From Response Rates to Toxicity Profiles: A Meta-Analysis of 2 FDA Approved CAR-T Therapies in Relapsed/Refractory Multiple Myeloma – 2025

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"Cilta-cel seems to have higher ORR, higher incidence of CRS and lower incidence of neurological events than Ide-cel. There is an absolute clinical difference but no statistical difference."

Introduction

- CAR-T cell therapy targeting B cell maturation antigen (BCMA) is now widely approved to relapsed/refractory multiple myeloma (r/r MM) and is moving into earlier treatment lines.
- Currently, Idecebtagene vicleucel (Ide-cel) and Ciltacebtagene autoleucel (Cilta-cel) are FDA-approved.

Aim

- To retrospectively analyse response rates and CAR-T specific toxicity profiles among these 2 FDA-approved therapies.

Objectives

- Compare and analyse Overall response rate (ORR), incidence of any cytokine release syndrome (CRS), any neurological events, and grade 3 or higher CRS/neurological events.

Methods

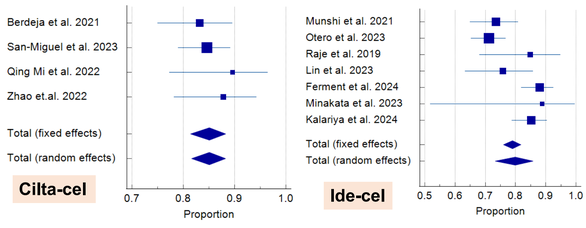
- Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were followed.
- Data sources: PubMed, Embase, Google Scholar.
- Out of 214 studies, we confirmed 4 studies on Cilta-cel and 7 studies on Ide-cel.
- Statistical methods: Software - MedCalc; Random effects model and Z-test were used for analysis
- $P < 0.05$ and Z-score > 1.96 – significant.

Results

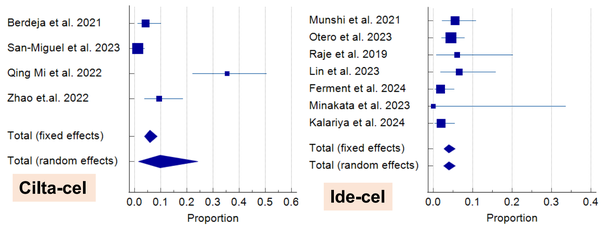
Outcome	Cilta-cel		Ide-cel		Z-score
	% (95% CI)	I^2 (%)	% (95% CI)	I^2 (%)	
ORR	85.07% (81.6-88.2)	0	79.9% (73.3-85.7)	76	1.44
Any CRS	90.6% (79.2-97.8)	90	84.8% (80.6-88.6)	52.2	1.12
≥ Grade 3 CRS	9.75% (1.5-24.2)	93	3.96% (2.6-5.58)	9.8	0.99
Any Neurological event	10.69% (2.7-22.9)	90.4	21.68% (15.5-28.5)	76.3	-1.79
≥ Grade 3 Neurological event	2.07% (0.08-6.6)	80.4	3.5% (2.3-4.9)	0	0.59

Results

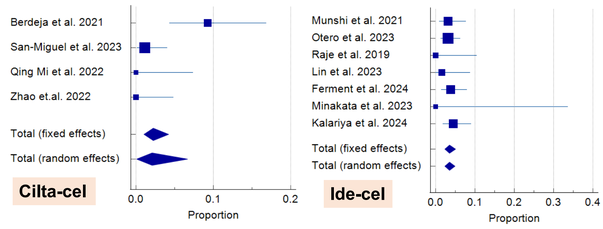
Overall Response Rate (ORR)



Grade 3 or higher CRS



Grade 3 or higher Neurological events



Discussion

- CAR-T therapy has higher complete remission, durability, and quality of life compared to the standard of care.
- Cilta-cel demonstrated higher overall response rate and CRS but lower neurological events compared to Ide-cel.
- Noted clinical difference but not statistical difference, underscoring cautious interpretation.
- These differences may guide personalized treatment selection.
- Can be limited by some publication bias, selection bias, reporting bias and heterogeneity.

Future Directions

- Need head-to-head randomized controlled trails, subgroup analysis and longer follow-up.

References and Full data

Please scan the attached QR code for full analysis and references, Thanks!!

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