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902.HEALTH SERVICES AND QUALITY IMPROVEMENT - LYMPHOID MALIGNANCIES

Health Care Resource Utilization (HCRU) and Cost of Management of Cytokine Release Syndrome (CRS) and Neurological Events (NEs) in Patients with R/R Follicular Lymphoma (FL) Receiving Lisocabtagene Maraleucel (liso-cel) in the TRANSCEND FL Study

Ashley C. Saunders[1], *Tavneet Singh*[2], *Abraham Lee*[2], *Thalia Farazi*[3], *Omotayo Fasan*[1], *Sana Mirza*[2], *November McGarvey*[2]

[1] Bristol Myers Squibb, Princeton, NJ
[2] BluePath Solutions, Los Angeles, CA
[3] Bristol Myers Squibb, San Francisco, CA

Background: Adverse events (AEs) such as CRS and NEs of varying severity have been associated with CAR T cell therapies, including liso-cel, an autologous, CD19-directed, 4-1BB CAR T cell product administered at equal target doses of $CD8^+$ and $CD4^+$ CAR^+ T cells. Liso-cel has previously demonstrated clinically meaningful responses in patients with R/R FL in the phase 2 TRANSCEND FL study (NCT04245839). In addition, previous research among patients with large B-cell lymphoma has suggested an acceptable safety profile with few grade $\geq$ 3 CRS/NEs, and safety data from TRANSCEND FL are in line with this larger dataset. However, there is limited to no research published on estimates of HCRU and costs related to the management of CRS/NEs among liso-cel-treated patients with FL. This analysis evaluated HCRU and estimated costs of managing CRS/NEs by grade and concurrency for patients with R/R FL who received liso-cel treatment in the TRANSCEND FL study.
Methods: Retrospective analyses were conducted for liso-cel-treated patients with R/R FL (second line or later) who experienced CRS/NEs within 90 days after infusion using patient-level HCRU data from the TRANSCEND FL study databases. HCRU captured included facility (standard inpatient [IP] and ICU hospitalizations), length of stay (LOS), diagnostics (eg, laboratory and imaging), procedures (eg, dialysis and mechanical ventilation), and medications (eg, oncology supportive care, prophylactics, and other AE management). Costs of managing CRS/NEs were estimated using a microcosting methodology in which 1) HCRU from the time of AE onset through resolution was identified and 2) the most recently available unit costs sourced from public databases or literature (US Centers for Medicare and Medicaid Services, Healthcare Cost and Utilization Project, and IBM ® Micromedex ® RED BOOK ®) were applied to each HCRU and adjusted to 2023 US dollars using the Consumer Price Index. Analyses were stratified by AE grade and concurrency of events (CRS or NEs only, nonconcurrent CRS and NEs, and concurrent CRS and NEs). Patients with nonconcurrent and concurrent CRS/NEs were categorized by the highest-grade event experienced.
Results: CRS only occurred in 59/130 (45%) patients, NEs only occurred in 4/130 (3%), and CRS and/or NEs occurred in 79/130 (61%). Of the 79 patients who experienced CRS and/or NEs, 75 (95%) were grade $\leq$ 2 and 4 (5%) were grade 3; no grade 4 or 5 CRS/NEs were observed. Most CRS/NEs were experienced as a single event (63/79 [80%]). Patients who experienced CRS and/or NEs had a median (range) age of 60 (23–78) years and were predominantly male (51/79 [65%]). Estimated median management costs ranged from $20,306 (grade 1 CRS only) to $50,400 (grade 3 CRS or NEs; Figure). The largest contributor to median management costs across CRS/NE categories was facility HCRU. Key HCRU and total LOS (standard IP hospitalization and ICU stay days among hospitalized patients) are shown in the Table. Almost all patients (78/79 [99%]) had a standard IP hospitalization, and only 1 patient (1%) with a grade 3 CRS only event was admitted to the ICU. Median (range) total LOS for IP/ICU admission was 1.5 days longer among patients with grade 3 versus grade $\leq$ 2 CRS and/or NEs (5.5 [3–8] days vs 4 [1–14] days). Although there were very few grade 3 events (n = 4) to assess, patients with grade 3 versus grade $\leq$ 2 CRS and/or NEs also had higher rates of utilization for some medications (eg, tocilizumab: 3/4 [75%] vs 28/75 [37%]; corticosteroids: 4/4 [100%] vs 19/75 [25%]).
Conclusions: While most patients with R/R FL treated with liso-cel in the TRANSCEND FL study experienced treatment-emergent CRS and/or NEs, they were almost all of low severity (grade $\leq$ 2) and experienced as single events. Management costs for CRS/NEs, primarily related to facility HCRU, increased with greater AE severity and concurrency. The additional median cost for a patient with grade 3 versus grade $\leq$ 2 CRS or NEs was $22,586, representing an 88% increase in cost; however, this finding must be considered in the context of the small number of overall grade 3 events (n = 4) and ICU admissions (n

= 1). CAR T cell therapies with few associated higher severity AEs provide a potential option to optimize resource use and costs for the management of CRS/NEs in patients with FL.

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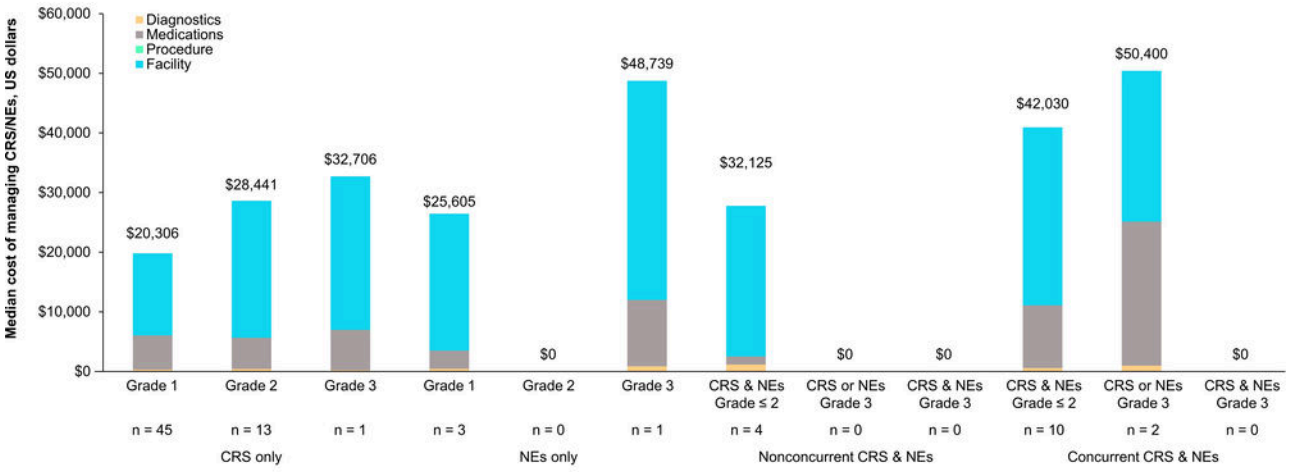
Figure. Median cost of managing CRS/NEs (n = 79)



Lee criteria (Lee DW, et al. *Blood* 2014) were used to determine CRS, while the National Cancer Institute Common Terminology Criteria for Adverse Events, version 5.0, was used to determine NEs. Median values are presented and rounded to the nearest whole number. Results represent the median cost per patient experiencing an event of CRS or NEs. Median total costs may not equal the sum of the component categories as the cost shown in each category reflects the median applicable to that category.

Table. Key HCRU and LOS (n = 79)

	All CRS &/or NEs		CRS only			NEs only		Nonconcurrent CRS & NEs	Concurrent CRS & NEs	
AE grade	**CRS &/or NEs ≤ 2**	**CRS &/or NEs 3**	**1**	**2**	**3**	**1**	**3**	**CRS & NEs ≤ 2**	**CRS & NEs ≤ 2**	**CRS or NEs 3**
Patients, n (%)[a]	75 (94.9)	4 (5.1)	45 (57.0)	13 (16.5)	1 (1.3)	3 (3.8)	1 (1.3)	4 (5.1)	10 (12.7)	2 (2.5)
Number of events[b]	89	6	45	13	1	3	1	8	20	4
Facility, n (%)[c]										
Standard IP	75 (100)	3 (75.0)	45 (100)	13 (100)	0	3 (100)	1 (100)	4 (100)	10 (100)	2 (100)
ICU	0	1 (25.0)	0	0	1 (100)	0	0	0	0	0
Total LOS, days										
Mean (SD)	4.1 (2.7)	5.5 (2.1)	3.2 (2.0)	4.8 (2.3)	3 (0)	4.7 (1.5)	8 (0)	5.8 (1.7)	6.8 (3.8)	5.5 (0.7)
Median (range)	4 (1–14)	5.5 (3–8)	3 (1–9)	5 (1–10)	3 (3–3)	5 (3–6)	8 (8–8)	5.5 (4–8)	6.5 (2–14)	5.5 (5–6)
Medication, n (%)[c]										
Any tocilizumab	28 (37.3)	3 (75.0)	12 (26.7)	8 (61.5)	1 (100)	0	0	1 (25.0)	7 (70.0)	2 (100)
Any corticosteroids	19 (25.3)	4 (100)	6 (13.3)	5 (38.5)	1 (100)	1 (33.3)	1 (100)	0	7 (70.0)	2 (100)
Tocilizumab + corticosteroids	16 (21.3)	3 (75.0)	4 (8.9)	5 (38.5)	1 (100)	0	0	0	7 (70.0)	2 (100)
Antibiotics	71 (94.7)	4 (100)	43 (95.6)	13 (100)	1 (100)	2 (66.7)	1 (100)	4 (100)	9 (90.0)	2 (100)
Vasopressors	1 (1.3)	1 (25.0)	0	1 (7.7)	1 (100)	0	0	0	0	0
Diagnostic, n (%)[c]										
Imaging	13 (17.3)	0	7 (15.6)	1 (7.7)	0	0	0	1 (25.0)	4 (40.0)	0
Laboratory	70 (93.3)	2 (50.0)	41 (91.1)	13 (100)	0	3 (100)	0	4 (100)	9 (90.0)	2 (100)
Biopsy	0	1 (25.0)	0	0	0	0	0	0	0	1 (50.0)
Procedure, n (%)[c]										
Dialysis	0	0	0	0	0	0	0	0	0	0
Mechanical ventilation	1 (1.3)	0	0	1 (7.7)	0	0	0	0	0	0

Lee criteria (Lee DW, et al. *Blood* 2014) were used to determine CRS, while the National Cancer Institute Common Terminology Criteria for Adverse Events, version 5.0, was used to determine NEs. Only key HCRU metrics are displayed in the table and do not reflect all HCRU metrics assessed. LOS calculations were limited to days during the AE and included standard IP and ICU days; blanks were assumed to be 0. AE categories with no patients were not displayed. Hospitalizations that were not related to CRS or NEs were not included.
[a]Percentages calculated using n = 79 (patients with an event of CRS or NEs) as the denominator; [b]Some patients had multiple events of CRS or NEs; [c]Percentages calculated within row as percentage of AE type and grade.

Figure 1

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