



## FACTORS INFLUENCING THE OUTCOME OF THROMBOLYSIS IN ACUTE MYOCARDIAL INFARCTION

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### ABSTRACT

**INTRODUCTION:** Coronary heart disease has been defined as "impairment of heart function due to inadequate blood flow to the heart compared to its needs, caused by obstructive changes in the coronary circulation to the heart"<sup>1</sup>. It is the cause of 25-30% of death is most of the industrialised countries. In India also it is a major public health problem. Definitive proof for the above said concept came from angiographic studies performed during the early hours of the acute coronary event. This prompted scientists to systematically test the thrombolytic strategies to treat Acute Myocardial Infarction, opening that new era of thrombolytic therapy in Acute Myocardial Infarction. Scientists have developed many effective thrombolytic drugs like, streptokinase, recombinant tissue plasminogen activator (rt PA), Reteplase (rPA), urokinase, APSAC (Anisoylated plasminogen streptokinase activator complex) etc. **AIMS AND OBJECTIVES:** To find out the overall success rate of thrombolysis in the coronary care unit of Govt. General Hospital. 2. To find out whether the following parameters influence the outcome of thrombolysis. **MATERIALS AND METHODS:** This study includes 83 patients meeting the inclusion and exclusion criteria, done in Alluri Sitarama Raju Academy of Medical Sciences from August 2019 to October 2020. **INCLUSION CRITERIA:** A) Presence of typical chest pain suggestive of Acute myocardial infarction along with ECG evidence of Acute myocardial infarction who were thrombolysed. Criteria for thrombolysis being 2 mm or more ST elevation in two contiguous precordial leads or 1 mm or more ST elevation in two contiguous limb leads. ECGs were recorded using Hewlett Packard Page write 100 machine. B) Time window of 12 hrs from the onset of pain to the initiation of thrombolysis. **EXCLUSION CRITERIA:** 1. Late thrombolysis (more than 12 hrs from the onset of pain). 2. Recurrent myocardial infarction. 3. Presence of bundle branch block. 4. Development of pericarditis. **DISCUSSION:** The relatively thicker wall, the increased wall thickening during systolic contraction and higher intracavitary pressure of left ventricle may all produce higher intramyocardial pressure than that is observed in the thinner walled right ventricle, which is also subjected to lower filling pressures. **CONCLUSION:** In this study the overall success rate of thrombolysis was 54%. Inferior wall myocardial infarctions had a better success rate than anterior wall myocardial infarctions and it was statistically significant. Smokers had a lesser success rate than non smokers, but it did not reach statistical significance.

### KEY WORDS :

#### INTRODUCTION:

Coronary heart disease has been defined as "impairment of heart function due to inadequate blood flow to the heart compared to its needs, caused by obstructive changes in the coronary circulation to the heart"<sup>1</sup>. It is the cause of 25-30% of death is most of the industrialised countries.

India also it is a major public health problem. It is aptly called by WHO as the modern epidemic. The increasing incidence of coronary heart disease may be a reflection of increased longevity,

adoption of high-fat diet based on meats, decreased exercise, modern life style, possible by increasing affluence. It is not surprising to note that Sir William Osler devoted only a few pages in his text book of medicine, published in 1892, to the discussion of Acute Myocardial Infarction. It was the brilliant work of Herrick in 1912, Who performed autopsy on Acute Myocardial Infarction patients that put forward the new concept of thrombotic occlusion of coronary artery as the cause of downstream necrosis of heart muscle. Definitive proof for the above said concept came from angiographic studies performed during the early hours of the acute coronary event<sup>2</sup>. Success rate of thrombolysis and thus the overall reduction in mortality is different among different agents used<sup>6</sup>. The GUSTO-1 trial showed a 30 day mortality of 6.3% for accelerated t-PA versus 7.4% for streptokinase with intravenous heparin. But

because of the prohibitive cost of tPA, streptokinase became the sheet anchor for thrombolytic therapy in Alluri Sitarama Raju Academy of Medical Sciences and hospital. Thrombolytic therapy has revolutionized the management of Acute Myocardial Infarction<sup>7</sup>. GUSTO angiographic sub study showed a success rate of 54% at 90 minutes using IV streptokinase and Heparin.

#### AIMS AND OBJECTIVES:

1. To find out the overall success rate of thrombolysis in the coronary care unit of Govt. General Hospital
2. To find out whether the following parameters influence the outcome of thrombolysis.

- a. Age
- b. Sex
- c. Time of Streptokinase administration
- d. Pre-infarction angina
- e. Alcohol intake
- f. Smoking status
- g. Pre-existing systemic hypertension
- h. Diabetes mellitus
- i. Location.

#### MATERIALS AND METHODS:

PLACE OF STUDY: This study was conducted in the coronary care

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unit of Alluri Sitarama Raju Academy of Medical Sciences and Hospital.

**PERIOD OF STUDY:** From August 2019 to October 2020

**DESIGN:** Observational prospective cohort study of patients receiving streptokinase for acute myocardial infarction. A total of 83 patients were included in the study.

**METHODOLOGY:**

**Inclusion Criteria:**

a. Presence of typical chest pain suggestive of Acute myocardial infarction along with ECG evidence of Acute myocardial infarction who were thrombolysed. Criteria for thrombolysis being 2 mm or more ST elevation in two contiguous precordial leads or 1 mm or more ST elevation in two contiguous limb leads. ECGs were recorded using Hewlett Packard Page write 100 machine.

b. Time window of 12 hrs from the onset of pain to the initiation of thrombolysis.

**Exclusion Criteria:**

- 1. Late thrombolysis (more than 12 hrs from the onset of pain).
- 2. Recurrent myocardial infarction.
- 3. Presence of bundle branch block.
- 4. Development of pericarditis.

**DEFINITION OF SUCCESS OF THROMBOLYSIS:**

Success was defined by: Clinical-complete subsidence of chest pain, Electrocardiographically-more than 50% ST resolution in a lead which showed maximum ST elevation initially. ST elevation is measured manually, 80 ms after J point from isoelectric line. Preceding PR segment is taken as isoelectric line. The following parameters were analysed among them to know whether they influenced the outcome of thrombolysis.

- 1. Age
- 2. Gender
- 3. Smoking status
- 4. Drinking status
- 5. Diabetes mellitus
- 6. Systemic Hypertension
- 7. Pre infarction angina
- 8. Location of Myocardial Infarction
- 9. Time of Streptokinase administration
- 10. Time interval between the onset of pain and the initiation of thrombolytic therapy.

**Results:**

A total of 83 patients were studied. Their age ranged from 31 - 76 years (mean 55.01) 68 of them were males (82%) and 15 females (18%); 20 of them were hypertensives (24%); 20 were diabetic (24%). 44 people were smokers (53%) and 29 (35%) used to consume alcohol. 23 patients experienced preinfarction angina (28%). 50 patients had anterior wall infarction (60%) and 33 patients (40%) had inferior infarction.

**TABLE- 1: Clinical details of study population according to the outcome of thrombolysis.**

VARIABLES	SUCCESS(%)	FAILED (%)
Number	44	39
Males	36	32
Females	8	7
Hypertension	11	9
Diabetes	11	9
Smoking	22	22
Drinking	20	9
Pre infarction angina	9	14

Age	30	18
Anterior wall infarct	20	30
Posterior wall infarct	24	9

**TABLE – 2: Univariate analysis for influencing factors.**

VARIABLES	ODDS RATIO	CHI SQUARE	P VALUE	COMMENTS
Age<60	2.5	4.11	0.04	Significant
Female		0.00	0.98	
Preinfarction angina	0.46	2.43	0.11	
Diabetes	1.11	0.04	0.83	
Anterior infarct	0.25	8.55	0.004	Significant

**TABLE – 3: Logistic regression analysis.**

VARIABLES	OR	P VALUE
Age<60	0.43	0.09
Drinking	3.16	0.06
Inferior infarct	3.18	0.02
Smoking	0.34	0.08

**DISCUSSION:**

The major finding of this study is that the location of the infarct significantly affects the outcome of thrombolysis. Those with inferior wall myocardial infarction have a 3.18 times chance of undergoing successful thrombolysis compared to anterior wall myocardial infarction (P=0.02). This is after adjustment for all confounding variable like time window, age, smoking status, gender, diabetes and hypertension. 25 Similar observations were made by C. Michael Gibson, Sabina Murphy and E. Braunwald et al. (TIMI study group). They found that TIMI grade III flow rates were lower for left coronary and circumflex artery compared to right coronary artery after thrombolytic therapy. The reason for this differential response will be evident when we look in to the physiology of coronary circulation in right and left coronary arteries. Blood flow in right coronary artery is relatively independent of phases of cardiac cycle, being present in both systole and diastole. Where as flow in left coronary artery is almost absent during systole and may even be reversed in conditions of heightened micro vascular tone and left ventricular hypertrophy

**CONCLUSION:**

- 1) In this study the overall success rate of thrombolysis was 54%.
- 2) Inferior wall myocardial infarctions had a better success rate than anterior wall myocardial infarctions and it was statistically significant.
- 3) Smokers had a lesser success rate than non smokers, but it did not reach statistical significance.
- 4) Alcohol intake was associated with a better success rate even though statistically not significant.

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