



“The Outcomes of Myocardial Infarction Undergoing Thrombolysis Treatment with Streptokinase and Reteplase”

Vidya M. Yelam(Kapse), Omkar N. Swami , Shahu V. Dhutmal, Sahil G. Shaikh , Deval K. Patil

Department of Pharmacy Practice, Shivlingeshwar College of Pharmacy, Almala.

(Received: 14 April 2024 Revised: 1 May 2024 Accepted: 18 June 2024)

KEYWORDS

Myocardial infarction , Heart attack , bleeding complications thrombolytic agents, Reteplase and Streptokinase

Abstract: To compare and assess the outcomes of patients with myocardial infarction undergoing thrombolysis, specifically evaluating the efficacy and safety of two commonly used thrombolytic agents, Streptokinase, and Reteplase.

Objectives: 1. To compare the Efficacy of Streptokinase and Reteplase in achieving reperfusion.

2. To examine the Safety Profiles of Streptokinase and Reteplase .

3. To analyze Short-Term and Long-Term Clinical outcomes.

4. To explore Subgroup Analyses Based on Patient characteristics.

5. To provide Evidence-Based Recommendations for Clinical decision making.

Methods: Prospective observational study in the clinical management techniques in thrombolysed case patients.

New life heart and Multi-speciality Hospital, Latur.

The present study was carried out from Nov 2023 to May 2024.

Study has included the total no of 31 cases for thrombolytic treatment.

Clinical outcomes of patients thrombolysed with Streptokinase and Reteplase

The sampling of study at the allotted hospital included the collection of Case papers of patients hospitalized, thereby taking all the data from the admission of the patient till the recovery he/she acquires. The data collected includes all the diagnostic parameters such as vitals monitoring, ECG, advised tests for the prognostic diagnosis, etc

Results: "Effects of thrombolytics" on the cardiac complications is the prospective observational study carried out in November 2023 to April 2024 at New Life Heart Care And Multi-speciality Hospital Latur. BP and HR. Study performed according to protocol given by Institutional Ethics Committee (IEC). Subjects are included according to patients selection criteria. In this study total 31 patients are included according to inclusion criteria .. clinical practice help optimize treatment strategies. Investigated the impact of the time elapsed from symptom onset to the initiation of thrombolysis on outcomes for both streptokinase and reteplase.

Conclusions: Both Streptokinase and Reteplase are effective thrombolytic agents in restoring blood flow to the heart in cardiac patients. While both drugs carry risks of bleeding complications, allergic reactions, and reperfusion arrhythmias, Reteplase may have a slightly lower incidence of adverse effects compared to Streptokinase. Streptokinase generally tends to be more cost-effective compared to Reteplase, making it a preferred option in resource-limited settings or for patients with financial constraints.

1. Introduction

The myocardial infarction is also called as a heart attack. It is the disease of the blood vessels supplying the heart

muscle the coronary heart disease. The myocardial infarction is the condition in which is caused by the reduced blood flow in a coronary artery due to atherosclerosis and occlusion of an artery by an



thrombus. The most common symptoms of myocardial infarction in the women include dyspnea, fatigue, weakness and the disturbances Myocardial infarction (MI) remains a significant cause of mortality and morbidity worldwide. Thrombolytic therapy plays a crucial role in restoring coronary blood flow and salvaging myocardium in MI patients. This study aims to compare the efficacy, safety, and clinical outcomes of two commonly used thrombolytic agents, Reteplase and Streptokinase, in the management of MI. This study underscores the importance of weighing the efficacy and safety profiles of thrombolytic agents in individual MI cases. Further large-scale randomized controlled trials are warranted to validate these findings and guide clinical decision-making in optimizing thrombolytic therapy for MI patients In the present era, thrombolytic therapy and primary percutaneous coronary intervention (PPCI) has revolutionized the way patients with AMI are managed resulting in significant reduction in cardiovascular mortality In the intricate landscape of myocardial infarction, thrombolysis emerges as a key intervention, wielding the power to dissolve the obstructive blood clots and restore the vital flow of circulation. Often referred to as Fibrinolysis, thrombolysis represents a beacon of hope in critical scenarios such as Myocardial Infarction. In this we will see Thrombolysis treatment with reteplase and streptokinase.

2. Objectives

1. To compare the Efficacy of Streptokinase and Reteplase in achieving reperfusion.
2. To examine the Safety Profiles of Streptokinase and Reteplase .
3. To analyze Short-Term and Long-Term Clinical outcomes.
4. To explore Subgroup Analyses Based on Patient characteristics.
5. To provide Evidence-Based Recommendations for Clinical decision making.

3. Methods

3.1. Study design:

Prospective observational study in the clinical management techniques in thrombolysed case patients.

3.2. Study site:

New life heart and Multi-speciality Hospital, Latur.

3.3 Study Duration:

The present study was carried out from Nov 2023 to May 2024.

3.4. Sample size :

Study has included the total no of 31 cases for thrombolytic treatment.

3.5 Focus of the study :

Clinical outcomes of patients thrombolysed with Streptokinase and Reteplase.

4.1. Sampling techniques:

The sampling of study at the allotted hospital included the collection of Case papers of patients hospitalized, thereby taking all the data from the admission of the patient till the recovery he/she acquires. The data collected includes all the diagnostic parameters such as vitals monitoring, ECG, advised tests for the prognostic diagnosis, etc.

4.2. Sample selection:

4.2.1. Inclusion Criteria:-

- Patients of age above 18 years
- Patients who are admitted for more than 24 hrs in ICU as well as General medical ward
- Patient receiving Thrombolytic treatment for Myocardial Infarction

4.2.2. Exclusion Criteria:-

- Patient of age below 18 years are excluded from the study
- Patients whose stay or treatment was less than 24 hrs.
- Patients without STEMI .

4.3. Data collection procedure:

Assessment of Risk in MI patients – The patient observed at hospital in Cardiac care units were seen to loose basic requirements of respiratory failure thereby monitoring the Vitals of patient (including the Blood pressure , oxygen demand , respiratory rate, heart rate, pulse rate, etc.). The physical examination observed included tachypnea, tachycardia, severe pain in left upper extremity, profused sweating , episodes of vomiting, chest pain radiating to back side , back pain ,



headache,etc. Laboratory investigation included the raised levels of cardiac markers (Tn T - >20.0 pg/ml), SGPT- >40.0 U/l The Echocardiogram showing the LVEF to < 40% , IWMI, AWTMI with TIMI grade ranges of I , II, III.

ECG for diagnosis

It is one of the highly important diagnostic tool we observed in hospital as the patient admitted in the hospital has to be assessed for its etiological findings so that the physician can examine current situation of the patient . ECG classifies immediate concerns for the patient as STEMI and NSTEMI . Since the presence or absence of STEMI determines the strategies for the clinical management

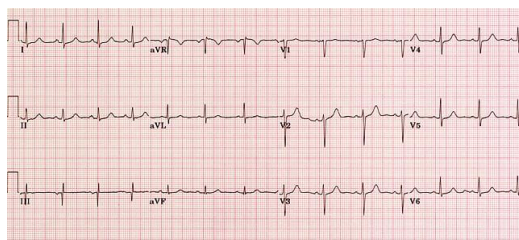


Figure No. 1 ECG

4.4 Questionnaire

- How do the rates of major adverse cardiovascular events (MACE) differ between patients treated with streptokinase and reteplase ?
- What is the impact of each thrombolytic agent on the size of the infarcted area in the myocardium ?
- How do patients’s demographics such as age and comorbidities influence the outcomes of thrombolysis with streptokinase and reteplase ?
- Are there significant differences in the occurrence of bleeding events or other adverse reactions between the streptokinase and reteplase ?

5. Observations and Results

5.1 Distribution as per Gender

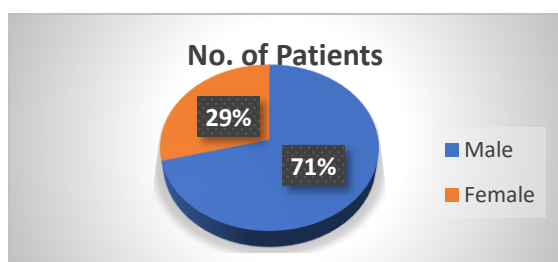


Figure No. 2 Distribution as per Gender

From the total cases collected for thrombolytic treatment procedure male population was predominantly observed with 71% than the female population.

5.2 Distribution as per Age Group

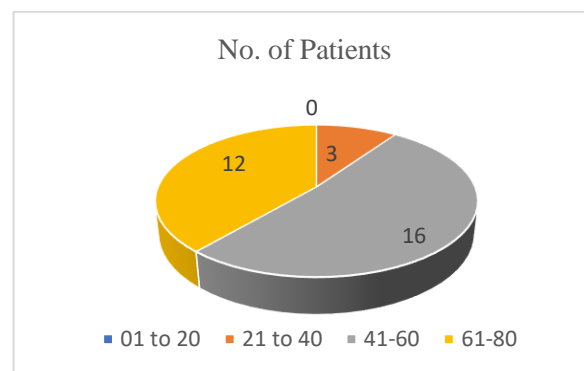


Figure No. 3 Distribution as per Age Group

This diagram shows the population of cases collected for the study of thrombolytic treatment being administered as per age criterion.

The cases for the cardiovascular condition included in the study with mostly affected age group is 41-60 yr ranging to the no. of 16 cases. And the 12 cases were from the age group 61-80 yr observed as 2nd largest category to be observed. 21-40 yr group has the least count of 3 cases.

5.3 Distribution as per Diagnosis

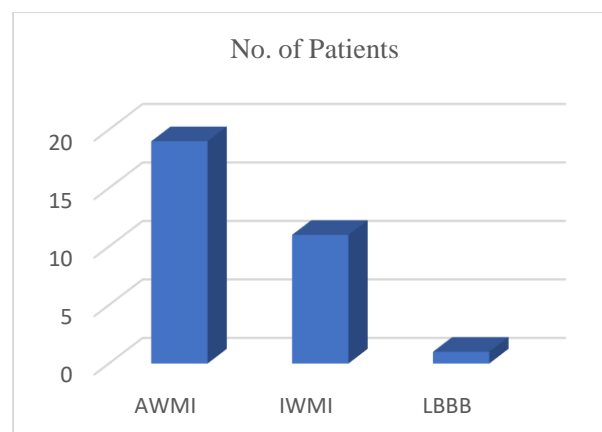


Figure No. 4 Distribution as per Diagnosis

Among the total cases collected the patients were observed for diagnosis of the cardiac complication included as the 2D Echo monitoring parameter as AWTMI -19 cases
IWMI - 11 cases
LBBB - 1 case



5.4 Distribution as per Thrombolytic Agent prescribed

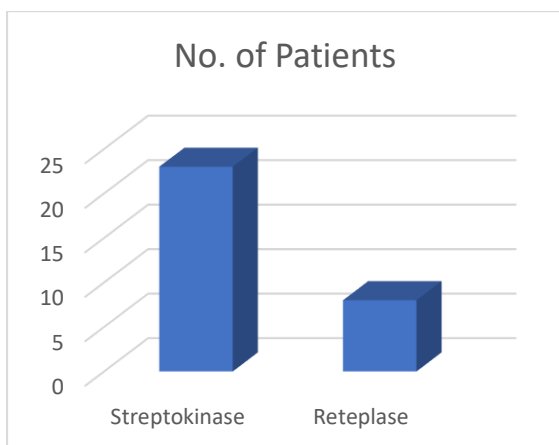


Figure No. 5 Distribution as per Thrombolytic Agent prescribed

From the total cases collected the thrombolytic treatment had the mostly prescribed cases for Streptokinase as thrombolytic agent with 74% than the reteplase for 26%.

5.5 Distribution as per STK given

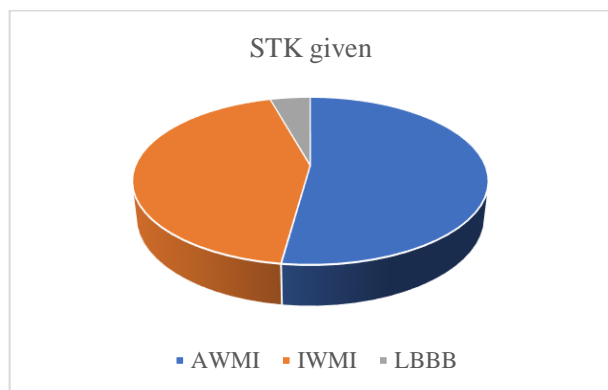


Figure No. 6 Distribution as per STK given

From the 2D Echo findings the cases which were prescribed the Streptokinase are as followed, Table 1 STK Given

Diagnosis	Streptokinase given
AAMI	12
IWMI	10
LBBB	1

5.6 Distribution as per Reteplase given

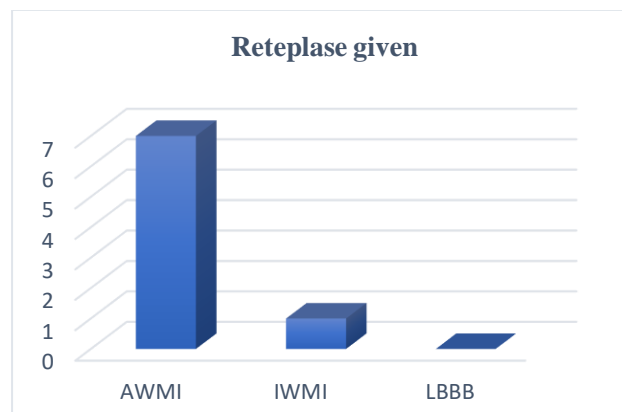


Figure No. 7 Distribution as per Reteplase given

Similarly the findings for the cardiac complication were given reteplase in 7 cases for AAMI and 1 case in IWMI.

6. Discussion

- The cases wherein the possible drug – drug interactions found are discussed for any further therapy failure.
- The possibilities of interaction such as additive effect, synergistic effect, antagonistic effect, agonistic effect are discussed as per the therapeutic window balance for the drug therapy.
- Monitoring the Vitals with therapeutic output efficacy are discussed.
- Justification points for the provisional diagnosis and final diagnosis are reviewed.
- Empirical research study for the possible symptoms ruling out is discussed.
- Details how each drug functions in clot dissolution and restoration of blood flow.
- Compare their effectiveness in restoring blood flow and preventing complications such as reinfarction or stroke.
- Analyze adverse effects such as bleeding complications, allergic reactions, or other adverse events. Discuss differences in dosing regimens, including frequency, route of administration, and ease of use.
- Evaluate the economic impact of each drug, considering factors like drug cost, hospital stay duration, and potential for rehospitalization.
- Examine clinical outcomes such as recurrence of myocardial infarction, and long-term prognosis.



- Highlight any specific patient populations where one drug may be preferred over the other due to contraindications or safety concerns.
- Clinical Guidelines and Recommendations: Review current guidelines and expert recommendations regarding the use of Streptokinase and Reteplase in cardiac patients.
- Discuss any recent studies or developments that may influence the comparative analysis or clinical decision-making.
- Suggest areas for further research or clinical investigation to optimize treatment strategies and improve patient outcomes.

7. Outcomes

The outcome of interest was MACEs as a composite of all non fatal MI, stroke, heart failure, or ischemia-driven revascularization follow-up.

1- Reperfusion Success:

Measure the proportion of patients achieving successful reperfusion after thrombolysis with

Streptokinase and reteplase, assessed by imaging or ECG criteria.

2- Time-to-Treatment Effect:

Investigate the impact of the time elapsed from symptom onset to the initiation of thrombolysis on outcomes for both streptokinase and reteplase.

3- Long-Term Follow-up:

Examine the long-term prognosis and complications, including heart failure and recurrent ischemic events, in patients treated with each thrombolytic agent.

4- Patient Subgroup Analysis:

Explore variations in outcomes based on patient demographics (age, gender) and comorbidities

5- Infarct Size:

Evaluate and compare the size of the infarcted area in the myocardium using imaging techniques Such as MRI or CT scan, 2D Echo etc.

6- Bleeding Events:

Assess the occurrence and severity of bleeding events, including intracranial hemorrhage and other major bleeding episodes, in patients treated with streptokinase and reteplase.

7- Cost-effectiveness:

Assess the cost-effectiveness of streptokinase and reteplase by considering healthcare resource utilization and associated expenses.

8. Conclusion

We collected data by reviewing hospital medical records using a standardized case report form. Data extraction included information regarding demographic characteristics, medical histories, presentation features, laboratory and echocardiographic parameters, medication, and clinical outcomes. From the total cases collected for thrombolytic treatment procedure male population was predominantly observed with 71% than the female population. The population of cases collected for the study of thrombolytic treatment being administered as per age criterion. The cases for the cardiovascular condition included in the study with mostly affected age group is 41-60 yr ranging to the no. of 16 cases. And the 12 cases were from the age group 61-80 yr observed as 2nd largest category to be observed. 21-40 yr group has the least count of 3 cases. Among the total cases collected the patients were observed for diagnosis of the cardiac complication included as the 2D Echo monitoring parameter as AAMI -19 cases , IAMI - 11 cases , LBBB - 1 case . From the total cases collected the thrombolytic treatment had the mostly prescribed cases for Streptokinase as thrombolytic agent with 74% than the reteplase for 26%. The findings for the cardiac complication were given reteplase in 7 cases for AAMI and 1 case in IAMI. Both Streptokinase and Reteplase are effective thrombolytic agents in restoring blood flow to the heart in cardiac patients. While both drugs carry risks of bleeding complications, allergic reactions, and reperfusion arrhythmias, Reteplase may have a slightly lower incidence of adverse effects compared to Streptokinase. Streptokinase generally tends to be more cost-effective compared to Reteplase, making it a preferred option in resource-limited settings or for patients with financial constraints.

Result:

"Effects of thrombolytics" on the cardiac complications is the prospective observational study carried out in November 2023 to April 2024 at New Life Heart Care And Multi-speciality Hospital Latur. The objectives of this study are to analyse the effects and complications of



thrombolytic agents in treatment to patients and to highlight the effects of thrombolytic agents on vitals of the patient i.e., BP and HR. Study performed according to protocol given by Institutional Ethics Committee (IEC). Subjects are included according to patients selection criteria. In this study total 31 patients are included according to inclusion criteria. The comparative analysis of Streptokinase and Reteplase would likely focus on their effectiveness, side effects, pharmacokinetics, dosing regimens, and clinical outcomes in treating conditions such as myocardial infarction or deep vein thrombosis. Streptokinase, a naturally occurring enzyme, and Reteplase, a recombinant form of tissue plasminogen activator, are both used as thrombolytic agents to dissolve blood clots. Studying their differences and similarities can provide insights into their respective roles in clinical practice and help optimize treatment strategies. Investigated the impact of the time elapsed from symptom onset to the initiation of thrombolysis on outcomes for both streptokinase and reteplase.

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