Original Research Paper

Medicine

ANALYSIS OF STREPTOKINASE AS FIBRINOYTIC AGENT IN PATIENTS WITH ST ELEVATION MYOCARDIAL INFARCTION

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ABSTRACT   **Introduction:** Acute Myocardial Infarction (AMI) is one of the clinical presentations of ischemic heart disease.1Myocardial Infarction is the most common contributor of morbidity and mortality worldwide. In 2000, the First Global MI Task Force presented a new definition of MI, which implied that any necrosis in the setting of myocardial ischaemia should be labelled as MI. The term (ACS) acute coronary syndrome was adopted because it was believed to more clearly reflect the disease progression associated with myocardial ischemia. Unstable angina and Myocardial Infarction (MI) both come under the ACS umbrella. Thrombolysis involves the administration of medication that activates the enzymes that normally destroy blood clots. Use of streptokinase as a thrombolytic agent is very common. **Methods:** Done a prospective study, includes 50 patients, All patients above 18 years of age presented with chest pain, Electrocardiogram proven ST elevation Myocardial Infarction will be included in this study. A detailed history and thorough examination will be done. Patient receiving streptokinase as thrombolytic therapy in duration with time frame has been evaluated.. On the basis of that the effectiveness of streptokinase in ST Elevation Myocardial Infarction will be measure. This study is used to identify the streptokinase success in STEMI in respect with time. **Results:** Within 1st hour, 5 patients out of 6 patients were recovered, where 83.3% calculated as successful rate of fibrinolytic therapy. In 2nd hour, 12 patients out of 19 patients were recovered, where 63.2 % calculated as successful rate. Similarly in 3rd and 4th hour, the successful rate was approx. 66.7% and 42.9 percent respectively. Overall successful rate of fibrinolytic therapy as streptokinase in STEMI was 64 %.

KEYWORDS : Myocardial Infarction , Streptokinase, Fibrinolytic therapy

Introduction

Myocardial Infarction is the most common contributor of morbidity and mortality worldwide.1 According to the American Heart Association (AHA), 785,000 Americans will have an MI this year and nearly 500,000 of them will experience another. 2 In 2006 nearly 1.4 million patients were discharged with a primary or secondary diagnosis of ACS, including 537,000 with unstable angina and 810,000 with either NSTEMI or STEMI (some had both unstable angina and MI).2

In 2000, the First Global MI Task Force presented a new definition of MI, which implied that any necrosis in the setting of myocardial ischaemia should be labelled as MI.3It is defined as the death of the heart tissue caused by lack of oxygenated blood flow to the myocardium. It belongs to a group of heart conditions known as Acute Coronary Syndromes. Most of the heart attacks are caused by a blood clot that blocks one of the coronary arteries In studies of disease prevalence, the World Health Organization (WHO) defined MI from symptoms, ECG abnormalities and cardiac enzymes. Myocardial Infarction (MI) can be recognised by clinical features, including electrocardiographic (ECG) findings, elevated values of biochemical markers (biomarkers) of myocardial necrosis, and by imaging, or may be defined by pathology.4

Myocardial Infarction (MI) can be classified based on size and location, or more commonly, on electrocardiographic findings, into ST-elevation MI (STEMI) and non-ST-elevation MI (NSTEMI).5,6 A STEMI is the combination of symptoms related to poor oxygenation of the heart with elevation of the ST segments on the electrocardiogram followed by an increase in proteins in the blood related to heart muscles death. For a person to qualify as having a STEMI, in addition to reported angina, the ECG must show new ST elevation in two or more adjacent ECG leads.

The current definitive treatment modalities for MI with ECG evidence of ST elevation (STEMI) includes thrombolysis and percutaneous coronary intervention and medical treatment. Early and prompt reperfusion is crucial as TIME LOST is equivalent to MYOCARDIUM LOST.7,8,9 Thrombolysis involves the administration of medication that activates the enzymes that normally destroy blood clots. Use of streptokinase as a thrombolytic agent is very common. Streptokinase is produced by beta-haemolytic streptococci. By itself, it is not a plasminogen activator, but it binds with free circulating plasminogen (or with plasmin) to form a complex that can convert additional plasminogen to plasmin. . Streptokinase is the least expensive fibrinolytic agent.

Thrombosis is an important part of the normal haemostatic response that limits haemorrhage caused by microscopic or macroscopic vascular injury. Rapid restoration of patency of the infarct-related artery is the key to preserve the myocardium and improving survival.10

Fibrinolysis during ST elevation Myocardial Infarction (STEMI) is feasible in the emergency departments (ED), and this reduces the delay from first medical contact to coronary reperfusion.

Therefore it has been decided to carry out the present study. "Evaluation of fibrinolysis with Streptokinase in ST-elevation Myocardial Infarction".

AIMS AND OBJECTIVE OF THE STUDY

- Evaluate fibrinolysis with streptokinase (SK) in ST Elevation Myocardial Infarction admitted to the ED.
- Identify clinical criteria predictive of fibrinolysis success.

MATERIAL AND METHODS

Study Design – Prospective Study (November 2014 to March 2016)
Study Population – all patients above 18 years of age complains of chest pain with the inclusion of ST Elevation Myocardial Infarction and thrombolysed by Streptokinase coming to the Emergency Department for treatment.

Setting – Department of Emergency Medicine, MGM Medical College and Hospital, Kamothe.

Methods- Detailed history will be taken from the patients and meticulous physical and systematic examination will be done according to the prepared Performa.

Total number of case studies – 50
All patients above 18 years of age presented with chest pain, Electrocardiogram proven ST elevation Myocardial Infarction will be included in this study. A detailed history and thorough examination will be done. Patient receiving streptokinase as thrombolytic therapy in duration with time like within 1, 2 hours, between 2 to 4 hours and 4 to 6 hours will be assessed. On the basis of that the effectiveness of streptokinase in ST Elevation Myocardial Infarction will be measure. This study is used to identify the streptokinase success in STEMI in respect with time.
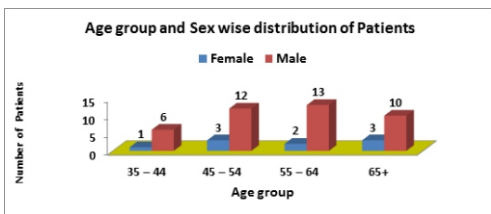
INCLUSION CRITERIA

1). Patients equal to or above 18 years of age.
2). both genders.
3). Complains of chest pain.
4). Electrocardiogram proven ST elevation MI.

Exclusion criteria

1). Traumatic chest pain.
2). Non ST Elevation MI.

## Observation & Results

Overall 50 cases are included in this study just fulfilled the inclusive and exclusive criteria. Out of the cases 9(18%) patients were females and 41(82%) were males and their age 35 years and more. The youngest patient in this study was aged 38 year and the oldest patient in this study was aged 75 year.
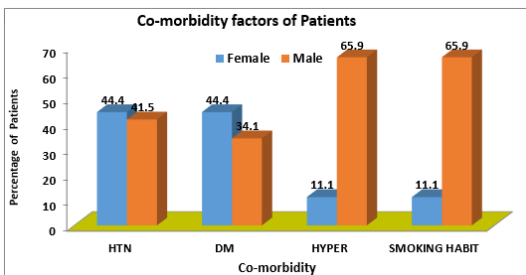
Overall 21(42%) in both sex were having Hypertension (HTN) and 18(36%) were having Diabetes Mellitus (DM), similarly 28(56%) were also having (HYPER) hyperlipidaemia. Smoking habits were found to be 28(56%) in patients and considered as the risk factor in this study.
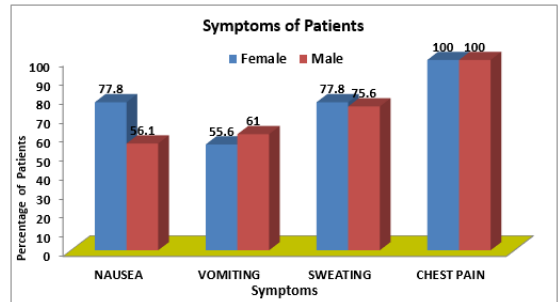
Overall all the patients had complained of chest pain which was 100% in both male and female.77% female and 56% patients had experienced of nausea, approx. 55% female had complained of vomiting whereas in male patients, it found to be 61%. Similarly 76 % patients had sweating associated with chest pain.
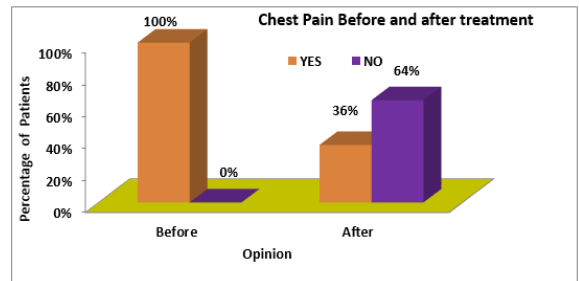
Statistically highly Significant at 0.01% level i.e., P<0.001.Table -5 shows that 100% (50) patients had complained of chest pain before taking any treatment whereas, after taking fibrinolytic therapy and other associated medical treatment, only 36 % (18) complained of chest pain. Which showed statistically highly significant at 0.01 % i.e., P<0.001. After treatment overall 64 % patients were not experienced any chest pain.
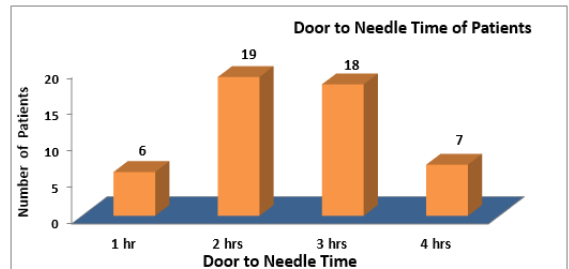
Door to needle time was the time calculated from the time when patient had experienced chest pain till the time of fibrinolytic therapy. Door to needle time of 60 minutes was achieved in 12% patients. 38 % patients had a door to needle time was within 120 minutes. Similarly the door to needle time was 36% and 14 % during 3 hour and 4 hour.

Average mean value of door to needle time was noted around 123.1 minutes. In our study, the minimum door to needle time was around 42 minutes and maximum time was noted around 216 minutes
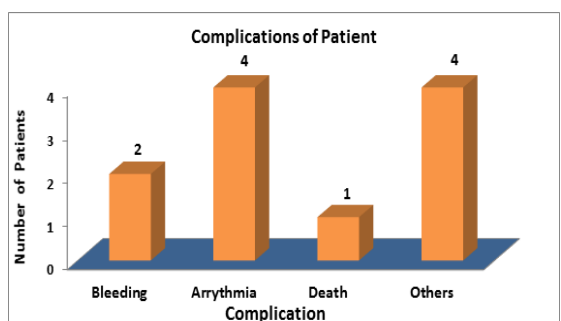
Overall 11(22%) patients had visible complications. Bleeding occurred in 4 % patients, arrhythmia occurred in 8 %(4) patients. One elderly patient had died due to complication. 8 %(4) patients had experienced other complication like dyspnea, urticaria, pruritus, flushing, nausea, headache.
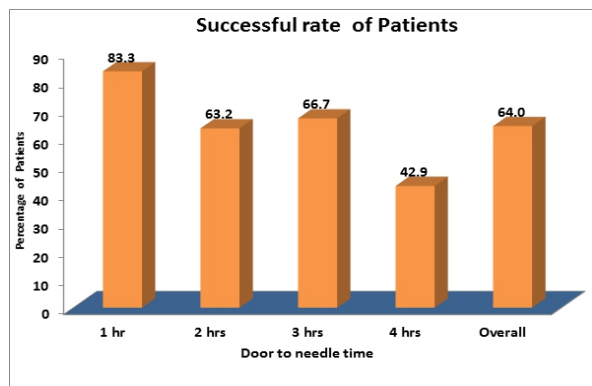
Within 1st hour, 5 patients out of 6 patients were recovered, where 83.3% calculated as successful rate of fibrinolytic therapy. In 2nd hour, 12 patients out of 19 patients were recovered, where 63.2 % calculated as successful rate. Similarly in 3rd and 4th hour, the successful rate was approx. 66.7% and 42.9 percent respectively. Overall successful rate of fibrinolytic therapy as streptokinase in STEMI was 64 %.

CONCLUSION

Myocardial Infarction is the most common cause of death. Mostly, the death occurs due to ventricular fibrillation soon after the onset of ischaemia. The main aim of the treatment is to decrease the size of the infarct. Fibrinolytic therapy with streptokinase or tissue plasminogen activator (tPA) restores coronary patency and significantly reduces mortality.

The STEMI patients usually present with chest pain, sweating, nausea, vomiting, radiating pain to left shoulder, neck or jaw. The major risk factors in our study were hyperlipidaemia and smoking habits. Most of patients were also associated with diabetes and hypertension. Thus measure to ensure adequate control of hypertension, diabetes and abstinence from smoking habits. So efforts must be directed towards better understanding and modification in their life style to reduce risk factors.

Fibrinolytic therapy is a proven treatment for the management of acute MI (AMI).Its efficacy declines as the duration of ischemia increases. In our study, the Door to Needle time was ranged between 42 minutes to 216 minutes. . Patients older than 75 years derive significant benefit from fibrinolytic therapy, even though their risk of bleeding is higher.

This study evaluates and identifies the success rate of streptokinase as fibrinolytic agent in STEMI patients. In this study, the overall success rate of streptokinase was 64 % and found to be 84 % success in first hour. This study also emphasizes the need of awareness in patients, in pre- hospital care and well equipped ambulance regarding the time factor involved in the fibrinolytic therapy.

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