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Real-World Characteristics, Step-Up Dosing Patterns, and Early Safety Outcomes in Black Patients With Multiple Myeloma Treated With Teclistamab

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Key Takeaway

In the real-world, although Black MM patients treated with teclistamab had higher baseline comorbidity burden than patients of other races, treatment patterns and tolerability were similar across patients of all races

Conclusions

In the first known real-world study using a nationally representative all-payer claims data to examine Black Americans with MM treated with teclistamab, a greater baseline comorbidity burden was observed among Black patients as compared to patients of other races

Patients in both cohorts were older than the patients in MajesTEC-1 trial

Prior treatment history, teclistamab treatment patterns, and tolerability of teclistamab appeared broadly similar between Black patients and patients of other races

Similar proportions of Black patients were treated with teclistamab as benchmarked to the general MM population in the ARMMRD registry, suggesting equitable access to teclistamab across races with medical insurance in the US. Further research is warranted to better understand the barriers to access

Introduction

- Multiple myeloma (MM) is twice as prevalent among Black Americans as in White Americans.[1] Compared to patients of European descent, Black patients with MM have a higher mortality rate[1-3]
- Prior evidence has demonstrated disparities in access to innovative therapies and underrepresentation of Black patients with MM in clinical trials[4]
- Teclistamab, a first-in-class B-cell maturation antigen (BCMA) x CD3 bispecific antibody, was approved for the treatment of relapsed or refractory MM through the pivotal MajesTEC-1 trial, which included 12.7% Black patients[5]
- In the real-world setting, approximately 14.7% of patients with newly diagnosed MM were Black, as reported in a cross-sectional analysis of the All-payer Real-world Multiple Myeloma Research-ready Data (ARMMRD) registry[4]

Objective

- To examine patient characteristics, step-up dosing (SUD) patterns, and early safety outcomes of Black patients with MM treated with teclistamab in the real-world, in order to understand access and outcomes in these patients

Methods

- We conducted a retrospective observational cohort study using de-identified data from the ARMMRD registry, derived from the STATinMED RWD Insights all-payer claims data (covering approximately 87% of the nationally insured population in the United States [US]) from January 1, 2014, to January 31, 2024 (the study period)
  - Claims data are used primarily for administrative/reimbursement purposes and are not intended for research. However, claims can provide valuable information on real world practice patterns
  - Although there are inherent limitations with claims such as potential coding errors or omissions, outcomes misclassification, and incomplete information which may cause under-reporting or over-estimation of co-morbidities and outcomes, prior studies have used real-world claims data for analyses of CRS outcomes where results should be interpreted with caution[6]

Study population

- Adult patients (≥18 years of age) with MM who had ≥1 teclistamab claim in the ARMMRD registry between October 26, 2022, and January 31, 2024 (the identification period) were included in this study (**Figure 1**)
- The index date was defined as the date of the earliest outpatient claim for a teclistamab 30 mg/3 mL vial or the admission date of the earliest hospitalization encounter claim that contained teclistamab
- Patients were required to have continuous eligibility for pharmacy and medical benefits for ≥6 months prior to the index date (pre-index period)
- Patients who received teclistamab before or on October 25, 2022 (teclistamab FDA approval date), were excluded

Cohort identification

- Patients who met the study criteria and had race information available were stratified into 2 cohorts: Black patients and patients of other races
- Patients in the ARMMRD registry who met the following criteria were considered to have a complete SUD period:
  - Had ≥1 inpatient admission containing teclistamab or ≥1 outpatient claim for a 30 mg/3 mL vial for teclistamab. The admission date of the first teclistamab claim (if inpatient) or the administration date of the first teclistamab claim (if outpatient) was defined as the start date of the SUD period
  - All inpatient or outpatient claims for teclistamab with a <5-day gap between claims within a 21-day continuous enrollment period from the SUD start date were rolled up as part of the SUD period. If an index claim was outpatient, an additional outpatient claim for a 153 mg/1.7 mL vial of teclistamab was required unless an inpatient admission containing teclistamab was observed
  - The end date of the SUD period was the discharge date if the last encounter was an inpatient admission, or the claim date +4 days if the last encounter was an outpatient claim for a 153 mg/1.7 mL vial

Data analysis

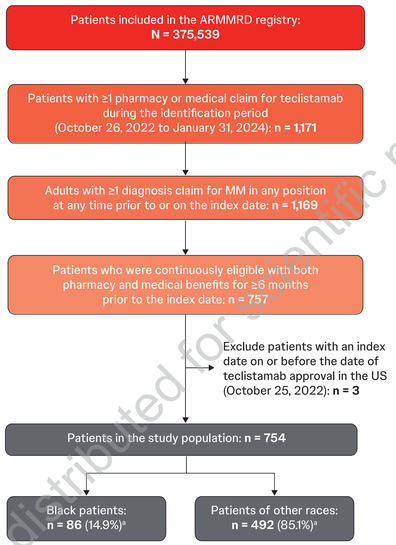
- Demographics and clinical characteristics were captured during the 6 months prior to or on the index date among all patients and analyzed descriptively
- Mean, standard deviation (SD), median, interquartile range (IQR), as well as minimum and maximum were reported for continuous variables; counts and percentages were reported for categorical variables
- Treatment history was captured using all available pre-index data among patients with ≥1 line of therapy (LOT) data available in the ARMMRD registry
- Health resource utilization (HRU) during the SUD period, cytokine release syndrome (CRS) rates, and dosing schedule for teclistamab were evaluated in patients with a complete SUD period
  - CRS was identified in 2 ways: (1) using the International Classification of Disease, 10th Revision, Clinical Modification (ICD-10-CM) codes and (2) using a published algorithm of CRS-related symptoms and treatment codes (Keating algorithm for CRS[6])

Results

Demographics

- Of the 754 patients who met the study criteria, 578 had race information available, including 86 (14.9%) Black patients and 492 (85.1%) patients of other races (**Figure 1**)
- Among patients of other races, the majority were White (95.7%) with the remaining being Asian (4.3%)
- Patient demographics are summarized in **Table 1**
- Although the median ages were similar, a higher proportion of Black patients were <65 years than patients of other races (38.4% vs 23.6%)
- In the real-world, Black patients and patients of other races were both much older compared to MajesTEC-1 trial patients; MajesTEC-1 median age was 64 years and 14.5% of patients were ≥75 years
- Compared to patients of other races, higher proportions of Black patients were from the Northeast (31.4% vs 18.5%) or the South (39.5% vs 28.9%) and covered by Medicaid (22.1% vs 7.9%)
- Conversely, lower proportions of Black patients than patients of other races were covered by Medicare Fee-For-Service (45.3% vs 67.5%) or a commercial health plan (10.5% vs 15.0%)
- Median duration of follow up was higher for Black patients than for patients of other races (4.7 months vs 3.8 months)

FIGURE 1: Study population



ARMMRD, All-payer Real-world Multiple Myeloma Research-ready Data; MM, multiple myeloma.
[a]Among patients with race information available (n = 578).

TABLE 1: Demographics of patients with MM treated with teclistamab

	Overall N = 754[a]	Black n = 86	Other races n = 492[b]
Median age (range), years	71 (31–85)	69 (47–84)	69 (31–85)
Age categories, years, n (%)			
<65	209 (27.7)	33 (38.4)	116 (23.6)
65 to 70	133 (17.6)	12 (14.0)	90 (18.3)
70 to 75	167 (22.1)	15 (17.4)	117 (23.8)
≥75	245 (32.5)	26 (30.2)	169 (34.3)
Sex, n (%)			
Male	388 (51.5)	38 (44.2)	254 (51.6)
Female	366 (48.5)	48 (55.8)	238 (48.4)
Race of patients with race information available, n (%)			
White	471 (81.5)	0 (0)	471 (95.7)
Black	86 (14.9)	86 (100)	0 (0)
Asian	21 (3.6)	0 (0)	21 (4.3)
Ethnicity of patients with ethnicity information available, n (%)			
Hispanic	78 (14.4)	11 (14.1)	67 (15.0)
Non-Hispanic	464 (85.6)	67 (85.9)	379 (85.0)
Region			
Northeast	149 (19.8)	27 (31.4)	91 (18.5)
Midwest	203 (26.9)	22 (25.6)	148 (30.1)
South	235 (31.2)	34 (39.5)	142 (28.9)
West	167 (22.1)	3 (3.5)	111 (22.6)
Payer type, n (%)			
Commercial	107 (14.2)	9 (10.5)	74 (15.0)
Medicaid	90 (11.9)	19 (22.1)	39 (7.9)
Medicare FFS	467 (61.9)	39 (45.3)	332 (67.5)
Medicare Advantage	89 (11.8)	19 (22.1)	46 (9.3)
Other insurance	1 (<1)	0 (0)	1 (<1)
Median follow up (range), months	4.6 (0–13.8)	4.7 (0–13.5)	3.8 (0–13.7)

FFS, Fee-For-Service; MM, multiple myeloma.
[a]Includes patients with missing information on race.
[b]Includes White and Asian patients.

Patient clinical characteristics

- Compared to patients of other races, Black patients had a higher mean Quan-Charlson Comorbidity Index (QCCI) score (4.9 vs 3.9) and higher prevalence of baseline comorbidities, including hypertension, anemia, and chronic pulmonary disease (**Table 2**)

Treatment history

- The proportion of patients with prior BCMA exposure was comparable between Black patients (16.1%) and patients of other races (15.8%; **Table 3**)
- A lower proportion of Black patients than patients of other races had received stem cell transplantation (SCT; 36% vs 46%; **Table 3**)

HRU during SUD

- Among 44 Black patients and 257 patients of other races with a complete SUD period, similar proportions of Black patients and patients of other races had ≥1 outpatient administration of teclistamab (20.5% and 21.4%, respectively) and comparable proportions of Black patients (97.7%) and patients of other races (94.2%) had ≥1 teclistamab-related hospitalization during the SUD period

TABLE 2: Baseline clinical characteristics of patients with MM treated with teclistamab

	Overall N = 754[a]	Black n = 86	Other races n = 492[b]
QCCI score			
Mean (range)	4.1 (0–17)	4.9 (0–14)	3.9 (0–16)
QCCI categorical scores, n (%)			
0	167 (22.1)	8 (9.3)	119 (24.2)
1	63 (8.4)	6 (7.0)	43 (8.7)
2	118 (15.6)	18 (20.9)	68 (13.8)
≥3	406 (53.8)	54 (62.8)	262 (53.3)
Key relevant comorbidities and conditions of interest, n (%)			
Hypertension	460 (61.0)	64 (74.4)	299 (60.8)
Anemia	439 (58.2)	62 (72.1)	283 (57.5)
Infections[c]	331 (43.9)	43 (50.0)	217 (44.1)
Renal impairment/failure[d]	318 (42.2)	42 (48.8)	203 (41.3)
Peripheral neuropathy	284 (37.7)	31 (36.0)	192 (39.0)
Hypogammaglobulinemia	203 (26.9)	15 (17.4)	141 (28.7)
Metastatic solid tumor	201 (26.7)	26 (30.2)	129 (26.2)
Any malignancy[e]	198 (26.3)	25 (29.1)	127 (25.8)
Lytic bone lesions	184 (24.4)	24 (27.9)	115 (23.4)
Congestive heart failure	166 (22.0)	24 (27.9)	107 (21.7)
Chronic pulmonary disease	150 (19.9)	25 (29.1)	93 (18.9)
Neutropenia	144 (19.1)	20 (23.3)	95 (19.3)
Osteoarthritis	139 (18.4)	22 (25.6)	82 (16.7)
Hypercalcemia	100 (13.3)	11 (12.8)	73 (14.8)
Lymphocytopenia	85 (11.3)	11 (12.8)	55 (11.2)
COPD	66 (8.8)	14 (16.3)	42 (8.5)
Extramedullary disease	31 (4.1)	4 (4.7)	19 (3.9)

COPD, chronic obstructive pulmonary disease; MM, multiple myeloma; QCCI, Quan-Charlson Comorbidity Index.
[a]Includes patients with missing information on race.
[b]Includes White and Asian patients.
[c]Includes COVID-19, pneumonia, upper respiratory tract infection (sinusitis), fungal infections, hepatitis B or C, C. difficile infection, bacteremia, pneumocystic jiroveci pneumonia, and tuberculosis.
[d]Includes all stage and unspecified chronic kidney disease, dialysis, end-stage renal disease, kidney transplant, and kidney failure.
[e]Includes lymphoma and leukemia but not malignant neoplasm of the skin.

TABLE 3: Treatment history of patients with MM treated with teclistamab

	Overall N = 263[a,b]	Black n = 37[a]	Other races n = 178[a,c]
Patients with prior LOT information available, n (%)	236 (89.7)	31 (83.8)	165 (92.7)
Prior BCMA-directed therapies, n (%)[d]	36 (15.3)	5 (16.1)	26 (15.8)
CAR-T therapy	19 (8.1)	3 (9.7)	14 (8.5)
Idecabtagene vicleucel	1 (<1)	1 (3.2)	0 (0)
Ciltacabtagene autoleucel	18 (7.6)	2 (6.5)	14 (8.5)
ADC (belantamab mafodotin)	21 (8.9)	3 (9.7)	15 (9.1)
Stem cell transplantation, n (%)[a]	98 (41.5)	11 (35.5)	75 (45.5)

ADC, antibody-drug conjugate; BCMA, B-cell maturation antigen; CAR-T, chimeric antigen receptor T cell; LOT, line of therapy; MM, multiple myeloma.
[a]Includes all patients who met the criteria for evaluation of treatment history.
[b]Includes all patients with missing information on race.
[c]Includes White and Asian patients.
[d]Among patients with prior LOT information available.

Real-world CRS during SUD

- During SUD, similar proportions of Black patients and patients of other races had ≥1 CRS event. Among patients who had ≥1 CRS event, most of the CRS events were grade 1 or 2 among both Black patients (88.9%) and patients of other races (85.1%; **Table 4**)

TABLE 4: CRS among patients who completed teclistamab SUD

	Overall N = 384[a]	Black n = 44	Other races n = 257[b]
rwCRS events per ICD-10 codes			
Patients with ≥1 CRS event, n (%)	150 (39.1)	18 (40.9)	94 (36.6)
Patients with grade 1 events, n (%)[c]	100 (26.0)	11 (25.0)	58 (22.6)
Patients with grade 2 events, n (%)[c]	29 (7.6)	5 (11.4)	22 (8.6)
Patients with grade ≥3 events, n (%)[c]	3 (<1)	1 (2.3)	2 (<1)
Patients with CRS grade unknown or unspecified, n (%)	18 (4.7)	1 (2.3)	12 (4.7)
rwCRS events per Keating classifications			
Patients with any grade CRS (loose definition)	128 (33.3)	18 (40.9)	74 (28.8)
Patients with mild CRS	100 (26.0)	15 (34.1)	59 (23.0)
Patients with severe CRS	28 (7.3)	3 (6.8)	15 (5.8)
Patients with specific rwCRS symptoms per Keating algorithm			
Fever	82 (21.4)	12 (27.3)	47 (18.3)
Fatigue	44 (11.5)	4 (9.1)	28 (10.9)
Hypotension	16 (4.2)	4 (9.1)	10 (3.9)
Hypoxia	4 (1.0)	0 (0)	3 (1.2)
Headaches	1 (<1)	0 (0)	1 (<1)

CRS, cytokine release syndrome; ICD-10, International Classification of Diseases, 10th Revision; rw, real-world; SUD, step-up dosing.
[a]Includes patients with missing information on race.
[b]Includes White and Asian patients.
[c]If there was more than 1 grade of CRS event, the event with the highest grade was counted.

Limitations

- This is a descriptive study. This study has small sample size for the Black cohort and limited follow-up in both cohorts. No statistical tests were conducted to compare differences between cohorts
- Proportions of patients with complete SUD could have been underestimated. The data from this study indicate that half of teclistamab patients are not able to complete SUD, which is not true per prior electronic healthcare record (EHR) and chart reviews in the literature[7]
- Data are primarily from US insured populations, which may not be generalizable to other populations
- Claims data may under- or over-estimate outcomes due to coding errors, misclassification, omissions, or incomplete information, and therefore, these results should be interpreted with caution
- ICANS events were not reported as ICD-10 codes were not developed until 2022 and there is a lack of algorithm to evaluate ICANS using claims data; both of these could lead to inaccurate estimation

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Poster

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Multiple Myeloma

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