Factors Influencing 30-Day Readmission Rates and Hospital Course for CD19 Directed CAR-T Cell Therapy in Non-Hodgkin's Lymphoma.

Raj Shah MD [1], Tiewei Cheng MD, PhD [2], Charmi Bhanushali MD [3], Nikhil Vojjala MD [4], Sanjana Mullangi MD [2], Leyla Shune MD [2]

[1] University of Kansas-Wichita, Wichita, Kansas, USA ; [2] University of Kansas Medical Center, Kansas City, Kansas, USA ; [3] Saint Vincent Hospital, Worcester, Massachusetts, USA ; [4] Trinity Health Oakland Hospital, Pontiac, Michigan, USA

Introduction

CD19 directed CAR-T cell therapy has become an important treatment modality in the management of relapsed/refractory non-Hodgkin lymphoma (NHL).

These treatments are often associated with significant complications that lead to adverse clinical outcomes.

Aim

To better understand clinical and economic burden associated with CD-19 CAR-T treatments.

Objectives

To study demographics, hospital outcomes and readmission risks for CD19 CAR-T

Methods

Data source: National Readmission Database 2021-22

Population : Patients receiving CD-19 CAR-T in the hospital

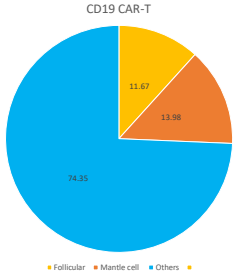
Primary outcome: 30-day readmission rates, risks associated with readmission, overall mortality, length of stay (LOS), and hospitalization costs.

Statistics: Univariate and Multivariate cox regression analysis to identify factors associated with readmission. Statistical significance was set at $p < 0.05$.

Results

Baseline characteristics :

- 4,040 patients met the inclusion criteria, with Mantle cell and Follicular lymphoma accounted for 13.98% and 11.67% CAR-T recipients.
- The cohort's mean age was 62.28 years with mean Elixhauser comorbidity index score of 3.93 (3.80-4.06), and up to 25.87% of patients had protein-energy malnutrition (PEM).



Complications :

- Complications included cytokine release syndrome (64.80%), neutropenia (39.56%), and ICANS(23.23%)
- Infectious complications include Sepsis(6.17%), Clostridioides difficile infection(5%), CMV(2.36%) and PCP(0.11%)

Complications	
CRS(All grades) Tocilizumab use	64.80% 6.40%
Neutropenia	39.56%
ICANS	23.23%
HLH	1.55%
Hx of BMT	15.47%
Infections • Sepsis • C diff infection • CMV • PCP	 6.17% 5% 2.36% 0.11%
ICU stay Mechanical Ventilation	22.06% 3.26%

Outcomes :

- Index admissions averaged 17.7 days and $1.4M in charges; readmissions averaged 8 days and $156 in charges. In-hospital mortality rose from index admission (2.7%) to readmission (4.7%).

Outcomes	Index	Readmission
Mortality	2.7%	4.7%
LOS in days	17.7	8
Total Charges($)	$1,422,400	$156,800

Readmissions :

- 753(19.16%) CAR-T recipients were readmitted within 30 days
- Multivariate analysis identified ICANS as increasing readmission risk (HR 1.680, $p<0.001$) while CRS was protective (HR 0.564, $p<0.001$).
- Elixhauser score (HR 1.121, $p=0.037$) and CKD (HR 1.675, $p=0.055$) increased readmission risk, while chronic antiplatelet use was protective (HR 0.574, $p=0.042$).
- For mortality, mechanical ventilation (OR 74.08, $p<0.001$), septic shock (OR 10.09, $p=0.002$), and transfusion (OR 7.30, $p<0.001$) were strongest predictors, while PEM significantly increased risk (OR 3.35, $p=0.017$).
- Readmissions (19.16% within 30 days) were primarily due to treatment complications (40.3%) and primary disease related (29.7%).

Summary

- One in five relapsed/refractory NHL patients who received CD19 directed CAR-T cell therapy was readmitted within 30 days.
- Post-discharge monitoring and prompt and effective interventions in high-risk subgroups are needed to reduce early hospital readmissions.

RAJ SHAH, KU-SCHOOL OF MEDICINE WICHITA
Email: rshah3@kumc.edu (M)216-392-5873