Third Line (3L) CAR T-Cell Therapy in the Golden Years: A Single-Center experience on Outcomes for Elderly Patients in Large B-cell lymphoma

Majed Altareb[1], K. Hueniken[3], T. Aoki[1,2], C. Chen[1,2], M. Crump[1,2], R. Kridel[1,2], V. Kukreti[1,2], J. Kuruvilla[1,2], A. Price[1,2], A. Vijenthira[1,2], C. Yang[1,2], S. Bhella[1,2]

[1]Division of Medical Oncology and Hematology, Princess Margaret Hospital, Toronto, Canada;
[2]Department of Medicine, University of Toronto, Toronto, Canada;
[3]Department of Biostatistics, Princess Margaret Cancer Centre, Toronto, Canada

Introduction

The treatment of elderly DLBCL patients is often complicated by co-morbidities, poor performance status, and higher-risk disease characteristics. We sought to examine the outcomes and toxicity of 3L CAR T-cell therapy for elderly patients at our centre.

Methods

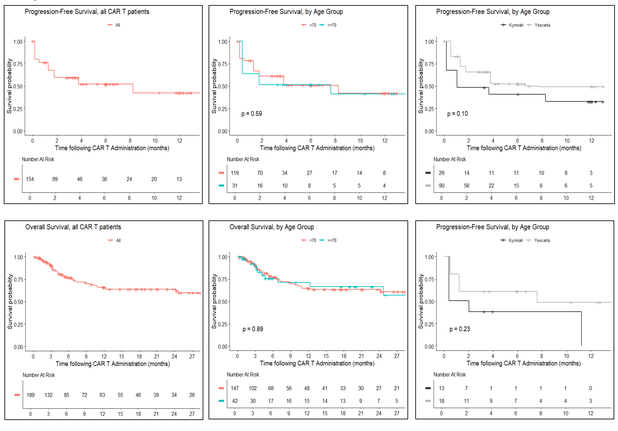
A retrospective analysis was performed on patients who received 3L CAR T-cell therapy for DLBCL at Princess Margaret Cancer Centre in Toronto between June 2020 and April 2024. Patients were categorized into two cohorts: those aged ≥70 years and those aged <70 years.

Results

A total of 189 patients received CAR T-cell therapy during this period, with 42 (22.2%) aged ≥70 years and 147 aged <70 years. During this period, 56 pts were referred for CAR T-cell therapy and were not infused, 41 were <70 and 15 were ≥70 years (p=0.60). Median age of the infused patients was 61 years (range 19–83), with 62% male. Among patients aged ≥70 years who were infused, median hematopoietic cell transplant comorbidity index (HCT-CI) was 1, median ECOG performance status was 1, and median Karnofsky performance status (KPS) was 80%. Of the infused patients, 5 were ≥80 years.

Intake appointment to infusion for pts <70 was a median of 51 days and those ≥70 years was a median of 54 days (p=0.312). There were no significant differences in use of bridging therapy by age (p=0.87). There was no significant difference between response at day 100 post CAR T-cell infusion between pts <70 and ≥70 years (p=0.17). Inpatient length of stay was a median of 12 days for <70 and 13 days for ≥70 years (p=0.27).

Graphs. OS & PFS:



Results

With a median follow-up of 12 months, OS and PFS rates were comparable across age groups. The 12-month OS was 71.1% for patients aged ≥70 years and 64.6% for those aged <70 years. The 12-month PFS rates were 41.3% and 42.0%, respectively. Median PFS was 8.21 months in the ≥70 group compared to 15.21 months in the <70 group, while median OS was 24.77 months and 15.21 months, respectively.

Our center preferentially considered Tisagenlecleucel (TisaCel) for older patients with significant comorbidities. 16 (38%) of the ≥70 group received TisaCel. Outcomes, including OS and PFS, showed no significant differences between TisaCel and AxiCel.

Toxicity profiles were similar regardless of age or CAR T-cell product used. Cytokine release syndrome (CRS) occurred in 89% of patients (p=0.63), with severe CRS (≥ grade 3) in 0-1% of both age groups (p=1). Rates of immune effector cell-associated neurotoxicity syndrome (ICANS) (p=0.13) and Grade 3+ ICANS (p=1) also showed no significant age-related differences.

By the last follow-up, disease progression remained the primary cause of death, with 39 patients (26.5%) aged <70 and 5 patients (11.9%) aged ≥70 deceased.

Table. Safety and toxicities of CAR-T therapy by age groups:

Variables	All Patients (n=189)	<70 (n=147)	>=70 (n=42)	P-value
CRS	165 (87)	130 (88)	35 (83)	0.63
GRADE >3 CRS	4 (2)	3 (2)	1 (2)	1.00
ICANS	53 (28)	36 (24)	17 (40)	0.13
GRADE >3 ICANS	7 (4)	5 (4)	2 (5)	1.00
Tocilizumab Treatment	132 (70)	102 (70)	30 (72)	0.92
Steroids Treatment	61 (32)	49 (33)	12 (29)	0.66
ICU Admission	13 (7)	10 (7)	3 (7)	1.00
ICU Support - Inotropes	3 (2)	3 (2)	0 (0)	0.70
ICU length of stay Mean (sd)	2.5 (3.0)	2.7 (3.1)	1.7 (2.9)	0.59
Median (Min, Max)	2 (0, 8)	2 (0, 8)	0 (0, 5)	
Causes of Death				
Progression-related death	29 (63)	25 (61)	4 (80)	0.36
Infections	6 (13)	5 (12)	1 (20)	
CAR T-cell complications	1 (2)	1 (2)	0 (0)	
Unknown causes	10 (22)	10 (25)	0 (0)	

Conclusion

CAR T-cell therapy shows similar OS, PFS, and toxicity outcomes in DLBCL patients aged ≥70 compared to younger patients, suggesting that older patients can tolerate and benefit from CAR T-cell therapy effectively. Further research is needed in the selection for older patients used by referring physicians.

Correspondences: Majed.Altareb@uhn.ca & Sita.Bhella@uhn.ca