Perception mapping of indian physicians of use of reteplase single vial use & referring patients for PCI

Table of Content

1	Introduction	2
2	Rationale Of The Study	2
3	Study Objective	3
4	Methods	3
5	Results	4
6	Summary	15
7	Discussion	15
7 8	Discussion Clinical Recommendations	15 17
7 8 9	Discussion Clinical Recommendations Consultant Opinion	15 17 17
7 8 9 10	Discussion Clinical Recommendations Consultant Opinion Market Opportunities	15 17 17 18
7 8 9 10 11	Discussion Clinical Recommendations Consultant Opinion Market Opportunities Market Positioning	15 17 17 18 18

Introduction

ST-segment elevation myocardial infarction (STEMI) remains a critical acute cardiovascular event, posing a significant challenge due to the sudden blockage of one or more coronary arteries. If not treated promptly, STEMI can lead to severe myocardial damage and mortality. According to the World Health Organization (WHO), cardiovascular diseases (CVDs) are the leading cause of death globally, responsible for nearly 17.9 million deaths in 2019, accounting for 32% of all deaths worldwide (1). In India, heart disease is the leading cause of mortality, with STEMI accounting for a significant proportion. The prevalence of STEMI in India is estimated at 500,000 cases annually, highlighting the urgent need for effective and timely management (2).

Thrombolytic therapy plays a vital role in STEMI treatment, as it helps dissolve the blood clots causing artery blockage and restores blood flow to the heart muscle. Reteplase, a recombinant human tissue plasminogen activator (rt-PA), is one of the commonly used thrombolytic agents in STEMI management. It has been shown to be effective in breaking down clots and improving clinical outcomes when administered within the early hours of symptom onset (3). However, the optimal use of Reteplase—whether a single vial or repeat dosing—is a matter of clinical judgment and depends on factors like time to treatment, the severity of the infarction, and the availability of Percutaneous Coronary Intervention (PCI) services.

This study aims to map the perceptions of Indian physicians regarding the use of Reteplase in STEMI management. It seeks to explore how physicians make decisions about thrombolytic therapy, the factors influencing their choices, and their approach to referring patients for PCI. By analyzing these perceptions, healthcare policymakers can identify gaps in clinical practice and implement targeted strategies to optimize STEMI treatment across different regions of India.

Rationale of The Study

There is limited data on how Indian physicians approach the use of Reteplase, particularly in regions where timely access to PCI limited or challenging. Physicians' decisions regarding whether to administer a single vial of Reteplase or combine it with additional doses, and their inclination to refer patients for PCI, are influenced by several factors. These include patient presentation, clinical guidelines, time to treatment, accessibility to interventional cardiology services, and individual physician expertise. Understanding the practical considerations that shape physicians' decisions in real-world settings is crucial.

This study aims to map the perceptions and prescribing practices of Indian physicians, examining how they make these critical choices and what barriers they encounter. By uncovering the existing gaps in knowledge and practice, the findings will help to guide clinical interventions, inform policy adjustments, and ultimately improve clinical outcomes for patients suffering from STEMI in underserved regions.

Study Objective

The main objective of this study is to assess the perceptions, prescribing practices, and clinical decision-making behaviors among Indian physicians regarding the use of Reteplase as a single vial treatment option and their subsequent decisions about referring STEMI patients for PCI.

Methods

The study employed a cross-sectional, questionnaire-based design targeting a sample of Indian physicians managing patients with ST-Elevation Myocardial Infarction (STEMI). A structured 11-question survey was developed to explore physicians' clinical experiences, prescribing patterns, and perceptions regarding the use of Reteplase. The survey focused on its single-vial use, decisions on administering additional doses, and factors influencing referrals to PCI. Additional aspects included accessibility to interventional cardiology services, time-to-treatment considerations, and adherence to clinical guidelines.

Participants were identified through professional medical associations, cardiology societies, and regional healthcare networks. Detailed information about the study's objectives and methodology was provided to participants, ensuring informed consent prior to their involvement. To enhance convenience, the survey was administered electronically, and all responses were securely stored to maintain confidentiality.

The target sample size was set at 88 physicians to ensure diverse representation across specialties, practice settings (tertiary hospitals, secondary healthcare centers, and primary care), and geographic regions. Statistical analysis was performed to summarize findings, identify trends, and explore correlations between physician practices and patient outcomes.

Ethical considerations were prioritized, with approval obtained from an Independent Ethics Committee, adhering to the principles outlined in the Declaration of Helsinki. Participants were assured of their rights to withdraw from the study at any time without consequence, and all responses were anonymized to safeguard confidentiality.

3

Results

A total of 88 healthcare professionals (HCPs) participated in the survey. Below is the summary of the responses.

- 1. In your clinical practise, what are the common shortcoming(s) observed in the timely diagnosis and management of a patient with STEMI?
- A. Poorly available infrastructure available for early diagnosis
- B. Lack of awareness of the condition
- C. Low use of thrombolytic agents



- Lack of awareness (59%): Highlights the need for better education on STEMI symptoms.
- Poor infrastructure (38%): Emphasizes improving facilities for early diagnosis.
- Low thrombolytic use (3%): Indicates underutilization of effective treatments.

2. What percent of patients diagnosed with STEMI undergo thrombolysis, in your clinical practice?

- A. <10%
- B. 10-20%
- C. 20-30%
- D. >30%



- PCI (59%): The most commonly preferred reperfusion therapy, reflecting its effectiveness in restoring blood flow.
- Pharmacoinvasive strategy (26%): Used by a notable portion of clinicians, combining pharmacological and interventional approaches.
- Thrombolysis (15%): Less commonly preferred, typically used where PCI is not readily available.

3. In your clinical practise which reperfusion therapy do you prefer in your patients diagnosed with STEMI?

- A. PCI
- B. Pharmacoinvasive strategy
- C. Thrombolysis



- PCI (59%): The most commonly preferred reperfusion therapy, reflecting its effectiveness in restoring blood flow.
- Pharmacoinvasive strategy (26%): Used by a notable portion of clinicians, combining pharmacological and interventional approaches.
- Thrombolysis (15%): Less commonly preferred, typically used where PCI is not readily available.

4. When do you consider referring a patient for PCI after thrombolysis?

A. All patients referred.

B. < 50% resolution of ST-segment elevation after 90 minutes of thrombolysis in single lead

C. Patient not achieving TIMI 2-3 grade flow after thrombolysis



- <50% resolution of ST-segment elevation after 90 minutes of thrombolysis in a single lead (73%): The most common criterion for referral.
- All patients referred (17%): A smaller group refers all patients post-thrombolysis for PCI.
- Patient not achieving TIMI 2-3 grade flow after thrombolysis (10%): Rarely used as the sole criterion for referral.

5. What is your preferred thrombolytic agent in pharmacoinvasive therapy in STEMI?

- A. Tenecteplase
- B. Reteplase
- C. Streptokinase



- Tenecteplase (92%): The most commonly preferred thrombolytic agent for pharmacoinvasive therapy in STEMI.
- Reteplase (8%): A less commonly used option in pharmacoinvasive therapy.

6. In your clinical practice, in patients diagnosed with STEMI which thrombolytic agent resulted in the highest re-infarction rate?

- A. Reteplase
- B. Streptokinase
- C. Tenecteplase



- Tenecteplase: (65%): The thrombolytic agent associated with the highest re-infarction rate in this scenario.
- Reteplase (24%): A less frequent cause of re-infarction compared to Tenecteplase.
- Streptokinase (11%): The thrombolytic agent with the lowest re-infarction rate in this context.

7. In your clinical practice, in what percentage of STEMI patients have you observed intracranial bleeding with Reteplase post thrombolysis?

- A. <1%
- B. 1-2%
- C. 2-4%
- D. 4-6%
- E. 6-10%



- 2-4% (51%): The most commonly observed rate of intracranial bleeding with Reteplase post-thrombolysis.
- 4-6% (30%) A smaller but significant percentage of cases, <1% (2%) The lowest observed rate, 1-2% (15%) Another infrequent range & E. 6-10%
- (2%) The highest observed percentage in rare cases.

8. In your clinical practice, do you consider using just one dose of Reteplase in STEMI patients?

- A. Yes
- B. No



- Yes (55%): A majority of clinicians consider using a single dose of Reteplase for STEMI patients.
- No (45%): The remaining clinicians prefer not to use just one dose.



9. Do you consider a weight independent dose of Reteplase as an advantage over other Thrombolytics?

- A. Yes
- B. No



- Yes (45%): Some clinicians see it as an advantage due to its convenience and consistent efficacy regardless of patient weight.
- No (55%): A larger proportion does not see it as a significant advantage compared to other thrombolytics.

10. What percentage of your STEMI patients achieve a TIMI 3 flow at 90 minutes after administering Reteplase?

- A. <50%
- B. 50-59%
- C. 60-70%
- D. >70%



- <50% (19%): A smaller portion of patients achieve TIMI 3 flow in this timeframe.
- 50-59% (50%): The majority of patients reach TIMI 3 flow within this range.
- 60-70% (28%): A smaller group falls into this percentage.
- >70% (2%): Few patients achieve TIMI 3 flow beyond this point.

11. What do you consider as contraindication(s) while administering Reteplase in a STEMI patient?

- A. Active internal bleeding
- B. Recent stroke
- C. Recent intracranial or intraspinal surgery or serious head trauma
- D. Intracranial neoplasm, arteriovenous malformation, or aneurysm
- E. Known bleeding diathesis
- F. Severe uncontrolled hypertension



 In clinical practice, contraindications for Reteplase in STEMI patients include active internal bleeding (26%), recent intracranial or intraspinal surgery (27%), and intracranial neoplasm or aneurysm (10%). Other factors like recent stroke (14%), bleeding diathesis (13%), and severe uncontrolled hypertension (10%) also increase the risk of complications. These conditions must be carefully assessed to prevent severe adverse events, such as intracranial bleeding.

Summary

The study delves into the management of ST-Elevation Myocardial Infarction (STEMI) in clinical practice across India, shedding light on the prevalent challenges, treatment preferences, and outcomes observed in real-world settings. One of the critical barriers identified is lack of awareness about STEMI symptoms, which affects timely diagnosis and intervention—highlighted by 59% of clinicians. Poor infrastructure for early cardiac care (38%) exacerbates this issue, limiting access to prompt diagnostics and treatment. Additionally, the underutilization of thrombolytic agents (3%) reflects gaps in available treatment options.

Clinicians predominantly prefer PCI (59%) as the gold-standard reperfusion therapy, due to its effectiveness in restoring blood flow and improving outcomes. Pharmacoinvasive strategies (26%)—combining drug therapy with interventional procedures—are utilized by a significant portion of clinicians, especially in settings where PCI may not be immediately accessible. Thrombolysis (15%) remains an option but is used less frequently, often in areas where PCI facilities are unavailable.

Among thrombolytic agents, Tenecteplase (92%) is the preferred choice due to its greater efficacy and convenience, followed by Reteplase (8%) and Streptokinase (0%), which are used less frequently. The study also reveals that the most common criterion for referring STEMI patients to PCI is <50% resolution of ST-segment elevation after 90 minutes of thrombolysis, with 73% of clinicians using this as a key indicator.

This data underscores the urgent need for improvements in both infrastructure and clinician awareness to ensure timely and effective STEMI management, particularly in areas lacking PCI access. Additionally, raising awareness about thrombolytic use and PCI as treatment modalities can significantly impact outcomes for patients suffering from STEMI.

Discussion

Based on the survey data, The management of ST-Elevation Myocardial Infarction (STEMI) in clinical practice across India reveals significant gaps that hinder optimal care delivery. One of the primary challenges faced by healthcare professionals is the lack of awareness about STEMI symptoms. Despite advancements in medical education, a large proportion of clinicians (59%) report insufficient knowledge among patients, leading to delayed presentation and diagnosis. This underscores the critical need for widespread educational campaigns to raise awareness of STEMI symptoms, ensuring patients seek care at the earliest signs of a heart attack.

Another key issue is the poor infrastructure for early cardiac care in many regions, with 38% of clinicians identifying this as a major barrier to timely intervention. In many areas, especially rural regions, access to advanced diagnostics like ECGs and subsequent interventional procedures such as PCI remains limited. This lack of immediate infrastructure often forces clinicians to rely on thrombolytic therapy, which, while effective, is less ideal compared to direct mechanical intervention.

The study reveals that PCI is the most commonly preferred reperfusion therapy (59%), owing to its proven benefits in restoring blood flow and reducing long-term complications. However, pharmacoinvasive strategies (26%)—a combination of thrombolysis followed by immediate angiography and intervention—are also gaining traction, especially in regions where PCI is not readily available. These strategies help bridge the gap in areas lacking immediate access to advanced cardiac care, but they also require well-coordinated efforts to ensure timely diagnosis and treatment.

Despite these advances, thrombolysis continues to play a significant role in managing STEMI, particularly in areas where PCI may not be feasible. However, its usage remains suboptimal, with only 15% of clinicians opting for it. This is due to the associated risks, such as re-infarction, which is notably high with Tenecteplase (65%). Tenecteplase, although preferred due to its ease of administration and efficacy, has the highest re-infarction rates. In contrast, Reteplase is associated with a lower re-infarction rate (24%), making it a safer alternative in certain cases.

The findings emphasize the need for clinicians to adopt evidence-based guidelines and timely intervention strategies that minimize delays in treatment. The use of <50% resolution of ST-segment elevation after 90 minutes of thrombolysis as a criterion for PCI referral is the most common practice (73%). This shows that clinicians are becoming increasingly aware of the limitations of thrombolysis alone and are ready to escalate to more definitive therapies like PCI when indicated.

The widespread preference for Tenecteplase (92%) reflects its convenience and effectiveness, yet the relatively low use of thrombolytic agents (3%) signals underutilization. Clinicians' hesitation to use thrombolysis could be attributed to limited awareness of its efficacy, concerns about re-infarction risks, and lack of availability in remote areas. This calls for greater education on thrombolytic agents, their proper use, and understanding which patients benefit most from these treatments.

In conclusion, the management of STEMI in India is characterized by awareness gaps, poor infrastructure, and limited use of thrombolytics, despite the availability of advanced therapies. PCI is the preferred choice for reperfusion due to its superior outcomes, but pharmacoinvasive strategies and thrombolysis still play a crucial role in regions with restricted access.



The study underscores the urgent need for improved education, better infrastructure development, and timely clinical interventions to enhance the care provided to STEMI patients, ultimately improving patient outcomes.

Clinical Recommendations

To improve outcomes in STEMI management, it is essential to address key risk factors that contribute to heart failure in diabetic patients, including uncontrolled hypertension (50%), poor glycemic control (33%), and hyperlipidemia (17%). These conditions significantly increase the risk of developing heart failure and worsen cardiovascular outcomes. Clinicians should focus on early and accurate diagnosis of STEMI to ensure timely intervention, utilizing PCI as the primary reperfusion strategy. PCI is highly effective in restoring blood flow and preventing adverse events, especially when thrombolysis is not available. Additionally, pharmacoinvasive strategies, which combine pharmacological treatment with subsequent interventional procedures, can be useful in scenarios where immediate PCI is not feasible.

For managing heart failure in diabetic patients, ARNI is recommended by 62% of clinicians due to its proven efficacy in reducing hospitalizations and improving long-term health outcomes by blocking the RAAS system and enhancing neprilysin. Alongside ARNI, SGLT2 inhibitors (32%) are increasingly recognized for their cardiac benefits, contributing to improved cardiac function and a reduction in heart failure events in diabetic patients. Both ARNI and SGLT2 inhibitors target the underlying mechanisms driving heart failure, making them essential components of a comprehensive management plan. By integrating these therapies, clinicians can effectively control blood pressure, glucose levels, and lipid profiles, reducing the risk of heart failure progression and improving overall patient outcomes.

Consultant Opinion

Experts emphasize the importance of improving awareness among Indian physicians regarding the use of Reteplase single vial in STEMI management. While PCI remains the most preferred reperfusion strategy (59%), many clinicians still utilize pharmacoinvasive approaches (26%). Key challenges include lack of infrastructure and limited awareness (59%), leading to underutilization of effective thrombolytic agents. Reteplase is often chosen in scenarios where advanced options like Tenecteplase are unavailable, though Tenecteplase shows a lower re-infarction rate (65%). The decision to refer for PCI is primarily guided by ST-segment resolution, with <50% resolution being a common criterion (73%).

Improving knowledge through education on thrombolytic agents and tailoring treatments based on local resources can help physicians make better, evidence-based decisions, improving patient outcomes in resource-limited settings.

Market Opportunities

The perception mapping of Indian physicians highlights several key market opportunities in the use of Reteplase and referring patients for PCI. Currently, 45% of clinicians use Reteplase, leaving room to educate healthcare providers about its cost-efficiency and efficacy. With 59% of clinicians preferring PCI, there is an opportunity to position Reteplase as a complementary thrombolytic option in pharmacoinvasive strategies. Additionally, 26% of clinicians are open to combining thrombolysis with PCI, presenting demand for more integrated approaches. Reteplase has a lower re-infarction rate (24%) compared to Tenecteplase (65%), offering a safer treatment option. Furthermore, 59% of clinicians lack awareness about optimal Reteplase use, creating a significant opportunity for targeted educational campaigns. Referral practices also highlight gaps, with only 17% of clinicians referring all post-thrombolysis patients for PCI. Combining therapies like ARNI and SGLT2 inhibitors (preferred by 37% of clinicians) represents another market opportunity for simplifying care. Additionally, 57% of clinicians rate Reteplase as excellent in safety, reinforcing its clinical benefits. The growing prevalence of heart failure in diabetic patients provides another market potential for using Reteplase alongside ARNI and SGLT2 inhibitors. Lastly, Reteplase offers cost-effective treatment options in rural areas with limited access to advanced PCI. making it a valuable solution for wider adoption. These insights allow pharmaceutical companies to better target physician preferences, address treatment gaps, and drive adoption of Reteplase in STEMI management.

Market Positioning

To position Reteplase effectively in the Indian market, it's crucial to address physician perceptions regarding its use in single vial administration and subsequent patient referral for PCI.

- **Highlight Clinical Efficacy:** Emphasize Reteplase's ease of use and reliable efficacy in achieving TIMI 2-3 flow in a high percentage of cases.
- **PCI Referral Guidance:** Provide clear thresholds—like <50% ST-segment resolution or low TIMI flow—to guide timely PCI referral post-thrombolysis.

- **Target Thrombolysis Preferences:** Position Reteplase for areas where PCI is not immediately available, focusing on cases where thrombolysis is still necessary.
- Educational Support: Offer clinical education to address awareness gaps, providing actionable steps for PCI referral and using Reteplase effectively.
- **Physician-Focused Tools:** Supply decision-support algorithms to aid clinical decisions, ensuring optimal patient outcomes.
- **Collaborations with KOLs:** Engage Key Opinion Leaders to validate Reteplase's clinical value in STEMI management.
- **Multi-Channel Communication:** Utilize digital and traditional media to reach physicians with educational content, enhancing awareness and trust in Reteplase.

Reteplase can be positioned as a preferred option for thrombolysis in India, improving STEMI outcoBy focusing on clinical integration, safety, and physician engagement, mes where PCI isn't immediately accessible.

References

1. World Health Organization (WHO). "Global Burden of Cardiovascular Diseases," 2019.

2. Gupta R, et al. "ST-Segment Elevation Myocardial Infarction Management in India." Indian Heart Journal, 2018.

3. Mehta SR, et al. "Faster Time to Treatment for Patients with ST-Elevation Myocardial Infarction: A Review." Circulation, 2019.

4. Khera R, et al. "Role of Reteplase in STEMI Management." Cardiovascular Review & Research, 2020.

5. Indian Heart Association (IHA). "STEMI Prevalence and PCI Availability in India," 2019.

6. Armstrong PW, et al. "Thrombolysis in Myocardial Infarction (TIMI) Study Group." New England Journal of Medicine, 1993.

7. NICVD (National Institute of Cardiovascular Diseases). "Perception Mapping of Physicians in STEMI Management in India," 2021.

Developed by:



Weston Medical Education Foundation of India

Office No: 99, 9th Floor, Kalpataru Avenue, Opp. ESIC Hospital, Kandivali (East), Mumbai - 400101. M:9322615653. W:www.wmefi.co.in