Association Of Pathological Fractures With Clinical Outcomes And Palliative Care Utilization In Multiple Myeloma Patients: A 3- And 5-year Real-world Analysis

Nnamdi Omenuko MD, MPH[1], Chidiebube Ugwu MD, MPH[2], Nneoma Ubah MD, MPH[3], Chukwuma Jideofor MD[4]

[1]East Tennessee State University, Johnson City, Tennessee, USA. [2]Jefferson Einstein Philadelphia Hospital, Philadelphia, Pennsylvania, USA. [3]Montefiore St. Luke's Cornwall Hospital, Newburgh, New York, USA. [4]University of Abuja Teaching Hospital, Gwagwalada, Abuja FCT, Nigeria

Introduction

-Pathological fractures are a common and debilitating complication of multiple myeloma (MM) that reflect advanced bone involvement or delayed diagnosis and may significantly impact patient outcomes and resource use.

-Understanding the inpatient burden of pathological fractures in MM patients is crucial for optimizing care and policy decisions.

Aim

-To evaluate 3- and 5-year clinical outcomes among MM patients with documented pathological fractures using real-world data from a large US health system network

Methods

-We analyzed electronic health records from the TriNetX US Collaborative Network (2000–2022).

-Adult patients with MM were stratified into two cohorts: those with and without pathological fractures at diagnosis.

-Propensity score matching was employed to control demographic covariates and baseline comorbidities.

-Outcomes included mortality, hospitalization, infections, organ dysfunction, palliative care use (PCU), and select lab metrics at 3 and 5 years. Risk ratios (RRs), 95% confidence intervals (CIs), and *P*-values were used to assess differences.

3-YEAR OUTCOMES

MORTALITY

5 death

Risk analysis excluding patients with outcome prior to the time window

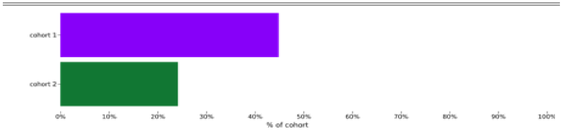
	Cohort	Patients in cohort	Patients with outcome	Risk
1	New MM in 2000-20 US pathological #	1,944	715	0.368
2	New MM in 2000-20 US no #	1,990	450	0.226

		95% CI	z	p
Risk Difference	0.142	(0.113, 0.170)	9.731	0.000
Risk Ratio	1.626	(1.472, 1.798)	N/A	N/A
Odds Ratio	1.991	(1.731, 2.290)	N/A	N/A



HOSPITALIZATION

		95% CI	z	p
Risk Difference	0.207	(0.170, 0.244)	10.874	0.000
Risk Ratio	1.855	(1.656, 2.077)	N/A	N/A
Odds Ratio	2.551	(2.150, 3.026)	N/A	N/A



Results

-A total of 5,120 matched patients were identified.

-At 3 years, patients with fractures had significantly higher mortality (31.1% vs 20.8%; RR, 1.49; 95% CI, 1.34–1.65; *P*<0.001), hospitalization (41.6% vs 24.9%; RR, 1.67; *P*<0.001), and PCU (22.0% vs 14.3%; RR, 1.54; *P*<0.001) compared with those without fractures.

-In the fracture group, infection risk was elevated (37.9% vs 29.4%; RR, 1.29; *P*<0.001) and hypercalcemia was more frequent (5.6% vs 3.4%; RR, 1.63; *P*=0.004), whereas ischemic heart disease (IHD) was significantly lower (8.9% vs 11.9%; RR, 0.75; *P*=0.007) compared with the no-fracture group.

-At 5 years, all-cause mortality remained significantly higher in the fracture group (43.0% vs 29.6%; RR, 1.45; *P*<0.001), as did hospitalization (48.1% vs 29.4%; RR, 1.63; *P*<0.001), infection rates (45.8% vs 36.1%; RR, 1.27; *P*<0.001), and PCU (26.6% vs 17.5%; RR, 1.52; *P*<0.001).

-Moreover, the differences in hypercalcemia risk (6.5% vs 4.0%; RR, 1.62; *P*=0.001) and IHD (10.7% vs 14.1%; RR, 0.76; *P*=0.003) persisted.

5- YEAR OUTCOMES-

MORTALITY

5 death

Risk analysis excluding patients with outcome prior to the time window

	Cohort	Patients in cohort	Patients with outcome	Risk
1	New MM in 2000-20 US pathological #	1,944	835	0.430
2	New MM in 2000-20 US no #	1,990	589	0.296

		95% CI	z	p
Risk Difference	0.134	(0.104, 0.163)	8.714	0.000
Risk Ratio	1.451	(1.333, 1.580)	N/A	N/A
Odds Ratio	1.791	(1.570, 2.043)	N/A	N/A



HOSPITALIZATION

		95% CI	z	p
Risk Difference	0.186	(0.148, 0.225)	9.528	0.000
Risk Ratio	1.634	(1.476, 1.808)	N/A	N/A
Odds Ratio	2.220	(1.882, 2.620)	N/A	N/A

Conclusion

-MM patients presenting with pathological fractures face significantly worse outcomes at both 3 and 5 years, including increased mortality and hospitalization, compared with those without pathological fractures.

-These findings highlight the prognostic importance of skeletal events and the need for timely integrated supportive strategies from diagnosis.

References

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