Immune Reconstitution And Infectious Complications Following BCMA-targeted CAR-T Therapy In Relapsed/Refractory Multiple Myeloma (RRMM).

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INTRODUCTION AND AIMS

- Multiple myeloma (MM) is an incurable plasma cell disorder
- Idecabtagene vicleucel (ide-cel) and ciltacabtagene autoleucel (cilta-cel) are two chimeric antigen receptor (CAR) T-cell therapy that target BCMA and have been recently approved in relapsed refractory (R/R) MM patients
- The aim of this study is to characterize the immune reconstitution, vaccine protection, and infectious complications following CAR-T therapy

METHODS

- Patients with RRMM who received standard of care CAR-T between May 2021-January 2023 were included.
- All clinical and laboratory data were censored at the time of disease progression or initiation of subsequent therapy.
- Infection severity was graded according to Common Terminology Criteria for Adverse Events (CTCAE) v5.0 and BMT CTN.
- Outcomes involving benchmark timepoints included patients with data within a 15-day window.
- Statistical analysis were performed using R.

RESULTS

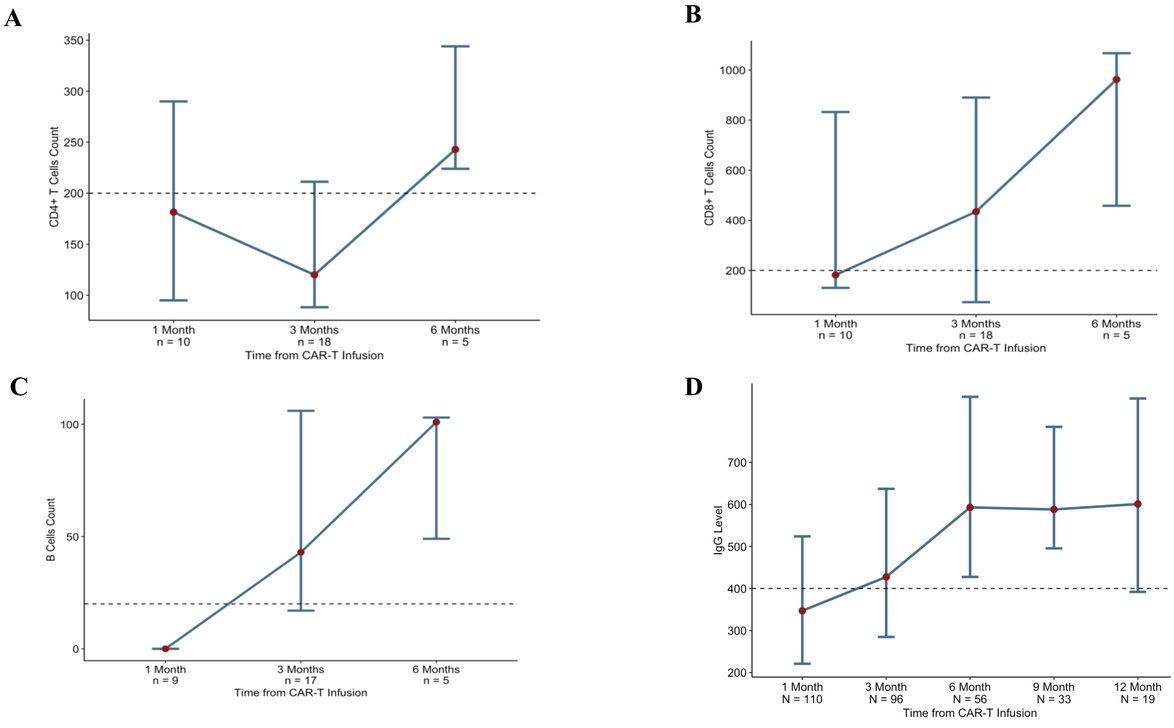
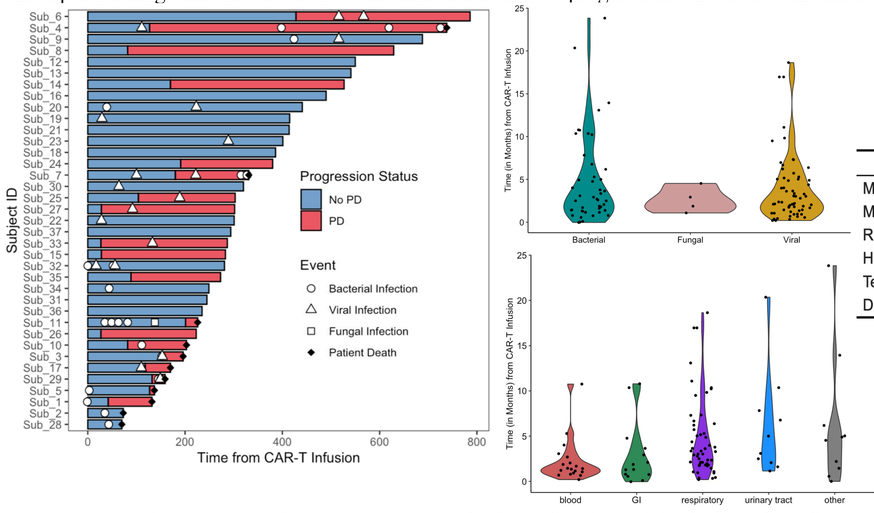


Figure 1. Immune recovery post CAR-T therapy. (a) CD4+ T cells (b) CD8+ T cells, (c) B cells, (d) IgG level. Median with interquartile range are shown. Counts were censored at time of progression. The dashed line indicates lower limit of normal.



	Positive	Negative	Equivocal
Measles	n=46 (74.19%)	n=16 (25.81%)	n=0 (0%)
Mumps	n=28 (45.16%)	n=27 (43.55%)	n=7 (11.29%)
Rubella	n=44 (68.75%)	n=17 (26.56%)	n=3 (4.69%)
HbAsB	n=42 (64.62%)	n=23 (35.38%)	n=0 (0%)
Tetanus	n=51 (83.61%)	n=10 (16.39%)	n=0 (0%)
Diphtheria	n=47 (77.05%)	n=14 (22.95%)	n=0 (0%)

Table 1. Vaccine titers.

Figure 2. Infections post CAR-T therapy. Infections (i.e., bacterial, viral, or fungal) were reported with specific symbols. Death as well as progressive disease status were included as events along the time of follow-up.

CONCLUSIONS

- Immune reconstitution is delayed following CAR-T with persistent B-cell aplasia and low T-cell counts, especially CD4+ T cells
- Many patients do not have serological evidence of immunity to vaccine-preventable diseases after CAR-T, suggesting that re-vaccination may be needed
- Data from additional cohorts to validate these findings are needed to formulate guidelines for infection prevention and vaccination in patients receiving BCMA CAR-T therapy.

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