Chimeric Antigen Receptor T-cell Therapy Outcomes In The Inpatient Setting: A National Inpatient Sample Analysis From 2016 To 2020

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Introduction

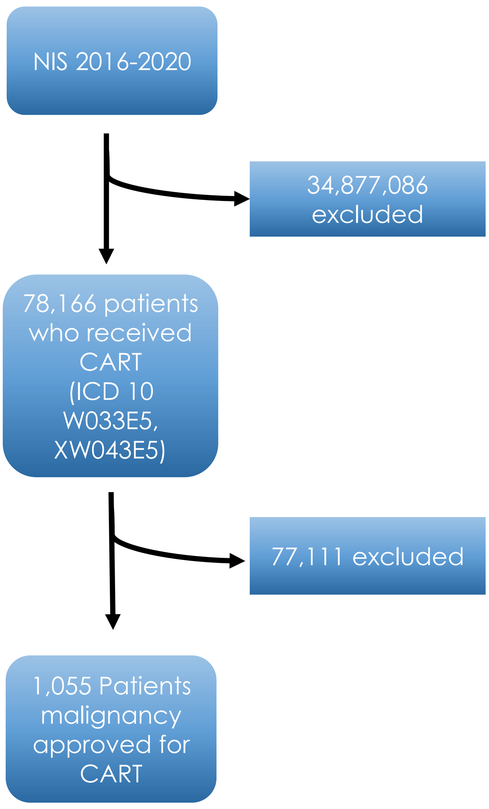
Chimeric antigen receptor T-cell (CAR-T) therapy has transformed the management of relapsed and refractory hematologic malignancies, offering hope to patients with limited treatment options.

This study analyzes the National Inpatient Sample (NIS) to assess inpatient outcomes associated with CAR-T therapy from 2016 to 2020.

Methods

Patients who received CAR-T therapy were identified in the NIS using ICD-10 procedure codes W033E5 and XW043E5. Only those with hematologic malignancies approved for CAR-T therapy were included in the final analysis.

Logistic regression was used to evaluate predictors of inpatient mortality, and linear regression was used for length of stay (LOS).



Results

Demographic factors and hospital characteristics were not significantly associated with inpatient mortality.

Hospitals in the South and West had longer LOS (by 2.6 and 2.8 days, respectively), and urban teaching hospitals were associated with a longer LOS (3.6 days).

Large hospitals were associated with lower inpatient mortality (Odds Ratio 0.4).

Complications occurred in 41.6% of patients and cytokine release syndrome (CRS) mortality was 26.5%.

Outcome	Rate
Inpatient mortality	19.5%
Sepsis	33.3%
CRS	6.4%
Febrile neutropenia	2.5%
Tumor lysis syndrome	1.4%

Malignancy	Percentage
Chronic lymphocytic leukemia	41.1%
Multiple myeloma	27.4%
Non-Hodgkin lymphoma	26.8%
Hodgkin lymphoma	2.4%
Acute lymphoblastic leukemia	2.3%

Discussion

Although CRS was relatively uncommon, its high mortality highlights the importance of prompt management, including early administration of tocilizumab, which may reduce symptom severity without compromising efficacy.

The absence of ICANS cases likely reflects the delayed incorporation of this diagnosis into ICD-10. As CAR-T therapy continues to expand, the number of patients receiving it is expected to grow.

Ongoing surveillance and research will be essential to better understand its long-term safety profile and optimize the management of side effects.

References

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