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Healthcare Resource Utilization and Costs Following the Initiation of Various Lines of Therapy Among Patients With Relapsed/Refractory Multiple Myeloma

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Objectives

This study aimed to provide current estimates of the HCRU and costs associated with initiating various lines of therapy for patients with RRMM

Conclusions

- The results suggest significant HCRU and costs for patients with 2L+ RRMM, which often increases after initiating a new therapy
- The small sample sizes of patients initiating a CAR T-cell therapy prevented a meaningful interpretation, as a discordance between the changes of mean and median levels of HCRU and costs was observed

Background

- Although the treatment of multiple myeloma (MM) continues to evolve, many patients are exposed to or become refractory to existing treatment classes and require new lines of treatment[1,2]
- Consequently, patients with relapsed or refractory MM (RRMM) may incur significant healthcare resource utilization (HCRU) and costs as part of the management of their disease, particularly given the recent availability of chimeric antigen receptor (CAR) T-cell therapy and bispecific antibodies[3-5]

Methods

- We analyzed data from the Komodo Healthcare US claims and the COTA electronic health record (EHR) databases
- Patients with RRMM in the COTA EHR database were linked to their corresponding claims information in the Komodo dataset using an encrypted token to match patient records across both sources
- Adult (≥18 years) patients with MM who were triple-class exposed (TCE) and initiated their second line or later (2L+) treatment regimen (set as the index date) between 1 January 2019 and 2 May 2024 were included
- Patients were required to have closed-claims enrollment 180 days prior to their index date (pre-index period)
- Patients were also required to have at least 30 days of closed-claims enrollment and EHR observability after their index date (follow-up period)
- HCRU and costs (inpatient, outpatient, and pharmacy) on a per-patient per-month (PPPM) basis were reported
- Two additional a priori cohorts were identified:
  1. Patients initiating their fourth line (4L) or later treatment regimen
  2. Patients initiating a CAR T-cell therapy
- Analyses focused on describing the changes in HCRU and costs from the pre-index period to the follow-up period for each cohort

Results

PATIENTS AND TREATMENT

- 143 2L+ RRMM patients were included in this analysis (**Table 1**)
- 2.8% of patients were initiating their second line (2L) therapy at index; 40.6%, 28.7%, and 28.0% were initiating their third line (3L), 4L, and fifth line (5L) or later regimens, respectively
- Median follow-up was 4.5 months (range, 0.2-46.8)

Table 1. Baseline and treatment characteristics

	N=143
Age on index date, mean (SD), years	63.6 (11.0)
Sex, n (%)	
Female	85 (59.4)
Male	58 (40.6)
Race / Ethnicity, n (%)	
Asian or Pacific Islander	3 (2.1)
Black or African American	18 (12.6)
Hispanic or Latino	0 (0)
White	93 (65.0)
Other	8 (5.6)
Unknown or missing	21 (14.7)
Region on index date, n (%)	
South	103 (72.0)
Northeast	39 (27.3)
West	1 (0.7)
Midwest	0 (0)
Index line of therapy, n (%)	
2L	4 (2.8)
3L	58 (40.6)
4L	41 (28.7)
5L+	40 (28.0)
Time from initial MM diagnosis to index date, median (IQR), months	34.2 (18.5-53.6)
Modified CCI score,[a] mean (SD)	0.08 (0.29)
Medical insurance type, n (%)	
Commercial	74 (51.7)
Medicare	59 (41.3)
Medicaid	10 (7.0)
Pharmacy insurance type, n (%)	
Commercial	74 (51.7)
Medicare	57 (39.9)
Medicaid	8 (5.6)
Missing	4 (2.8)

[a] Assessed from 180 days prior to the index date to one day prior to the index date
2L=second line; 3L=third line; 4L=fourth line; 5L+=fifth line or later; CCI=Charlson Comorbidity Index; IQR=interquartile range; SD=standard deviation

HEALTHCARE RESOURCE UTILIZATION

2L+ TCE Patients (N=143)

- Mean number of all-cause inpatient and outpatient visits increased from the pre-index (0.08 PPPM and 3.79 PPPM, respectively) to the follow-up period (0.23 PPPM and 4.79 PPPM; **Table 2**)
  - Median values also increased or remained the same
- Both the total mean and median all-cause medical and pharmacy costs PPPM increased from the pre-index ($23,143 and $19,137, respectively) to the follow-up period ($31,583 and $25,343; **Figure 1**)

4L+ TCE patients (n=107)

- Among 4L+ TCE patients, the pattern was similar
- Mean number of all-cause inpatient and outpatient visits increased from the pre-index (0.09 PPPM and 3.74 PPPM, respectively) to the follow-up period (0.21 PPPM and 4.53 PPPM; **Table 2**)
- Median number of inpatient visits was zero for both the pre-index and follow-up periods
- Mean PPPM costs increased from pre-index to the follow-up period ($23,452 to $28,398, respectively), whereas the median costs increased by a smaller margin ($20,640 to $22,387; **Figure 1**)

Patients initiating 2L+ CAR T-cell therapy (n=11)

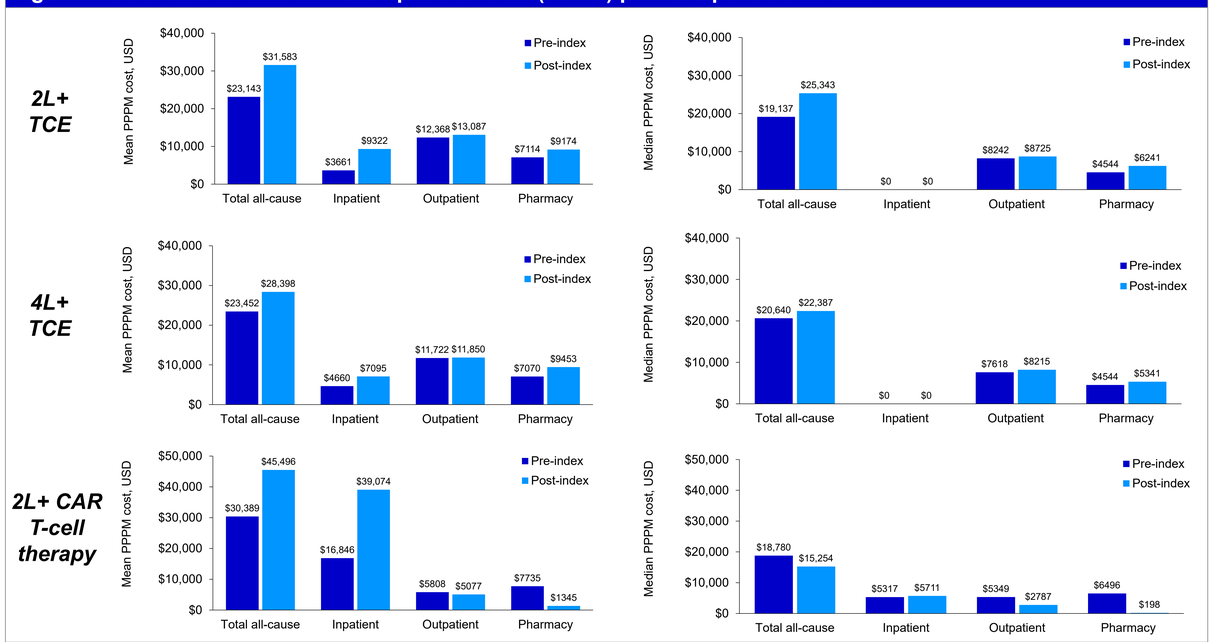
- 11 patients with 2L+ RRMM initiated CAR T-cell therapy
- Mean number of inpatient visits increased (0.21 to 0.24 PPPM), and the median number of inpatient visits remained similar (0.17 to 0.16 PPPM; **Table 2**)
- Median number of outpatient visits and mean total costs increased from the pre-index (2.67 and $30,389 PPPM, respectively) to the follow-up period (3.46 and $45,496; **Table 2** and **Figure 1**)
- Mean number of outpatient visits and median total costs both decreased from pre-index to follow-up period (3.61 to 3.39 and $18,780 to $15,254, respectively; **Table 2** and **Figure 1**)

Table 2. All-cause inpatient and outpatient visits PPPM by relapsed/refractory subgroup

	2L+ TCE[a] (N=143)		4L+ TCE[a] (n=107)		2L+ CAR T-cell therapy (n=11)	
	Pre-index	Post-index	Pre-index	Post-index	Pre-index	Post-index
All-cause inpatient visits PPPM						
Mean (SD)	0.08 (0.15)	0.23 (0.59)	0.09 (0.17)	0.21 (0.52)	0.21 (0.25)	0.24 (0.30)
Median (IQR)	0.00 (0.00, 0.17)	0.00 (0.00, 0.25)	0.00 (0.00, 0.17)	0.00 (0.00, 0.25)	0.17 (0.00, 0.42)	0.16 (0.00, 0.27)
All-cause outpatient visits PPPM						
Mean (SD)	3.79 (3.55)	4.79 (3.95)	3.74 (2.91)	4.53 (3.83)	3.61 (2.45)	3.39 (2.19)
Median (IQR)	3.00 (1.83, 4.92)	3.80 (2.43, 6.03)	3.00 (1.92, 4.50)	3.57 (1.96, 5.70)	2.67 (1.92, 4.67)	3.46 (1.84, 4.45)

[a]TCE is defined as having prior exposure to at least one anti-CD38, immunomodulatory drug, and PI treatment
2L+=second line or later; 4L+=fourth line or later; CAR=chimeric antigen receptor; IQR=interquartile range; PI=proteasome inhibitor; PPPM=per-patient per-month; SD=standard deviation; TCE=triple-class exposed

Figure 1. Mean and median all-cause patient costs (PPPM) pre- and post-index date[a-d]



[a]Inpatient represents any observations in the inpatient table or observations in the non-inpatient table with an inpatient place of service linked through the visit ID; [b]Outpatient represents any observation in the non-inpatient table with an outpatient place of service without a linked visit ID in the inpatient table; [c]Total HCRU assessed as the total number of pharmacy claims, inpatient visits, and outpatient visits during the assessment period; [d]Follow-up period was assessed from the index line of therapy date and censored on next treatment, death, end of study period (1 June 2024), or end of continuous enrollment/observability
2L+=second line or later; 4L+=fourth line or later; CAR=chimeric antigen receptor; HCRU=healthcare resource utilization; PPPM=per-patient per-month; TCE=triple-class exposed

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