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abstract

Allogeneic Stem-Cell Transplantation Following Chimeric Antigen Receptor T-Cell for the Treatment of Relapsed/Refractory Hematologic Malignancy in Pediatrics and Young Adults: A Systematic Review and Meta-Analysis of Clinical Studies

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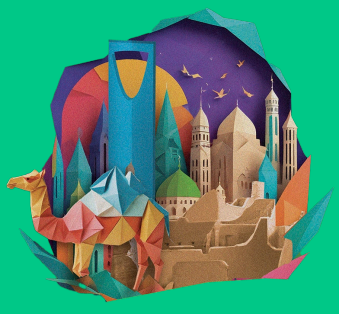

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abstract

Allogeneic Stem-Cell Transplantation Following Chimeric Antigen Receptor T-Cell for the Treatment of Relapsed/Refractory Hematologic Malignancy in Pediatrics and Young Adults: A Systematic Review and Meta-Analysis of Clinical Studies

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Introduction: This paper aims to ascertain whether incorporating consolidative allogeneic stem-cell transplantation (allo-SCT) after chimeric antigen receptor (CAR) T-cell therapy can augment the therapeutic outcome of pediatric and young adult patients with relapsed/refractory (R/R) hematologic malignancy.

Methodology: This review was reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) criteria. Pooled data from the meta-analysis were presented in a forest plot. Newcastle-Ottawa Scale (NOS) was used to determine the quality of studies. Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) was used to evaluate the confidence in cumulative evidence. The protocol had been recorded in the International Prospective Register of Systematic Reviews (PROSPERO) (CRD42023433417).

Results: We observed a trend of higher complete remission (OR 2.74; 95% CI 0.88 to 8.54) and lower mortality rate (OR 0.58; 95% CI 0.27 to 1.27) in the CAR T-cell + SCT group compared to those who did not proceed to SCT, although the difference was not statistically significant. There was a significant reduction of relapse rate among patients who received SCT after CAR T-cell therapy (OR 0.18; 95% CI 0.06 to 0.56).

In addition, both overall survival (OS) and leukemia-free survival (LFS) showed a favourable trend towards the CAR T-cell + SCT group, respectively (HR 0.44; 95% CI 0.25 to 0.77 and HR 0.29; 95% CI 0.17 to 0.49). Risk of bias assessment showed that all of the studies had good quality. The overall quality of evidence was low.

Conclusion: Allo-SCT following CAR T-cell infusion provides potential benefits for patients' survival. More clinical studies are warranted to elucidate the benefit of consolidative allo-SCT after CAR T-cell therapy.