SOHO ANNUAL MEETING 2024

Efficacy and Safety of Dual Antigen Targeting Chimeric Antigen Receptor T-Cells in Hematologic Malignancies: A Meta-analysis of Clinical Trials

Linus Zhen Han Yuen[1], Bingwen Eugene Fan, MRCP(UK), MMed (Int Med)[1], Wen Hon Darren Wee[1], Wen Xin Rachel Chua[1], Ryan Ruiyang Ling, MBBS[1], Kollengode Ramanathan, MD, FCICM[1], Muhammad Bilal Abid, MD, MS, FACP, MRCP, FRCP[2]

1 Yong Loo Lin School of Medicine, National University of Singapore, National University Health System, Singapore
2 BMT & Cellular Therapy Program, Department of Medicine, Medical College of Wisconsin, Milwaukee, WI

UTHealth The University of Texas Health Science Center at Houston

INTRODUCTION

Bispecific CAR T-cells simultaneously target 2 B-cell surface antigens (e.g., CD19/CD20, CD19/CD22) to potentially overcome antigen escape and heterogeneity expression in tumors.

AIM

Because early-phase, investigational clinical trials are typically small, we conducted a systematic review and meta-analysis of all available studies reporting data related to the efficacy and safety of bispecific CAR-T therapy.

METHOD

- The primary outcome was complete response.
- Secondary outcomes included partial response, objective response rate, cytokine release syndrome (CRS), and ICANS graded per the ASTCT criteria.
- We conducted random-effects meta-analyses and estimated pooled proportions, 95% CI.
- A sensitivity analysis was also conducted accounting for potential small-study effects, using the random-effects trim-and-fill method.

RESULTS

PRISMA Flow Diagram

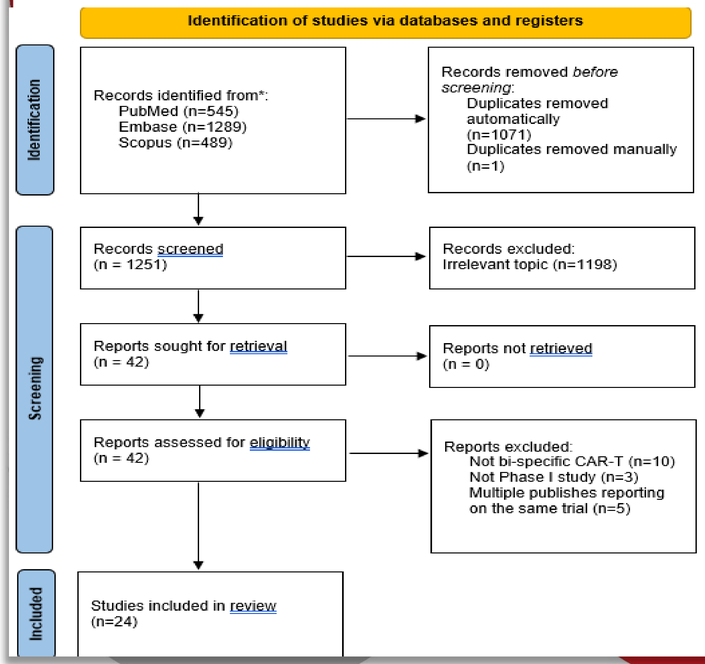


Table 1: Efficacy and Safety Outcomes with Dual Targeting CAR-T

Outcome	Studies, n	Patients, n	Pooled rates	95% CI
Complete response	25	328	69.1%	61.7-75.6%
Partial response	20	265	18.1%	11.6-27.0%
Progressive disease	18	240	10.7%	5.1-20.9%
CRS (all grade)	22	316	76.3%	55.4-89.3%
Grade 1 CRS	14	165	47.8%	32.9-63.1%
Grade 2 CRS	9	92	23.6%	8.1-52.0%
Grade ≥3 CRS	14	167	8.6%	4.1-16.9%
ICANS (all grade)	21	242	3.3%	0.9-11.0%
Grade ≥3 ICANS	21	242	0.05%	0-55.3%

CONCLUSION

The results overall demonstrate an impressive efficacy and tolerable safety profile for these engineered, bispecific constructs. Phase III studies with larger cohorts, longer follow-ups, and control arms are needed to further establish their safety profile and widespread applicability.

CONTACT INFORMATION

Email: Bilal_abid@hotmail.com

X: @BilalAbidMD