs. No AKI)	Adjusted Odds Ratio (95% CI)
MIMIC-IV	427	28.6% (n=122)	29.5% vs. 15.1%	**2.35** (1.42–3.87)	17.2% vs. 5.9%	**3.34** (1.71–6.54)
eICU-CRD	228	20.2% (n=46)	45.7% vs. 18.1%	**3.88** (1.73–8.70)	32.6% vs. 13.2%	**3.21** (1.36–7.62)

Results

•Early AKI occurred in **20–29%** of critically ill MM admissions across both datasets.

•In both cohorts, early AKI was independently associated with a **>2-fold increase in hospital mortality** and a **>3-fold increase in ICU mortality** after multivariable adjustment.



Caption: Figure 1. Adjusted Odds of Mortality Associated with Early AKI in Critically Ill Multiple Myeloma Patients. Multivariable logistic regression models demonstrated consistent, statistically significant 2- to 4-fold increased odds of both ICU and hospital mortality among MM patients developing AKI within the first 24 hours of ICU admission across two independent multi-center cohorts (MIMIC-IV and eICU-CRD).

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