Analysis of Multiple Myeloma Discharge Trends in the United States: Influence of Hospital Type, Size, and Geographic Region (2011-2019).

Zeeshan Solangi MD, FACP[1,2,3], Murtaza Shah MD[4], Amirta Devi MD[5], Raj Kanwal MBBS[6], Emeka Agudile MD[7], Hasnain Ali Moryani MBBS[8], FNU Farzeela MBBS[9], Ahda Solangi MD[10], Siraj Ahmed MBBS[8], Olga Kozyrova MD[11], Darren Evanchuk MD

Yale

Introduction

With the advent of novel therapies, patients with multiple myeloma are living longer, though it remains a chronic illness often complicated by pathological fractures and renal failure, requiring hospitalization. These patients are commonly referred to tertiary care hospitals for multidisciplinary care, including hematologists, orthopedic oncologists, and nephrologists. However, population-based data on variations in multiple myeloma-related hospitalizations in the U.S. are lacking.

Methods

This study examined variations in multiple myeloma discharges across U.S. hospitals from 2011 to 2019, based on hospital type, size, and geographic region, using the Nationwide Inpatient Sample (NIS). The study population included adults aged 18 and older with a primary discharge diagnosis of multiple myeloma, plasmacytoma, or plasma cell leukemia (ICD codes). Statistical analyses were performed using Stata version 15.1. Discharge weights accounted for the NIS sampling design, with a p-value of <0.05 considered statistically significant.

Multiple Myeloma Discharge Trends by Hospital Type and Geographic Region (2011-2019)

Multiple Myeloma Discharge Trends by Hospital Type

Hospital Type	2011 Rate (per 10,000)	2019 Rate (per 10,000)	% Increase	Relative Risk (RR)
Urban Teaching	29.46	38.64	31%	1.261
Urban Non-teaching	22.96	29.38	28%	1.116
Rural	20.27	24.49	21%	1.106

Larger institutions handled the majority of cases, accounting for 68.38% of discharges in 2011 and 55.66% in 2019.

Geographic Distribution of Multiple Myeloma Discharges

Region	2011 Frequency (per 10,000)	2019 Frequency (per 10,000)	% Increase	% of Total Discharges (2011)	% of Total Discharges (2019)	Relative Risk (RR)
South	N/A	N/A	37.3%	38.24%	38.69%	1.041
Midwest	26.73	N/A	33.6%	N/A	N/A	1.051
Northeast	N/A	40.62	39.7%	N/A	N/A	1.078
West	21.43	33.45	56.1%	N/A	N/A	1.066

Results

The study found that urban teaching hospitals had the highest absolute number and frequency of multiple myeloma discharges (29.46 per 10,000 in 2011, increasing to 38.64 per 10,000 in 2019; RR 1.261, 95% CI 1.255-1.268, P<0.001). This was followed by urban non-teaching (22.96 to 29.38 per 10,000; RR 1.116, 95% CI 1.102-1.126, P<0.001) and rural hospitals (20.27 to 24.49 per 10,000; RR 1.106, 95% CI 1.095-1.116, P<0.001). Discharges increased across all hospital sizes (P<0.001), with the largest hospitals accounting for the highest numbers in both 2011 (68.38%) and 2019 (55.66%).

The South had the most discharges in both 2011 (38.24%) and 2019 (38.69%). The highest relative frequency was in the Midwest in 2011 (26.73 per 10,000) and the Northeast in 2019 (40.62 per 10,000). The West had the largest increase (56.1%, from 21.43 to 33.45 per 10,000; RR 1.066, 95% CI 1.059-1.073, P<0.001), followed by the Northeast (39.7%; RR 1.078, 95% CI 1.069-1.083, P<0.001), South (37.3%; RR 1.041, 95% CI 1.035-1.047, P<0.001), and Midwest (33.6%; RR 1.051, 95% CI 1.044-1.057, P<0.001).

Conclusion

This study highlights geographical variations in multiple myeloma hospitalizations in the U.S. Further research is needed to understand the underlying factors contributing to these variations and improve patient outcomes.