CAR-T Cell Therapy Accessibility: A Targeted Review of Access Challenges and Opportunities in APAC Region

Acceptance code: HPR 157

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INTRODUCTION

- Chimeric antigen receptor (CAR) T-cell therapy represents a pivotal advancement in personalized cancer treatment, particularly for relapsed or refractory B cell malignancies, where it has become a standard of care.
- Despite its transformative impact on cancer immunotherapy, CAR T-cell therapy confronts significant challenges, including complex regulatory requirements and accessibility barriers in Asia-Pacific (APAC) region.

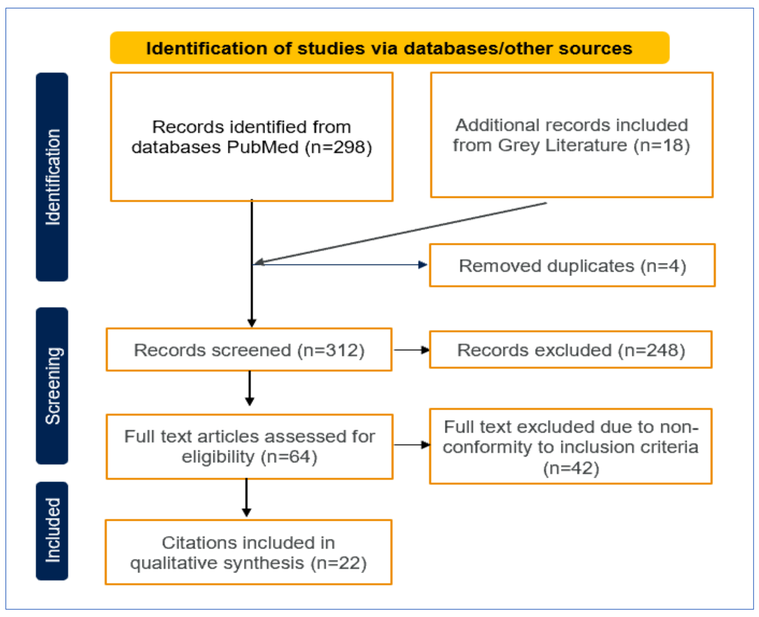
OBJECTIVE

- To evaluate the key barriers that influenced access to CAR-T cell therapy across the APAC region, including regulatory, economic, and healthcare infrastructure challenges.
- To identify potential opportunities and strategies that could have facilitated improved accessibility and affordability of CAR-T cell therapy within APAC countries.

METHOD

- We conducted a comprehensive literature search across PubMed and Google Scholar to explore the challenges and opportunities surrounding CAR-T cell therapy accessibility.
- Our review focused on studies addressing issues such as affordability, availability, equity, healthcare disparities, and barriers to access.
- Keywords included "Chimeric Antigen Receptor T Cells" OR "CAR-T Cells" AND ("Access" OR“ Availability" OR "Affordability" OR "Equity" OR "Healthcare Disparities" OR "Barriers").

Figure 1: PRISMA flowchart to summarize selection process



RESULTS

- The search yielded 316 studies from both databases and grey literature sources, with 64 selected for secondary screening. Ultimately, 22 studies were included in the final analysis.
- In the APAC region, public funding for CAR-T therapy primarily targets public pay markets and utilizes public-private partnerships (PPPs) to enhance healthcare system sustainability, exemplified by initiatives in Singapore.
- India has introduced NexCAR19, a locally developed CAR-T cell therapy for B-cell lymphoma/ leukemia, offered at a lower cost compared to other therapies.
- Meanwhile, Malaysia and Thailand are advancing CAR-T therapies through clinical trials, adopting them on a case-by-case basis. The diverse pharmaceutical landscapes and varying readiness levels across these countries highlight the impracticality of a one-size-fits-all approach.

Table 1: Table summarizing issues and challenges for CAR-T cell therapy accessibility in Asia and low- and middle-income countries (LMICs).

Category	Challenges	Impact/Burden
High costs	Production and delivery costs are high, with limited access to affordable CAR-T options.	Limits access for patients, particularly in LMICs, creating a financial burden for healthcare systems.
Manufacturing	Limited manufacturing facilities and complex logistics required for CAR-T cell production.	Long wait times and increased costs due to dependency on facilities abroad.
Infrastructure	Lack of specialized medical infrastructure and facilities for cell therapy.	Hinders the delivery and monitoring of CAR-T therapy, affecting treatment outcomes.
Regulatory hurdles	Regulatory approvals and standardization vary widely across countries, often slow in LMICs.	Delays availability and raises barriers to widespread CAR-T therapy adoption.
Trained workforce	Shortage of healthcare providers trained in CAR-T administration and post-treatment care.	Impacts patient outcomes and increases risk of adverse effects without adequate monitoring.
Socioeconomic factors	Many patients are unable to afford treatment, even with available CAR-T therapy options.	Exacerbates health inequities, with low accessibility for those in lower-income brackets.
Awareness and education	Limited awareness about CAR-T therapy among both healthcare providers and patients.	Results in underutilization of CAR-T options and missed opportunities for early intervention.
Data and monitoring	Lack of regional data collection on CAR-T outcomes and adverse events.	Complicates efforts to improve and adapt CAR-T therapy to regional needs and monitor long-term effects.

CONCLUSIONS

- Given the high costs associated with CAR-T cell therapy, collaborative funding mechanisms among payers are essential for enhancing affordability and access.
- Governments can play a pivotal role by subsidizing hospital expenses, covering product costs, offering grants, and streamlining approval processes.
- The diversity in healthcare infrastructures across APAC underscores the need for tailored, context-specific strategies to facilitate equitable access to CAR-T therapies.

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