Clinical Outcomes and Economic Burden of Myeloid Sarcoma: Insights from The National Inpatient Sample (NIS) - 2021

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Background

Myeloid sarcoma, also known as granulocytic sarcoma, is a rare extramedullary manifestation of acute myeloid leukemia (AML) characterized by the formation of solid tumors outside the bone marrow. These tumors can occur in various anatomic sites, including the skin, lymph nodes, gastrointestinal tract, and central nervous system. Myeloid sarcoma is often difficult to diagnose due to its nonspecific clinical presentation and the necessity for histopathological confirmation. As a result, there is a risk of delayed or misdiagnosis, leading to suboptimal treatment outcomes. Given the rarity of myeloid sarcoma, there is limited literature on its epidemiology, clinical characteristics, and healthcare burden. This study aims to fill this gap by utilizing the National Inpatient Sample (NIS) dataset to explore the demographic profiles, clinical outcomes, and healthcare utilization patterns of patients diagnosed with myeloid sarcoma in the United States.

Methods

We conducted a retrospective cohort study utilizing NIS data from 2021. Myeloid sarcoma cases were identified using the ICD-10 code C92.3. Descriptive statistics, linear, and logistic regression models were employed to assess demographic distributions, comorbidities, length of stay (LOS), hospital charges, and hospital mortality. Several potential confounding factors were adjusted for in the analysis, including age, gender, race, median household income quartile, Charlson Comorbidity Index, admission during a weekend, hospital region, hospital teaching status, and hospital bed count. These factors were selected based on their potential impact on outcomes and healthcare utilization.

Results

A total of 1,570 cases of myeloid sarcoma were identified. The gender distribution was 55.27% male and 44.73% female, with a mean age of 47.52 years (95% CI: 44.42 - 50.62). The racial distribution was predominantly White (66.89%), followed by Black (17.38%), Hispanic (6.23%), and Asian/Pacific Islander (6.56%). Most patients resided in higher median household income quartiles (Q4: 35.05%, Q4 > $88,000).

The overall hospital mortality rate for myeloid sarcoma was 7.32% (95% CI: 4.74% - 11.16%). Logistic regression revealed significant predictors of mortality including race (Black vs. White: OR: 7.03, 95% CI: 1.57 - 31.53, p = 0.011), Charlson Comorbidity Index (OR: 1.35, 95% CI: 1.08 - 1.69, p = 0.008), and median household income (Q4 vs. Q1: OR: 0.25, 95% CI: 0.08 - 0.78, p = 0.017, Q4 > $88,000 & Q1 < $52,000).

The mean LOS was 15.62 days (95% CI: 13.18 - 18.07). Adjusted regression showed significant associations with hospital teaching status (teaching vs. non-teaching: β = 8.55, p = 0.001) and region (Northeast vs. South: β = 8.14, p=0.023). The mean total hospitalization charges were $246,888.60 (95% CI: $181,154 - $312,623). Adjusted regression indicated significant predictors, including hospital teaching status (teaching vs. non-teaching: β = 173,169.90, p<0.001).

Table 1 : Demographics, Mortality, Length of Stay and Hospitalization Charges

Total cases of Myeloid Sarcoma	1570	**Overall hospital mortality rate for myeloid sarcoma**	7.32% (95% CI: 4.74% - 11.16%)
Gender distribution (Male)	55.27%	**Hospital mortality (Black vs. White)**	OR: 7.03 (95% CI: 1.57 - 31.53) p = 0.008
Gender distribution (Female)	44.73%	**Hospital mortality (Charlson Comorbidity Index)**	OR: 1.35 (95% CI: 1.08 - 1.69) p = 0.017
Mean age	47.52 (95% CI: 44.42 - 50.62)	**Hospital mortality (Income Q4 vs. Q1)**	OR: 0.25 (95% CI: 0.08 - 0.78)
Racial distribution (White)	66.89%	**Mean length of stay (LOS)**	15.62 days (95% CI: 13.18 - 18.07) p = 0.001
Racial distribution (Black)	17.38%	**LOS (Hospital teaching status)**	β = 8.55 p = 0.023
Racial distribution (Hispanic)	6.23%	**LOS (Region: Northeast vs. South)**	β = 8.14 p = 0.023
Racial distribution (Asian/Pacific Islander)	6.56%	**Mean total hospitalization charges**	$246,888.60 (95% CI: $181,154 - $312,623) p < 0.001
Income Quartile Q4 (>$88,000)	35.05%	**Total hospitalization charges (Hospital teaching status)**	β = 173,169.90

Conclusion

Patients with myeloid sarcoma face considerable healthcare burdens with substantial LOS and hospitalization costs. Mortality is significantly influenced by race and comorbidities highlighting the need for targeted interventions and equitable healthcare access. Given the high economic burden strategies should be developed to optimize resource allocation and reduce healthcare costs associated with the management of myeloid sarcoma. Future studies should explore specific treatment modalities and long-term outcomes in this patient population.