The Comparison between the Outcomes of Streptokinase and Primary Percutaneous Coronary Intervention in Acute Myocardial Infarction

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Abstract

Background: To compare between the outcomes of streptokinase and primary PCI in acute myocardial infarction. The inappropriate treatment, misdiagnosis, contraindications of procedures can result in complications of procedures and increased mortality of patients. The present study aimed to compare between the outcomes of streptokinase and primary percutaneous coronary intervention in acute myocardial infarction patients to minimize the death rates in MI patients.

Methodology: The descriptive study was conducted at Gulab Devi Chest Hospital. All the samples were collected from cardiac department. A Performa was designed for recording the risk factors, ST elevation, clinical findings and lab results of the patients.

Results: In this cross-sectional study of 100 patients, the mean age was 51.02± 10.956. Male gender was predominant. There were more chances (67.00%) of acute LVF in streptokinase and less chances (21.00%) in primary PCI. According to this study, there was more chances (67.00%) of cardiogenic shock in streptokinase and less chances (21.00%) in primary PCI. In this study there were equal chances of stroke in streptokinase and primary PCI. In this study there were more chances (28.00%) of bleeding from any site in streptokinase and less chances (0%) in primary PCI. According to results there were chances (24.00%) of renal failure in streptokinase and less chances (0%) in primary PCI. There were more chances (9.43%) of rescue PCI in streptokinase and less chances in primary PCI. In this study, there were more chances of arrhythmias (26.41%) in streptokinase patients and less chances in primary PCI. In this study, there were also more chances of death (1.92%) in streptokinase and less chance in primary PCI. So according to my study primary PCI was better than streptokinase with less complications.

Conclusion: Primary PCI was better than streptokinase to cure the myocardial infarction and better to minimize the complications after procedure.

Keywords: Streptokinase, Primary PCI, Myocardial Infarction, Acute Coronary syndrome, Non-ST-segment elevation myocardial infarction

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Introduction:

Myocardial infarction (MI) occurs when blood flow stops to a part of the heart causing damage to the heart muscle. Cardiovascular disease is a leading cause of death globally. More than 920,000 myocardial infarctions (MI) are diagnosed annually in the United State (1). Of these, about 500,000 ST-elevation myocardial infarctions (STEMI) are estimated to occur each year (2). Despite significant advancement made in diagnosis and treatment of this condition during the last 4

decades, acute MI remains as a major public health issue in developed countries.

Comprehensive management of STEMI is a complex healthcare problem, requiring expensive hospital-based infrastructure and highly trained medical personnel. Outcomes are dependent on the patient's immediate environment, pre-hospital access and transportation, and in-hospital care. The time from the onset of symptoms to the reperfusion of the infarct related artery, often measured in minutes, is crucial to the clinical outcome of the patient.

In hospital survival has improved due to several factors, most importantly due to the use of reperfusion therapy (3). Reperfusion treatment in acute myocardial infarction aims at early and sustained reperfusion of the myocardium at risk (4). Reperfusion can be obtained by thrombolysis or primary coronary intervention (PCI). Several studies have demonstrated a better survival in patients with acute STEMI treated with primary PCI, when compared with treatment with thrombolysis (5).

Reperfusion therapy is considered a major achievement in the treatment of MI. Despite advancements in new fibrinolytic medications for MI, no significant progress is observed in the survival of patients. This could be attributed to limited effect of coronary artery blood flow, re-infarction, and complication of bleeding (6). In patients who underwent thrombolytic therapy by streptokinase and other similar agents, only one-third develop complete and early blood flow and re-stenosis occurs in 10% of the patients during hospitalization and further in one-third of the patients during the first 3-month after discharge from hospital (7).

Fibrinolytic therapy has some limitations which include limitation in administration of the agent in a specific time period following MI, presence of absolute and relative contraindications like those with history of gastrointestinal or intracranial bleeding and recent surgery; it also has side effects which can be fatal like major haemorrhages (8). Because of these limitations, researches have tried to develop new treatments and compare them with the current therapeutic methods. Primary angioplasty has been shown to be superior to thrombolytic therapy for treatment of patients with acute ST segment elevation myocardial infarction in randomized trials (9). Primary PCI within 90 minutes of first medical encounter is recommended as a treatment of choice for patients presenting to hospitals with PCI capability (10).

The growth of PPCI has been remarkable. Stents are now used in more than 80% of PPCI cases in the United States and Asian countries. This prominent use of stents will be sustained they result in improved outcomes. Over the past two decades, innovations in PPCI have been paralleled by dramatic reductions in 30-day death, Myocardial infarction (MI), and target-vessel revascularization rates.(11). Primary PCI should be the treatment of choice in patients presenting with STEMI in a hospital with PCI facility and an experienced team. Patients with contraindications to thrombolysis should be immediately transferred for primary PCI, because this might be their only chance for quickly opening the coronary artery. In cardiogenic shock, emergency PCI for complete revascularization may be life-

saving and should be considered at an early stage. (12)

The rationale of this study was to compare the outcomes of streptokinase and primary percutaneous coronary intervention in acute myocardial infarction patients, so that the batter decision may be taken when it is required because there is a very short time to save the patient after the acute myocardial infarction. Their drawbacks may be followed by someone else to improve the life status of patients with MI.

Streptokinase:

Derived from streptococci, this product is an effective thrombolytic agent for the treatment of acute myocardial infarction and pulmonary thromboembolism. Acting by converting plasminogen to plasmin, the main fibrinolytic enzyme, it potentiates fibrinolysis. However, it is not site specific, lysing thrombus anywhere in the body.

Being bacteria derived, it is antigenic, and repeated administration results in neutralising antibodies and allergic reactions. For example, a single administration of 1.5 MU for acute myocardial infarction results in neutralising antibodies that have been shown to persist for up to four years and are sufficient to neutralise a repeat administration of a similar dose of the agent in half of cases.(13)

Mechanism of action: Streptokinase belongs to a group of medications that is fibrinolytics, and complexes of streptokinase with human plasminogen can hydrolytically activate other unbound plasminogen by activating through bond cleavage to produce plasmin. Denoted, α (residues 1–150), β (residues 151–287), and γ (residues 288–414), are three domains to streptokinase. Although none can activate plasminogen independently, each domain binds plasminogen (14).

Plasmin is produced in the blood to break down fibrin, the major constituent of blood thrombi, thereby dissolving clots once they have fulfilled their purpose of stopping bleeding. Extra production of plasmin caused by streptokinase breaks down unwanted blood clots, for example, in the lungs (pulmonary embolism). The usual activation of Plasminogen (Plgn) is by proteolysis of the Arg561—Val562 bond (15).

The formation of a salt-bridge between amino group of Val562 and Asp740 occurs, which triggers a conformational change producing the active protease Plasmin (16). When (SK) is present, it binds to Plgn to form a complex (SK. Plgn) that converts substrate Plgn to Pm. By a non-proteolytic mechanism, residues 1–59 of SK regulate its capacity to induce an active site in bound Pg and to activate substrate Pg in a fibrin-independent manner.

This complex subsequently rearranges to an active complex although the Arg561–Val562 bond remains intact. Therefore, another residue must substitute for the free amino group of Val562 and provide a counterion for Asp740 in this active complex (17).

Two candidates for this counterion have been suggested: Ile1 of streptokinase and Lys698 of Plgn. Deletion of Ile1 of SK markedly inhibits its capacity to induce an active site in plasminogen, which supports the hypothesis that establishment of a salt bridge between Ile1 of SK and Asp740 of plasminogen is necessary for SK to induce an

active site in plasminogen by a non-proteolytic mechanism (18).

On the other hand, with the Ile1 substitutions, the Lys698 mutations also decreased the dissociation constant of the SK complex by 15 to 50 folds. These observations suggest that Lys698 is involved in formation of the initial SK·Plgn complex (19).

Contraindications: The contraindications to streptokinase were streptokinase administration within the previous 6 months, allergy to the drug ,surgery or cerebrovascular accident within the previous 6 weeks warfarin therapy ,active peptic ulcer disease, bleeding disorders uncontrolled hypertension or diabetic proliferative retinopathy (20).

Primary PCI:

Primarily, PCI is used to open a blocked coronary artery and restore arterial blood flow to heart tissue, without requiring open-heart surgery. The use of stents has been shown to be important during the first three months after PCI; after that the artery can remain open on its own (21).

In patients having any coronary stenosis greater than 50 percent or having angina symptoms that are unresponsive to medical therapy, PCI may be appropriate (22).PCI likely provides better relief of angina but don't provide any greater help in preventing death or myocardial infarction over oral medication for patients with stable coronary artery disease (23, 24).

In patients with acute coronary syndromes, PCI may be appropriate; guidelines and best practices are constantly evolving. In patients with severe blockages, such as ST-segment elevation myocardial infarction (STEMI), PCI can be critical to survival as it reduces deaths, myocardial infarctions and angina compared with medication (25). For patients with either non-ST-segment elevation myocardial infarction (NSTEMI) or unstable angina, treatment with medication and/or PCI depends on a patient's risk assessment (26).

Streptokinase is recommended intravenously as soon as possible after the onset of a ST elevation myocardial infarction (STEMI), if percutaneous coronary intervention (PCI) is not available within 90-120 minutes of first contact. It is recommended that this medication should not be used again after four days from the first administration as Streptokinase is a bacterial product, the body can build up an immunity to it and as it may not be as effective and can also cause an allergic reaction.

The use of PCI in addition to anti-angina medication in stable angina does not reduce the risk of death, future myocardial infarction or need for other interventions but may reduce the number of patients with angina attacks for up to 3 years following the therapy (23, 27).

Contraindications and adverse effects:

Contraindication: History of chronic, severe, poorly controlled hypertension, Significant hypertension on presentation (SBP >180 mm Hg or DBP >110 mm Hg), History of prior ischemic stroke more than 3 month ago.

Dementia, known intracranial pathology not covered in absolute contraindications, Traumatic or prolonged (>10 min) CPR, Major surgery less than three weeks ago, Recent (within 2 to 4 weeks) internal bleeding.

Non compressible vascular punctures, Pregnancy, Active peptic ulcer, oral anticoagulant therapy, Any prior intracranial haemorrhage, Known structural cerebral vascular lesion (e.g., arteriovenous malformation), Known cancer inside the skull (primary or metastatic), Ischemic stroke more than 4.5 hours and less than 3 months ago, Suspected aortic dissection and Active bleeding or bleeding problem other than menstruation are different contraindications of streptokinase (28).

Adverse effects: Coronary angioplasty is widely practiced and has a number of risks (29). However, major procedural complications are uncommon. Coronary angioplasty is usually performed using invasive catheter-based procedures by an interventional cardiologist, a medical doctor with special training in the treatment of the heart (30).

Deterioration of kidney function can occur in patients with pre-existing kidney disease, but kidney failure requiring dialysis is rare. Vascular access complications are less common and less serious when the procedure is performed via the radial artery. Allergic reaction to the contrast dye used is possible, but has been reduced with the newer agents (31).Death, stroke, ventricular fibrillation (non-sustained ventricular tachycardia is common), myocardial infarction (heart attack, MI), and aortic dissection are the most serious risks of streptokinase use.

During or shortly after the procedure, heart attack occurs in 0.3% of cases; this may require emergency coronary artery bypass surgery (32). Heart muscle injury characterized by elevated levels of CK-MB, troponin I, and troponin T may occur in up to 30% of all PCI procedures. Elevated enzymes have been associated with later clinical outcomes such as higher risk of death, subsequent MI, and need for repeat revascularization procedures (16, 33).

People aged 65 and older, People who have kidney disease or diabetes, Women, People who have poor pumping function in their hearts and People who have extensive heart disease and blockages are more at risk for adverse effects of primary PCI (34).

Procedure of primary PCI: The term balloon angioplasty is commonly used to describe percutaneous coronary intervention, which describes the inflation of a balloon within the coronary artery to crush the plaque into the walls of the artery, but balloon angioplasty is still done as a part of nearly all percutaneous coronary interventions, it is rarely the only procedure performed. Angioplasty is done by team made up of physicians, physician assistants, nurse practitioners, nurses, radiographers, cardiac perfusion stand endovascular specialists; all of whom have extensive and specialized training in these types of procedures (35).

Access into the femoral artery in the leg (or, less commonly, into the radial artery or brachial artery in the arm) is created by a device called an "introducer needle". This procedure is often termed percutaneous access. A "sheath introducer" is placed in the opening to keep the artery open and control bleeding after the access into the artery is gained. Through this sheath a "guiding catheter" (a long, flexible, soft plastic tube) is pushed.

The tip of the guiding catheter is placed at the mouth of the coronary artery. The guiding catheter also allows for radio-opaque dyes (usually iodine-based) to be injected into the coronary artery, so that the disease state and location can be readily assessed using real time X-ray visualization. During the X-ray visualization, the cardiologist estimates the size of the coronary artery and selects the type of balloon catheter and coronary guide wire that will be used during the case. Heparin is given to maintain blood flow. Bivalirudin when used instead of heparin has a higher rate of myocardial infarction but lower rates of bleeding (36).

An extremely thin wire with a radio-opaque flexible tip called coronary guide wire, is inserted through the guiding catheter and into the coronary artery. While visualizing again by real-time X-ray imaging, the cardiologist guides the wire through the coronary artery to the site of the stenosis or blockage.

The tip of the wire is then passed across the blockage. The cardiologist controls the movement and direction of the guide wire by gently manipulating the end that sits outside the patient through twisting of the guide wire. It now acts as the pathway to the stenosis, while the guide wire is in place. The tip of the angioplasty or balloon catheter is hollow and is then inserted at the back of the guidewire thus the guidewire is now inside of the angioplasty catheter.

The angioplasty catheter is gently pushed forward, until the deflated balloon is inside of the blockage. The balloon is then inflated, and it compresses the atheromatous plaque and stretches the artery wall to expand. If a stent was on the balloon, then it will be implanted (left behind) to support the new stretched open position of the artery from the inside (35).

Comparison between the streptokinase and primary PCI:

According to the current guidelines, PPCI is the gold standard for the treatment of STEMI patients(37, 38). PPCI is defined as the PCI in the setting of STEMI, without previous fibrinolysis, and it is indicated in all patients with STEMI in the first 12 hours from symptom onset. Compared to fibrinolysis, PPCI results in higher rates of infarct-related artery patency, higher rates of myocardial blush and lower rates of complications, such as recurrent ischemia, reinfarction, emergency repeat revascularization procedures, intracranial haemorrhage or death(39). After revascularization with PPCI, STEMI patients require a special management.

Although the last decades provided tremendous advance in the management of STEMI, the mortality is still high and the management is very expensive .(40).

So present study is to compare between the outcomes of streptokinase and primary percutaneous coronary intervention in acute myocardial infarction patients to minimize the death rates in MI patients. It’s may be a mile stone for the health care takers who were dealing with those suffering with MI and to evaluate the adverse effects of both to conclude which one was best to use in emergency MI cases.

Material and Methods:

This cross-sectional study was conducted and completed in cardiac department of Gulab Devi Chest Hospital Lahore for six months on two groups:

Group A	Group B
Patients of Primary PCI	Patients of SK

Patients from both groups who participated in the study were 100. Non–probability Purposive Sampling technique was used to collect data. Both Male and Female patients with MI in cardiac department of Gulab Devi hospital and having treatment either streptokinase or primary PCI were included in this study.

Data Collection Methodology: Data was collected from the cardiac department of the Gulab Devi chest hospital. Patients having Myocardial Infarction and had gone through procedure of Primary PCI and Streptokinase were selected in non-random way. A performa was designed to record the data of patients of PPCI and SK .We had seen the risk factors of patients ,from which procedure they had gone through either it was PPCI and SK ,st elevation on ecg also recorded before procedure(PPCI or SK) ,after 90 minutes of procedure(PPCI or SK) and after 180 minutes of procedure(PPCI or SK), complications after procedure also recorded, ejection fraction recorded with the help of echocardiography to see the cardiogenic shock and acute LVF, renal function test was done to see the renal failure ,the results were recorded carefully and complete monitorization was done to see the arrhythmias after procedure.

Data Analysis Technique: Data was analysed by using SPSS version 16.0. The qualitative data were presented in the form of graphs and tables along with its percentages. The quantitative data were presented in the form of mean, range and standard deviation by simple descriptive analysis.

Operational Definitions:

Acute coronary artery disease: Impedance or blockage of one or more arteries that supply blood to the heart, usually due to atherosclerosis (hardening of the arteries). A major cause of illness and death, CAD begins when hard cholesterol substances (plaques) are deposited within a coronary artery.

Myocardial Infarction: Myocardial infarction commonly known as a heart attack occurs when blood flow decreases or stops to a part of the heart, causing damage to the heart muscle.

MI death of the cells of an area of the heart muscle (myocardium) as a result of oxygend eprivation, which in turn is caused by obstru ction of the blood supply; commonly referre d to as a "heart attack."

Streptokinase: Streptokinase (SK) is a thrombolytic medication and enzyme. As a medication it is used to break down clots in some cases of myocardial infarction (heart attack), pulmonary embolism, and arterial thromboembolism. The type of heart attack it is used in is an ST elevation myocardial infarction (STEMI). It is used by injection into a vein.

Primary PCI: Percutaneous coronary intervention (PCI) is a non-surgical procedure used to treat narrowing (stenosis) of the coronary arteries of the heart.

Results:

The mean age of patients was 51.02± 10.95 years with minimum and maximum age as 28 and 75 years. In this study, out of total 100 patients, 22 (22.00%) were female patients and 78 (78.00%) were males. Male gender predominated in this study.

In this study 30 (30.00%) patients were with positive smoking history and 70 (70.00%)

were non-smokers. In this study 40(40.00%) patients were hypertensive and 60(60.00%) were non-hypertensive. In this study 24 (24.00%) patients had positive family history of MI and 76(76.00%) patients had no family history. In this study 21 (21.00%) patients were diabetics and 79 (79.00%) were non-diabetic. In this study, risk of myocardial Infarction in patients with hyperlipemia were 2 (2.00%) and risk of myocardial infarction in patients with no hyperlipidaemia were 98 (98.00%). In this study 2 (2.00%) patients there were obese and 98 (98.00%) were non-obese.

In this study 31 (31.00%) patients had inferior wall MI, 27 (27.00%) patients had anterior wall MI, 1 (1.00%) patients had high lateral wall MI, 9 (9.00%) patients with anteroseptal wall MI, 5 (5.00%) patients had inferior wall MI, 8 (8.00%) patients had inferoseptal wall MI, 17 (17.00%) patients had anterolateral wall mi and 2 (2.00%) patients had extensive anterior wall MI. (**Figure** 1)

In this study, 53 (53.00%) patients were received streptokinase therapy and 47 (47.00%) patients had primary PCI procedure.

In this study p-value was.000 (<0.05) its means that primary PCI is better than streptokinase. There were more chances (67.00%) of acute LVF in streptokinase and less chances (21.00%) in primary PCI. (Table 1)

In this study, p-value was.000 (<0.05) its means that primary PCI was better than streptokinase. There were more chances (67.00%) of cardiogenic shock in streptokinase and less chances (21.00%) in primary PCI. **Table 2**

In this study, p-value was 0.530 (>0.05) so there were equal chances of stroke in streptokinase and primary PCI. **Table** 3

In this study, p-value was .000(<0.05) so there were more chances (28.00%) of bleeding from any site in streptokinase and less chances (0%) in primary PCI. (**Table** 4)

In this study, p-value was .000(<0.05) so there were chances (24.00%) of renal failure in streptokinase and less chances (0%) in primary PCI. (**Table** 5)

In this study, p-value was 0.05 (0.05%) so there were more chances (9.43%) of rescue PCI in streptokinase and less chances in primary PCI. (**Table** 6)

In this study, p-value was .000 (<0.05%) so there were more chances of arrhythmias (26.41%) in streptokinase patients and less chances in primary PCI. (**Table** 7)

In this study, p-value was 0.05 (0.05%) so there were more chances of death (1.92%) in streptokinase and less chance in primary PCI. (**Table** 8)

Discussion:

Primary PCI is an acceptable alternative to thrombolytic therapy in patients with acute MI and may result in superior outcomes in select patient populations, especially the elderly, patients with prior coronary artery bypass surgery, those with congestive heart failure, and those in cardiogenic shock.

This was the descriptive study conducted at Gulab Devi Hospital Lahore. Minimum age of the patient in this study was 28 years and maximum age was 78 years. The mean age was 51.02± 10.95 and standard deviation was 10.956 years. In this study, there were total 100 patients. Out of total 100 patients, 22 (22.00%) were female patients and 78 (78.00%) were males. Male gender

predominated in this study. In this study 30 (30.00%) patients were with positive smoking history and 70 (70.00%) were non-smokers. 40(40.00%) patients were hypertensive and 60 (60.00%) were non-hypertensive. In this study 24 (24.00%) patients had family history positive and 76 (76.00%) patients had no family history.

In this study, 21 (21.00%) patients were diabetics and 79 (79.00%) were non-diabetic. In this study of risk of myocardial Infarction in patients with hyperlipemia were 2 (2.00%) and risk of myocardial infarction in patients with no hyperlipidaemia were 98(98.00%). In this study, 2 (2.00%) patients there were obese and 98 (98.00%) were non-obese. In this study, 31 (31.00%) patients had inferior wall MI, 27 (27.00%) patients had anterior wall MI, 1 (1.00%) patients had high lateral wall MI, 9 (9.00%) patients with anteroseptal wall MI, 5 (5.00%) patients had inferior wall MI, 8 (8.00%) patients had inferoseptal wall MI, 17 (17.00%) patients had anterolateral wall MI and 2 (2.00%) patients had extensive anterior wall MI.

In this study, 53 (53.00%) patients were received streptokinase therapy and 47(47.00%) patients had primary PCI procedure. According to my results, primary PCI was better than streptokinase. There were more chances (67.00%) of acute LVF in streptokinase and less chances (21.00%) in primary PCI. According to this study, there were more chances (67.00%) of cardiogenic shock in streptokinase and less chances (21.00%) in primary PCI. In this study there were equal chances of stroke in streptokinase and primary PCI. In this study, there were more chances (28.00%) of bleeding from any site in streptokinase and less chances (0%) in primary PCI. According to results there were chances (24.00%) of renal failure in streptokinase and less chances (0%) in primary PCI.

There were more chances (9.43%) of rescue PCI in streptokinase and less chances in primary PCI. In this study, there were more chances of arrhythmias (26.41%) in streptokinase patients and less chances in primary PCI. In this study, there were also more chances of death (1.92%) in streptokinase and less chance in primary PCI. So according to this study primary PCI was better than streptokinase with less complications.

The similar study showed that Primary PTCA was better than thrombolytic therapy at reducing overall short-term death (7% [n=270] *vs* 9% [360]; p=0·0002), death excluding the SHOCK trial data (5% [199] *vs* 7% [276]; p=0·0003), non-fatal reinfarction (3% [80] *vs* 7% [222]; p<0·0001), stroke (1% [30] *vs* 2% [64]; p=0·0004), and the combined endpoint of death, non-fatal reinfarction, and stroke (8% [253] *vs* 14% [442]; p<0·0001). The results seen with primary PTCA remained better than those seen with thrombolytic therapy during long-term follow-up, and were independent of both the type of thrombolytic agent used, and whether or not the patient was transferred for primary PTCA (39).

Of 6315 patients, 877 (14%) had diabetes. Thirty-day mortality (9.4% vs 5.9%; $P < .001$) was higher in patients with diabetes. Mortality was lower after primary PCI compared with fibrinolysis in both patients with diabetes (unadjusted odds ratio, 0.49; 95% confidence interval, 0.31-0.79; $P = .004$) and without diabetes

(unadjusted odds ratio, 0.69; 95% confidence interval, 0.54-0.86, *P* = .001), with no evidence of heterogeneity of treatment effect (*P* = .24 for interaction). Recurrent infarction and stroke were also reduced after primary PCI in both patient groups. After multivariable analysis, primary PCI was associated with decreased 30-day mortality in patients with and without diabetes, with a point estimate of greater benefit in diabetic patients (41).

Another study was conducted in the city of Mangalore, a city on the west coast of South India. A total of 100 patients admitted with AMI who were thrombolysed with streptokinase were recruited of which 26 were female and 74 were male. 63 patients had failed thrombolysis with streptokinase compared to 37 patients who had a successful thrombolysis (p = 0.036) Patients with Anterior Wall MI (AWMI) had the highest rate of failure of thrombolysis (43, 68.3%) followed by Inferior Wall Myocardial Infarction (IWMI) (14, 22.2%). The mean symptom needle time in patients with failed and successful thrombolysis was 7.95 hours and 3.03 hours respectively (t test 11.95 P <0.001). 35 (55.6%) patients among the failed group had DM (OR 2.6, CI 1.16) (x2 = 5.003 P = 0.025). 61% of our study population were smokers and among this 69.8% failed thrombolysis with streptokinase.

Current study had several limitations. Firstly, the sample size was small. However, study of a large population would not significantly alter the outcomes of primary PCI and streptokinase. Secondly, this study was conducted at a single institution in an area of intermediate primary PCI and streptokinase burden which may limit the applications of our finding in areas of differing primary PCI and streptokinase prevalence.

Conclusion:

Primary PCI was better than streptokinase to cure the myocardial infarction and better to minimize the complications after procedure. In all acute STEMI patients, left ventricular function is better preserved, when treated with primary PCI compared to treatment with SK. In acute anterior STEMI patients treated with primary PCI, the additional mortality benefit during long-term follow is due to better preserved residual left ventricular function. To benefit from these findings and offer a transfer for primary PCI service, healthcare systems need to consolidate and organize rapid, safe ambulance networks, and, if possible, early pharmacologic facilitation, in addition to PCI centers able to meet with the demand.

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Table 1. Comparison of Sterptokinase and Primary PCI induced acute LVF

		Acute LVF		
		Yes	No	Total
Procedure	Streptokinase	36	17	53
	primary PCI	10	37	47
Total		46	54	100

Chi-square value =21.82
p-value=.000

Table 2. Comparison of Streptokinase and Primary PCI induced cardiogenic shock

		Cardiogenic shock		
		Yes	No	Total
Procedure	Streptokinase	15	38	53
	primary PCI	3	44	47
Total		18	82	100

Chi-square value =8.108
p-value=.008

Table 3. Comparison of Streptokinase and Primary PCI induced stroke

		Stroke		
		No	22	Total
Procedure	Streptokinase	52	1	53
	primary PCI	47	0	47
Total		99	1	100

Chi-square value =.896
p-value=.530

Table 4. Comparison of Streptokinase and Primary PCI induced bleeding

		Bleeding from any site			
		Yes	No	22	Total
Procedure	Streptokinase	15	37	1	53
	primary PCI	0	47	0	47
Total		15	84	1	100

Chi-square value=16.89
p-value=.000

Table 5. Comparison of Streptokinase and Primary PCI induced renal failure

		Renal failure		
		Yes	No	Total
Procedure	Streptokinase	13	40	53
	primary PCI	0	47	47
Total		13	87	100

Chi-square =13.25
p-value =.000

Table 6. Chances of rescue PCI in Streptokinase and PCI

		Rescue PCI		
		Yes	No	Total
Procedure	Streptokinase	5	48	53
	primary PCI	0	47	47
Total		5	95	100

Chi-square value =4.66
p-value=0.05

Table 7. Comparison of Streptokinase and Primary PCI induced arrythmias

		Arrhythmias			
		Yes	No	22	Total
Procedure	Streptokinase	14	39	0	53
	primary PCI	0	46	1	47
Total		14	85	1	100

Chi square value=15.27
p-value=.000

Table 8. Comparison of chances of death in Streptokinase and PCI interventions

		Death		
		Yes	No	Total
Procedure	Streptokinase	1	52	53
	primary PCI	0	47	47
Total		1	99	100

Chai –sequre value=4.66
p-value=0.05

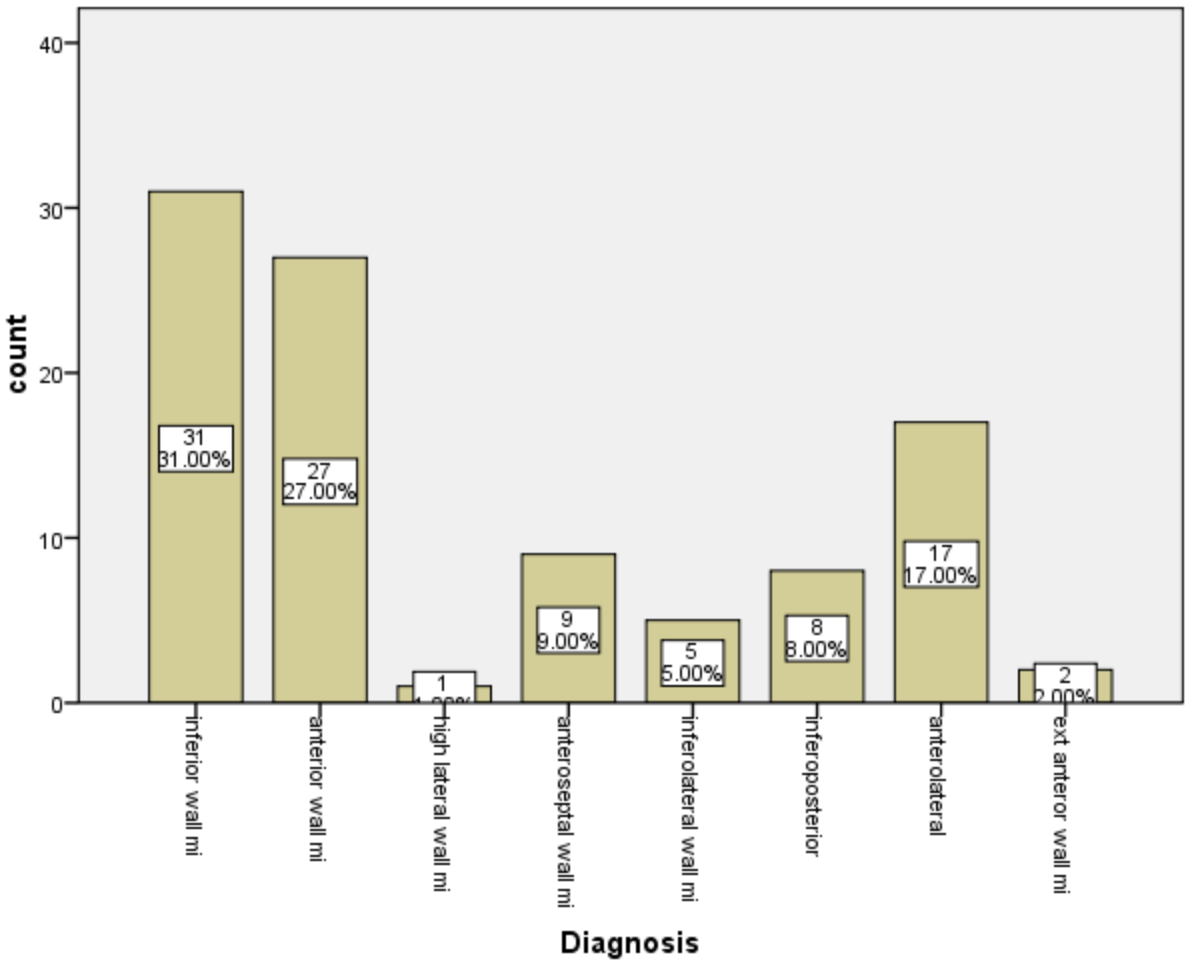

Figure 1. Diagnosis distribution among patients

Comparison between the outcomes of Sk and PPCI in acute Myocardial Infarction

Performa

Name _____ Age_____ Gender_____
*Reg No*_____ Date_____ Diagnosis_____ Procedure_____

Risk factors	Yes	No
Smoking		
HTN		
FH		
DM		
Hyperlipidemia		
Obesity		

ST segment Before Sk/PPCI _____ After 90 mints (Sk/PPCI) _____ After 180 mints (Sk/PPCI) _____

St segment	After 90 mints	After 180 mints
No resolution		
Partial resolution		
Complete resolution		

Complications	Yes	No
Acute LVF		
Cardiogenic shock		
Stroke		
Cardiac tamponade		

Bleeding from any site		
Renal failure		
Rescue PCI		
Arrythmias		
Death		

Date ---------- Investigator ----------

Informed Consent

Miss Zarnab Tariq has informed me about the research project on Comparison between the outcomes of Sk and PPCI in acute Myocardial Infarction, I am willing to participate in its research project, moreover. I am agreed and give her permission to take data for research purpose only.

Patient /Guardian Signature Researcher Signature