

Frailty as an Independent Determinant of Inpatient Mortality and Discharge Transitions in Multiple Myeloma: A Nationwide Analysis Using the Hospital Frailty Risk Score

Aayushi Pareek, MD¹, Sai D. Yeramalla¹, MBBS, Isam Abdel-Karim, MD, MSCI, MHA³

¹St. Bernards Medical Center, Jonesboro, AR, USA

²St. Bernards Cancer Center, Jonesboro, AR, USA



INTRODUCTION

Multiple myeloma (MM) predominantly affects older adults, a population at high risk for frailty. While frailty is increasingly recognized as a determinant of treatment tolerance in MM, its impact on inpatient outcomes and healthcare resource utilization at a national level remains poorly characterized.

AIM

To determine whether frailty, measured by the Hospital Frailty Risk Score (HFRS), is independently associated with in-hospital mortality.

METHOD

Retrospective cross-sectional analysis of the National Inpatient Sample (NIS), 2019-2020. Adult hospitalizations with MM identified using ICD-10-CM codes C90.00-C90.02 in any diagnosis position were included. After applying survey weights, the cohort represented 235,540 weighted hospitalizations (47,108 unweighted). Frailty was quantified using the validated HFRS, with patients classified as non-frail (HFRS <5) or frail (HFRS ≥5).

CONCLUSIONS

Frailty as measured by HFRS, is a significant independent predictor of inpatient mortality and resource utilization in MM hospitalizations across the United States. These findings highlight the need for routine frailty screening in hospitalized MM patients to guide clinical decision-making, proactive palliative care involvement, and discharge planning.

RESULTS

Among the cohort, 80.0% were non-frail and 20.0% were frail. Median age was 71 years, 44.0% were female, and 69.0% carried Medicare as primary insurance.

Main Outcome Measures: Primary outcome was in-hospital mortality. Secondary outcomes were non-routine discharge (to skilled nursing facility, long-term acute care, or rehabilitation) and prolonged length of stay (LOS), defined as exceeding the 75th percentile (>9 days).

Results: Frail patients (HFRS ≥5) had significantly higher rates of all adverse outcomes compared to non-frail patients. On multivariable logistic regression adjusting for age, sex, race, insurance, comorbidity burden, hospital characteristics, admission type, and year, frailty was independently associated with increased in-hospital mortality (aOR 1.43, 95% CI 1.30-1.57), non-routine discharge (aOR 2.70, 95% CI 2.55-2.85), and prolonged LOS (aOR 2.31, 95% CI 2.19-2.43), all p<0.001. Each one-point increase in continuous HFRS was associated with a 4% increase in mortality odds (aOR 1.04, 95% CI 1.03-1.05, p<0.001).

ACKNOWLEDGEMENTS

We acknowledge the Healthcare Cost and Utilization Project (HCUP) for providing access to the National Inpatient Sample (NIS) database. We also thank our mentors and research collaborators for their guidance and support throughout this project.

CONTACT INFORMATION

Dr. Aayushi Pareek, MD
apareek@sbrmc.org

REFERENCES

1. Gilbert T, Neuburger J, Kraindler J, et al. Development and validation of a Hospital Frailty Risk Score focusing on older people in acute care settings using electronic hospital records: an observational study. *Lancet*. 2018;391(10132):1775-1782.
2. Pianko MJ, Mian HS, Schoenbeck KL, Wildes TM. Frailty measures in multiple myeloma: evaluating the impact on outcomes and quality-of-life in clinical trials and real-world practice. *Leuk Lymphoma*. 2025;66(2):190-203. doi:10.1080/10428194.2024.2419375