The Patient Journey and Treatment Outcomes Comparing Inpatient Versus Outpatient Axicabtagene Ciloleucel in Non-Hodgkin's Lymphoma - a Large, Multicenter Study

Minoo Battiwalla[1], Shanna Arnold Egloff[2], Betsy Blunk[1], Casey Martin[3], Meredith Mattlin[3], Katie Culos[4], Hil Hsu[4], Timothy Best[4], Nosha Farhadfar[1], Michael Tees[1], Uttam Rao[1], John Mathews[1], Priya Amin[2], Rocky Billups[1], Tonya Cox[1], and Navneet Majhail[1]

[1] Sarah Cannon Transplant and Cellular Therapy Network, HCA Healthcare, [2] HCA Healthcare Research Institute, HCA Healthcare, Brentwood, TN 37027, [3] Genospace, Inc., [4] Kite, a Gilead Company, Santa Monica, CA 90404

BACKGROUND & METHODS

- Patient journeys and outcomes were evaluated for those receiving axicabtagene ciloleucel (axi-cel), an FDA-approved anti-CD19+ chimeric antigen receptor T-cell (CAR T) therapy for non-Hodgkin lymphoma (NHL) across a community-based transplant and cell therapy network across 5 centers.
- 167 axi-cel recipients were identified in the study period (2019-2023) with 63% of infusions occurring in 2022 and 2023
- Axi-cel was infused either inpatient (IP) or in the outpatient setting (OP) supported by remote patient monitoring.[1]

RESULTS

- Diffuse large B-cell lymphoma (DLBCL) accounted for 143 (86%) of the NHL axi-cel-treated cohort and Follicular accounted for 24 (14%). Results focus on DLBCL.
- Axi-cel was predominantly delivered as 2L-3L in DLBCL (~70%) and, 2L-5L for follicular exclusive of holding/bridging therapy (Table 1 and Figure 2)
- Of DLBCL, 47 (34%) were OP; OP comprised 43% and 62% of axi-cel treatment in 2022 and 2023, respectively (Figure 1)
- OP and IP showed similar time from referral to infusion (111 vs. 95 days, p=0.10)
- Bendamustine was infused in 57% of OP and 7% of IP, whereas Flu/cy was infused in 43% of OP and 71% of IP (Table 1)
- DLBCL cohort showed a CRS incidence of 85% (11% Grade 3+) and ICANS incidence of 49% (18% Grade 3+); corresponding use of tocilizumab for CRS was 66%, and anakinra for steroid refractory ICANS was 4.9% (Table 2)
- At least one dose of prophylactic dexamethasone was administered more frequently in the OP vs. IP (89% vs. 17%); (Table 1) but did not delay onset of CRS (4 vs. 4 days, p=0.2) or ICANS (6 vs. 5 days, p=0.2)
- Median cumulative reactive dexamethasone dose in OP was less than 50% of that in IP (70 vs. 207 mg; Table 2)
- Six (13%) OP patients avoided subsequent hospitalization and OP had similar ICU rates (28% vs. 23%) as IP (Table 2)
- Median length of stay (LOS) for OP was 8 days compared to 15 days for IP (p<0.001), with no difference in median ICU LOS for those admitted to ICU (8 vs. 5 days, p=0.3) (Table 2)
- Complete or partial response at 30 days was achieved in 76% and 70% of OP and IP cases, respectively (Table 2)
- Median follow-up for the overall DLBCL, OP, and IP cohorts was 419, 383, and 461 days, respectively
- Median progression-free survival of OP was significantly better than IP (not reached vs. 365 days, p=0.033; Figure 3A)
- No difference in median overall survival for OP compared to IP (not reached vs. 723 days, p=0.49; Figure 3B)
- Socioeconomic factors and clinicodemographics such as sex, race, ethnicity, age, BMI, smoking status and pack years, primary language, marital status, comorbidity index, performance status, and prior autologous transplant were similar between IP and OP (Table 1)
- OP was not inferior to IP in regards to providing access to axi-cel, including distance to treatment facility, national and state area deprivation indices, and insurance coverage (Table 1)

CONCLUSIONS

Despite having similar baseline characteristics, OP supported by RPM maintained access to axi-cel therapy, reduced healthcare utilization by reducing overall hospitalization rates/ duration, reactive steroid exposure, and showed outcomes that were comparable to those in IP.

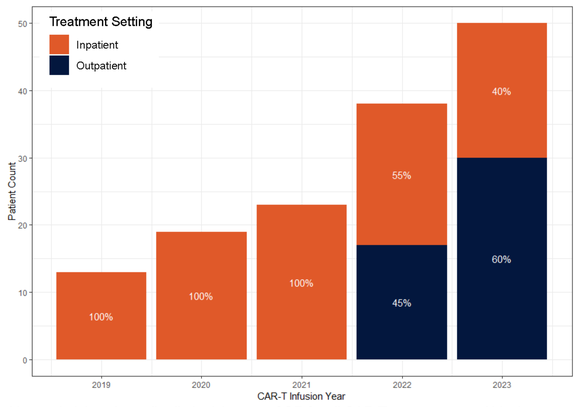
1 *Comparison of 15- Vs. 30-Day Remote Patient Monitoring for Outpatient Chimeric Antigen Receptor T-Cell Therapy (CAR-T) across a Large Health System.* See ASH 2024 Publication #2300

RESULTS

Table 1. DLBCL CAR T Cohort: Clinicodemographics

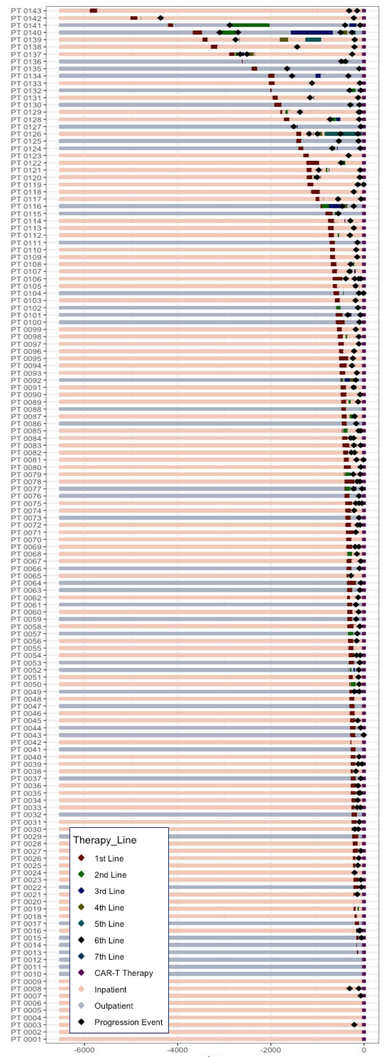
Characteristic	DLBCL N = 143 N (%)		
	DLBCL Overall N = 143	Inpatient N = 96	Outpatient N = 47
Gender			
Male	83 (58%)	54 (56%)	29 (62%)
Age			
Median, (IQR)	61, (53, 70)	60, (52, 66)	65, (56, 71)
Range	24, 80	24, 78	25, 80
Race			
White	103 (72%)	70 (73%)	33 (70%)
Black	4 (2.8%)	2 (2.1%)	2 (4.3%)
Asian	10 (7.0%)	7 (7.3%)	3 (6.4%)
Other	24 (17%)	15 (16%)	9 (19%)
Not reported	2 (1.4%)	2 (2.1%)	0 (0%)
Ethnicity			
Hispanic/Latino	24 (17%)	15 (16%)	9 (19%)
Not Hispanic/Latino	97 (68%)	72 (75%)	25 (53%)
Decline to Specify	1 (0.7%)	0 (0%)	1 (2.1%)
Not reported	21 (15%)	9 (9.4%)	12 (26%)
BMI			
Median, (IQR)	27.3, (23.0, 31.3)	27.3, (23.1, 31.9)	27.3, (22.8, 29.9)
Missing	5 (3.5%)	5 (5.2%)	0 (0%)
Smoking Status			
Current every day smoker	2 (1.4%)	2 (2.1%)	0 (0%)
Former smoker	41 (29%)	26 (27%)	15 (32%)
Never smoker	76 (53%)	47 (49%)	29 (62%)
Not reported	24 (17%)	21 (22%)	3 (6.4%)
Facility Distance (km)			
Median, (IQR)	35, (18, 108)	33, (18, 70)	42, (19, 276)
Missing	24 (17%)	17 (18%)	7 (15%)
Range	2, 1,032	2, 1,032	6, 568
Insurance Coverage			
Commercial Insurance	81 (57%)	64 (67%)	17 (36%)
Medicaid	9 (6.3%)	3 (3.1%)	6 (13%)
Medicare	29 (20%)	11 (11%)	18 (38%)
Missing	22 (15%)	18 (19%)	4 (8.5%)
Other (VA,Tricare)	2 (1.4%)	0 (0%)	2 (4.3%)
ADI National Rank			
Median, (IQR)	38, (26, 53)	37, (26, 52)	42, (28, 59)
Missing	25 (17%)	18 (19%)	7 (15%)
ADI State Rank			
Median, (IQR)	4, (2, 7)	3, (2, 6)	4, (3, 7)
Missing	25 (17%)	18 (19%)	7 (15%)
Comorbidity Index			
0	45 (31%)	29 (30%)	16 (34%)
1	32 (22%)	16 (17%)	16 (34%)
2	22 (15%)	17 (18%)	5 (11%)
3	15 (10%)	11 (11%)	4 (8.5%)
4	12 (8.4%)	8 (8.3%)	4 (8.5%)
≥ 5	17 (11.8%)	15(15.6%)	2 (4.3%)
Performance Score			
70-80	55 (38.4%)	40 (41.6%)	15 (32%)
90-100	78 (54.5%)	46 (47.9%)	32 (68.1%)
Not documented	10 (7.0%)	10 (10.4%)	0 (0%)
Prior Auto Transplant			
Yes	16 (11%)	11 (11%)	5 (11%)
Not documented	127 (89%)	85 (89%)	42 (89%)
CAR-T Line of Therapy			
2L	58 (41%)	36 (38%)	22 (46%)
3L	38 (27%)	32 (34%)	6 (12%)
4L	28 (20%)	15 (16%)	13 (27%)
5L	7 (4.9%)	4 (4.2%)	3 (6.2%)
6L	3 (2.1%)	2 (2.1%)	1 (2.1%)
7L	0 (0%)	0 (0%)	0 (0%)
8L	1 (0.7%)	1 (1.05%)	0 (0%)
Missing	8 (5.6%)	6 (6.2%)	2 (4.3%)
Preparative Regimen			
Bendamustine	34 (24%)	7 (7.3%)	27 (57%)
Flu/Cy	88 (62%)	68 (71%)	20 (43%)
Missing	21 (15%)	21 (22%)	0 (0%)
Dexamethasone at Day 0	58 (41%)	16 (17%)	42 (89%)
Dexamethasone at Day 1	44 (31%)	19 (20%)	25 (53%)
Dexamethasone at Day 2	43 (30%)	19 (20%)	24 (51%)

Figure 1. DLBCL CAR T Outpatient Treatment over Time



Note: administrative policy limited the use of OP for all CAR T at one center within the network

Figure 2. DLBCL CAR T Cohort: Lines of Therapy Journey



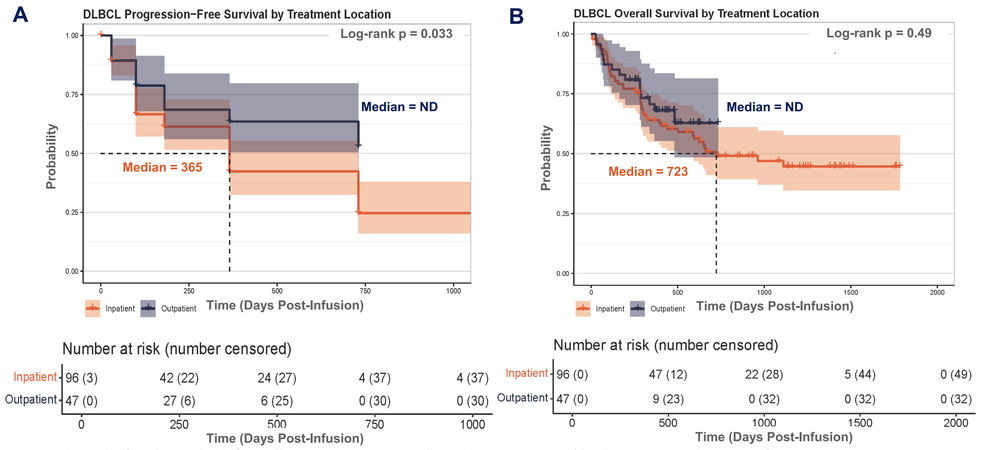
Swimmer plot indexed at CAR T infusion and ordered by duration in time (days) between start of 1L treatment and CAR T infusion.

Table 2. DLBCL CAR T Cohort: Outcomes

Characteristics	DLBCL N = 143 N (%)		
	DLBCL Overall N = 143	Inpatient N = 96	Outpatient N = 47
CRS Max Grade			
Grade 1	55 (38%)	38 (40%)	17 (36%)
Grade 2	50 (35%)	31 (32%)	19 (40%)
Grade 3	7 (4.9%)	6 (6.2%)	1 (2.1%)
Grade 4	9 (6.3%)	7 (7.3%)	2 (4.3%)
No CRS	22 (15%)	14 (15%)	8 (17%)
ICANS Max Grade			
Grade 1	30 (21%)	22 (23%)	8 (17%)
Grade 2	14 (9.8%)	9 (9.4%)	5 (11%)
Grade 3	26 (18%)	23 (24%)	3 (6.4%)
No ICANS	73 (51%)	42 (44%)	31 (66%)
Total Reactive Dex Equivalent			
Median (mg), (IQR)	142, (60, 299)	**207, (104, 308)**	**70, (30, 248)**
None Indicated (%)	80 (56%)	60 (62%)	20 (43%)
Received Tocilizumab			
Yes	94 (66%)	59 (61%)	35 (74%)
No	26 (18%)	14 (15%)	12 (26%)
Missing	23 (16%)	23 (24%)	0 (0%)
Received Anakinra			
Yes	7 (4.9%)	3 (3.1%)	4 (8.5%)
No	113 (79%)	70 (73%)	43 (91%)
Missing	23 (16%)	23 (24%)	0 (0%)
Ever Inpatient	137 (96%)	**96 (100%)**	**41 (87%)**
Inpatient Treatment (days)			
Median Inpatient LOS, (IQR)	13, (9, 18)	**15, (11, 21)**	**8, (4, 12)**
Not Applicable (%)	7 (4.9)	0 (0)	7 (15)
Range	1, 97	1, 97	2, 27
Ever In ICU	35 (24%)	22 (23%)	13 (28%)
ICU Treatment (days)			
Median ICU LOS, (IQR)	8, (2, 12)	5, (2, 10)	8, (4, 12)
Not Applicable (%)	108 (76)	74 (77)	34 (72)
Range	1, 53	1, 53	1, 16
Disease Status 30 Day			
Complete Response (CR)	52 (36%)	31 (32%)	21 (45%)
Partial Response (PR)	27 (19%)	14 (15%)	13 (28%)
Mixed Response	1 (0.7%)	0 (0%)	1 (2.1%)
Stable Disease	15 (10%)	9 (9.4%)	6 (13%)
Relapse/Progression	14 (9.8%)	10 (10%)	4 (8.5%)
Not Assessed	29 (20%)	29 (30%)	0 (0%)
Not Evaluable	2 (1.4%)	1 (1.0%)	1 (2.1%)
Missing	3 (2.1%)	2 (2.1%)	1 (2.1%)
CR/PR 30 Day			
Yes CR/PR	79 (72%)	45 (70%)	34 (76%)
No CR/PR	30 (28%)	19 (30%)	11 (24%)
Death	62 (43%)	47 (49%)	15 (32%)

Note: In the DLBCL cohort, no patients received ruxolitinib or siltuximab. Bolded results highlight appreciable reduction in OP compared to IP.

Figure 3. DLBCL CAR T Cohort: Progression-Free and Overall Survival Curves



Note: PFS includes death from all causes as an event, along with progression (death is not treated as censor).

We, at HCA Healthcare Research Institute, exist to unlock insights into real-world data and to conduct clinical studies that lead to breakthroughs in science, medicine and care for all people.

Disclosures: The views expressed in this publication represent those of the author(s). None of the authors declare any conflict of interest related to the current study beyond employment by HCA Healthcare and/or Kite.
This study was funded, in whole, by Kite. Analysis was performed by teams within or affiliated with HCA Healthcare including the Sarah Cannon Cancer Network, the HCA Healthcare Research Institute and Genospace.

HCA Healthcare® Sarah Cannon Cancer Network

GENOSPACE