RACIAL DISPARITIES IN PLASMA CELL LEUKEMIA OUTCOMES AMONG HOSPITALIZED PATIENTS IN THE UNITED STATES

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INTRODUCTION

- Plasma cell leukemia (PCL) is a rare, aggressive subtype of multiple myeloma (MM) carrying a poor prognosis.
- Racial disparities in treatment outcomes and mortality for MM are likely related to both socioeconomic and genomic factors, well-demonstrated in multiple prior studies.
- Limited data exists for racial/ethnic differences in patients with PCL.

AIM

- To investigate whether racial differences exist in hospitalization outcomes for PCL patients using Nationwide Inpatient Sample (NIS) data.

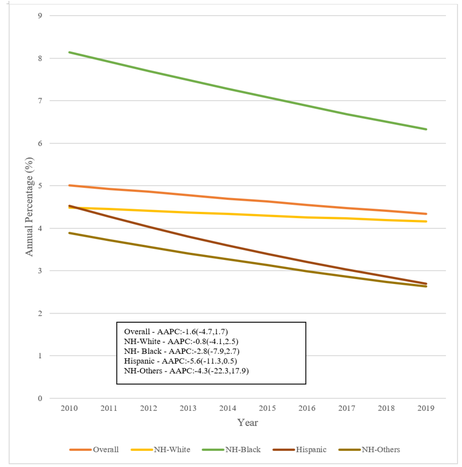
METHOD

- Data were derived from 2010-2019 NIS and included hospitalizations for adult patients with diagnosis of PCL. Descriptive statistics were used to estimate prevalence per 100,000 hospitalizations by age, sex, race/ethnicity, disposition, zip code income quartile, primary payer, hospital region and location, bed size, and teaching status (Table 1).
- Bivariate statistical significance was assessed using Pearson's chi-squared test. Joinpoint regression was used to analyze temporal trends for PCL stratified by race/ethnicity. Average Annual Percentage Change (AAPC) and 95% confidence intervals were used to represent rate of change of hospitalizations. Survey logistic regression models were built to assess association of sociodemographic factors and PCL hospitalizations. All tests of statistical significance were two-tailed with alpha set at 5%. IRB approval for this study was not required as data were de-identified.

RESULTS

- Overall, there was a tendency towards lower hospitalization rates across the cohort, with an AAPC of -1.6 (Figure 1).
- Among hospitalized PCL patients, there was no significant association between race/ethnicity and hospitalization rates, between Non-Hispanic (NH) White and Hispanic (OR 0.47;95% CI 0.05-4.23,p 0.5), NH Black (OR 1.94;95%CI 0.3-3.54,p 0.95), and NH-Others (OR 1.67;CI 0.47-5.89,p 0.42). Additionally, there was no association between gender (OR 1.52;95% CI 0.67-3.42,p 0.32) and hospitalizations, nor between age, income quartile, hospital characteristics, and insurance status and hospitalization rates.
- Notably, within this cohort hospitalization rates were not significantly associated with death (OR 1.85;CI 0.22-15.41,p 0.57) (Table 2).

Figure 1: Trends in plasma cell leukemia hospitalizations, by race/ethnicity - 2010-2019



AAPC = Average Annual Percentage Change, NH = Non-Hispanic

Table 1 Demographic characteristics of patients with plasma cell leukemia

	Total		Plasma cell leukemia		Prevalence per 100,000 hospitalizations	p-value
	N=504480139	%=100	N=14303	%=100		
Gender						<0.01
Male	226276359	41.47%	7669	53.62%	6.0731873	
Female	178096756	58.49%	6629	46.35%	3.7221445	
Missing	107724	0.04%	--	--	--	
Age						<0.01
18-39 years	74069571	24.31%	973	6.80%	1.3146948	
40-59 years	75799239	24.89%	4804	33.59%	6.3177943	
60-79 years	103746143	34.07%	7061	49.37%	6.8060362	
80+ years	50925186	16.73%	1465	10.24%	2.8787691	
Race/Ethnicity						<0.01
NH-White	195552023	64.22%	8495	59.39%	4.3441126	
NH-Black	43501544	14.29%	3179	22.23%	7.3077866	
Hispanic	31111965	10.22%	1122	7.84%	3.6055186	
NH-Others	17724049	5.82%	662	4.63%	3.7350382	
Missing	16583559	5.45%	844	5.90%	5.089378	
Disposition						<0.01
Routine	197456813	64.85%	6905	48.28%	3.4969672	
Transfer	53405931	18.20%	3157	22.07%	5.9079459	
Died	6661290	2.19%	1484	10.38%	22.277967	
DAMA	4123314	1.35%	75	0.52%	1.8181316	
Other	40639779	13.35%	2678	18.73%	6.5846815	
Missing	191211	0.06%	--	--	--	
Zip code Income quartile						<0.01
Lowest quartile	89832443	29.50%	3508	24.53%	3.9050479	
Second quartile	77223124	25.36%	3449	24.11%	4.4662788	
Third quartile	71316441	23.42%	3589	25.09%	5.0325091	
Highest quartile	59778208	19.63%	3487	24.24%	5.7996754	
Missing	6328919	2.08%	288	2.01%	4.5505401	
Primary Payer						<0.01
Medicare	142155872	46.69%	6372	44.55%	4.4824037	
Medicaid	52396258	17.18%	1629	11.39%	3.1149456	
Private Insurance	84605886	27.79%	5284	36.94%	6.2454284	
Self-Pay	24860100	8.16%	973	6.80%	3.9139022	
Other	562023	0.18%	45	0.31%	8.0067898	
Hospital Region						<0.01
Northeast	58223641	19.12%	2802	19.59%	4.8124781	
Midwest	68739179	22.59%	3120	21.81%	4.5354718	
South	118974793	39.07%	5474	38.27%	4.6009823	
West	58490825	19.21%	2906	20.32%	4.9683006	
Hospital Bed Size						<0.01
Small	52146784	17.13%	1573	11.00%	3.0164852	
Medium	83484697	27.55%	2595	18.14%	3.0935321	
Large	167672304	55.07%	10099	70.61%	6.0230579	
Missing	778354	0.25%	36	0.25%	4.6370599	
Hospital Location and Teaching Status						<0.01
Rural	31330118	10.29%	683	4.78%	2.1800109	
Urban non-teaching	93357895	30.35%	2387	16.69%	2.5845166	
Urban teaching	180015971	59.12%	11196	78.28%	6.2194482	
Missing	778354	0.25%	36	0.25%	4.6370599	

Table 2: Factors associated with plasma cell leukemia hospitalizations

	OR (95% CI)	p-values
Gender		
Male	reference	
Female	1.52(0.67-3.42)	0.32
Age		
18-39 years	reference	
40-59 years	3.78(0.77-18.52)	0.1
60-79 years	2.97(0.65-13.49)	0.16
80+ years	1.22(0.2-7.29)	0.83
Race/Ethnicity		
NH-White	reference	
NH-Black	1.04(0.3-3.54)	0.95
Hispanic	0.47(0.05-4.23)	0.5
NH-Others	1.67(0.47-5.89)	0.42
Disposition		
Routine	reference	
Transfer	1.17(0.45-3.05)	0.75
Died	1.85(0.22-15.41)	0.57
DAMA	--	--
Other	1.79(0.71-4.51)	0.22
Missing		
Zip code Income quartile		
Lowest quartile	reference	
Second quartile	1.06(0.28-4.01)	0.93
Third quartile	1.36(0.42-4.45)	0.61
Highest quartile	1.77(0.53-5.88)	0.35
Primary Payer		
Medicare	reference	
Medicaid	0.42(0.1-1.81)	0.24
Private Insurance	0.82(0.38-1.77)	0.62
Self-Pay	--	--
Hospital Region		
Northeast	reference	
Midwest	0.46(0.14-1.44)	0.18
South	0.62(0.24-1.64)	0.34
West	0.53(0.17-1.71)	0.29
Hospital Bed Size		
Small	reference	
Medium	1.51(0.28-8.16)	0.63
Large	4.31(0.99-18.77)	0.05
Hospital Location and Teaching Status		
Rural	reference	
Urban non-teaching	0.86(0.09-7.97)	0.9
Urban teaching	3.32(0.43-25.68)	0.25

DAMA = Discharged against medical advice

CONCLUSIONS

- There was no significant difference between racial groups in hospitalizations or hospitalization-related mortality for patients with PCL, suggesting that the same factors driving increased hospitalization rates in MM for certain groups are not present in PCL.
- It is possible that the overall lower incidence of PCL, greater disease burden, and poor prognosis across all groups may be contributing to these findings.
- With increasing evidence that PCL is a cytogenetically distinct entity from MM, more investigation into biologic and sociodemographic factors that affect healthcare utilization and treatment outcomes ought to be done.

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