Medical ICU utilization after outpatient chimeric antigen receptor T cell therapy: A retrospective single center analysis

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INTRODUCTION

- Chimeric antigen receptor T-cell (CAR-T) therapy is becoming widely available, and new paradigms are being implanted to perform them in the outpatient setting.
- However, the multiple side effects, as well as the severity of these, often required hospital admission in different levels of care.
- Little work has sought to describe the utilization of intensive care unit (ICU) resources after performing CAR-T therapy in the outpatient setting.
- We performed a retrospective analysis of ICU utilization in patients who underwent outpatient CAR-T therapy in a large National Cancer Institutes (NCI)-designated cancer center and its associated university hospital.

METHODS

- After obtaining IRB approval, we performed a retrospective chart review of 79 adult patients who underwent outpatient infusion of CAR-T therapy at Stephenson Cancer Center, Oklahoma City, between September 2019 and November 2023.
- We included patient whose indication for CAR-T was a hematological malignancy and excluded patients who received cellular therapy for solid tumors.
- Outcomes reviewed: rate of ICU admission within 45 days after cellular therapy infusion, ICU admission diagnosis, length of stay and in-ICU mortality.

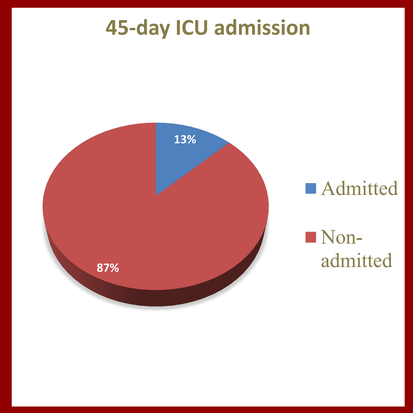

Fig 1. 45-day ICU admission rate.

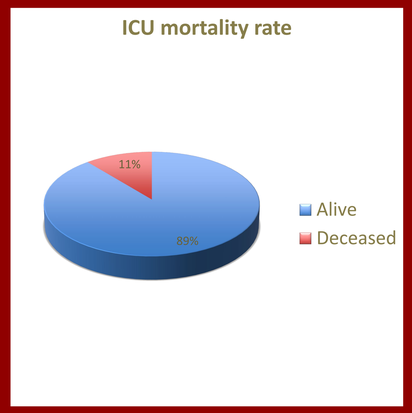

Fig 2. In-ICU mortality rate.

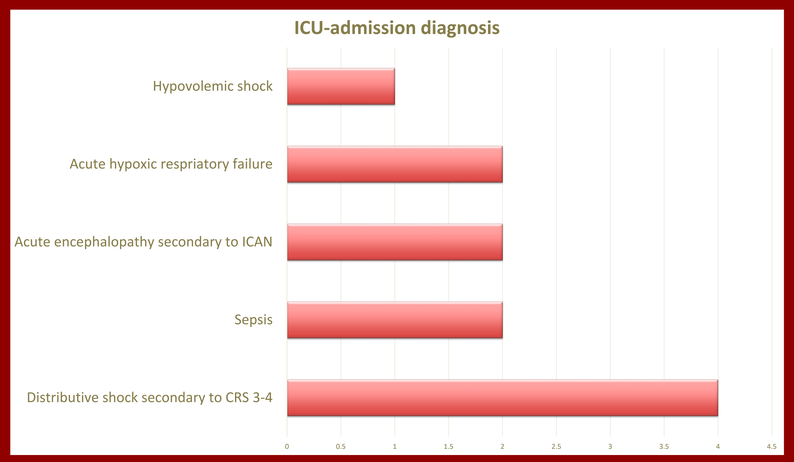

Fig 3. ICU admission diagnosis.

RESULTS

- We identified 79 patients who underwent ambulatory, FDA-approved CAR-T therapy infusion during the period between September 2019 and November 2023. Diagnosis included: non-Hodgkin lymphoma (72%), multiple myeloma (18%), and acute lymphoblastic leukemia (10%).
- Within 45 days of CAR-T infusion, 12.6% (10/79) of patients required medical ICU admission (one patient was excluded from analysis due to inability to obtain medical records during ICU admission).

RESULTS – CONT'D

- ICU admission diagnosis included: distributive shock secondary to CRS grade 3-4 (4/9), sepsis (2/9), acute toxic encephalopathy secondary to ICAN (2/9), acute hypoxic respiratory failure (2/10), hypovolemic shock secondary to hemorrhage (1/9).
- Mean ICU length of stay was 4.8 days (1-16). Among the 9 patients included in the analysis
- In-ICU mortality rate was 11% (1/9).

CONCLUSIONS

- In this study, we found a lower rate of ICU admission compared to rates reported in other similar studies for patient who underwent CAR-T therapy (of note, most previous studies are done in patients who underwent inpatient infusion of CAR-T therapy).
- In majority of cases, ICU admission is due to CAR-T associated toxicities. The rising potential for this type of therapy and its increase availability represents an increasing need for ICU resources that are commonly required for management of its toxicities.

REFERENCES

- Le Cacheux C, et al. Features and outcomes of patients admitted to the ICU for chimeric antigen receptor T cell-related toxicity: a French multicentre cohort. Ann Intensive Care. 2024 Jan 31;14(1):20. doi: 10.1186/s13613-024-01247-9. PMID: 38291184; PMCID: PMC10828176.