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THE ASSESSMENT OF EFFICACY OF LATE THROMBOLYSIS IN ACUTE MYOCARDIAL INFARCTION

Cardiology

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ABSTRACT

Background: Thrombolytic therapy is effective when given as early as possible after acute myocardial infarction (AMI). However, greater than 30% of AMI patients will come to hospital 6 hours after the onset of their first symptom i.e., later than the usual time window for administration of thrombolytic therapy. Thus, extension of this time window to patient presenting up to 24 hours after the symptom onset will make such therapy available to more patients.

Objective: To assess the efficacy of late thrombolysis (7-24 hours) in AMI patients with regard to relief of symptoms, rapid ST-elevation resolution on treatment, mortality and left ventricular function, in-hospital and on 1 month, 6 months and 1 year follow-up. To compare the late thrombolyzed group with early thrombolyzed and non-thrombolyzed group.

Method: A total of 159 consecutive patients at their first episode of AMI presenting within 24 hours from the chest pain onset are included in the study. Once diagnosis of STEMI made and thrombolytic therapy was given, all patients were categorized into 4 groups. First 3 groups received thrombolytic therapy with 1.5 million IU of streptokinase in 100 ml of normal saline over 45 minutes, categorized on duration from onset of chest pain to administration of thrombolytic therapy and the fourth group included non-thrombolyzed patients.

Group-I 0 to 6 hours (74 patients) – 46.50%
Group-II 7 to 12 hours (38 patients) – 23.90%
Group-III 13 to 24 hours (18 patients) – 11.30%
Group-IV Non-thrombolyzed group (28 patients) – 18.20%
Thus, 56 patients (35.2%) belonged to late thrombolyzed group (7-24 hours)

In-hospital complications and mortality were followed up in all patients, left ventricular function was assessed by 2D Echo before discharge. Patients who survived initial hospitalization were followed up for mortality and left ventricular function at 1 month, 6 months and 1 year during the study period.

Results: After thrombolytic therapy, rapid relief in chest pain was noted in 49 patients (66.21%) of 0-6 hours, 18 patients (47.36%) of 7-12 hours and 6 patients (33.33%) of 13-24 hours group and 7 patients (24.13%) in the non-thrombolyzed group after routine coronary care treatment. Rapid resolution of ST elevation was seen in 36 patients (48.64%) of 0-6 hours, 13 patients (34.2%) of 7-12 hours, 4 patients (22.22%) of 13-24 hours and 5 patients of non-thrombolyzed (17.24%).

Persistent hypotension, left ventricular failure, cardiogenic shock, asystole, complete heart block occurred less in late thrombolyzed group compared to non-thrombolyzed group except for ventricular tachycardia. Cardiogenic shock and ventricular tachycardia occurred more frequently in early thrombolyzed group than late thrombolyzed group.

In-hospital mortality was 11 (14.86%) in 0-6 hours, 2 (5.26%) in 7-12 hours, 5 (27.77%) in 13-24 hours and 7 (12.5%) in combined late thrombolyzed group (7-24 hours) as compared to 7 deaths (24.3%) in non-thrombolyzed group.

Regional wall motion abnormality, systolic dysfunction of left ventricle occurred less in late thrombolyzed group as compared to non-thrombolyzed group but was more than early group. No statistically significant difference in ejection fraction was noted in any of the group before discharge. One month follow up was done in 110 patients out of 134 patients who survived initial hospitalization. There was 1 death in 0-6 hours group, 1 in 13-24 hours group and 1 in non-thrombolyzed group. At 6 months, 93 out of 99 patients were followed up. There were 2 deaths each in 7-12 hours group and non-thrombolyzed group. At 1 year, 40 out of 48 patients were followed up. There was 1 death in 7-12 hour group. Mortality and left ventricular function could not be compared between any of the groups on follow up as the number of patients differed because some of the patients from each group did not turn up for follow-up.

Conclusion: Though thrombolytic therapy is most effective when given early, late treatment is also beneficial. Efforts should continue to administer thrombolytic therapy at the earliest possible and treatment should not be denied in those who presented late.

KEYWORDS

Acute myocardial infarction; Thrombolytic therapy.

INTRODUCTION

Heart disease is the leading cause of death in many parts of the world, though once thought as disease of men, it is significantly affecting women second only to cancer[1]. Coronary heart disease is the most common type of heart disease, killing 365,914 people in 2017[2].

At the beginning of the 20th century, 10% of all deaths worldwide were caused by cardiovascular disease. At the beginning of the 21st century, they accounted for almost half of all deaths in the developed world and a quarter of all deaths in the developing world. It is predicted that the disease will claim 25 million lives annually and the coronary heart disease (CHD) will surpass infectious diseases as the world's number one cause of death and disability by 2020[3].

Streptokinase is FDA approved in the treatment of acute ST-segment elevation myocardial infarction, arterial thrombosis or embolism, deep vein thrombosis, pulmonary embolism, and arteriovenous cannula occlusion[4]

No mortality benefit was observed in LATE and EMERAS trials when fibrinolytics were routinely administered between 12-24 hrs, although it is still reasonable when PCI is not available[5].

Acute STEMI affects 30% to 50% of patients presenting with an acute coronary syndrome (ACS) who require immediate reperfusion therapy[6], whether accomplished by mechanical or pharmacologic means. Early coronary artery revascularization salvages ischemic myocardium, improves function of left ventricle and prolongs survival of the patient[7].

Because of its universal and rapid availability, intravenous thrombolytic therapy had remained the mainstay of reperfusion therapy. Thrombolytic therapy of evolving myocardial infarction was based on the concept that severely ischemic myocardium can be salvaged by reperfusion of reversibly injured tissue. The earlier the reperfusion is achieved, more limited the myocardial damage and more reduction in mortality.[8]

The potential value of the late administration of thrombolytic therapy in patients with acute myocardial infarction is highly controversial. A meta-analysis of intravenous thrombolytic trials with registries has indicated that more than 30% of patients with myocardial infarction present for medical care between 6 and 24 hours after symptom onset[9].

The mechanism other than left ventricular salvage has been postulated to account for the apparently salutary effect of late reperfusion. These include a reduction in the formation of left ventricular aneurysms, a reduction in ventricular electrical instability and potentially lethal ventricular arrhythmias, a reduction in the incidence of left ventricular

thrombus formation, and the provision of a conduit for collateral flow in the event of subsequent contralateral vessel occlusion[9].

In LATE trail they concluded that extended thrombolysis upto 12hrs with alteplase is beneficial but for those treated between 12-24hrs, subgroup analysis suggests that some patients may benefit[10], but no established evidence.

The value of late thrombolysis even though uncertain, the issue is important. As extension of time window for thrombolytic therapy would make such therapy available to more patients.

Hence, this study is undertaken to evaluate the potential value of delayed thrombolysis on left ventricular function and overall mortality in acute myocardial infarction.

METHODOLOGY

The study was carried out in Government General Hospital attached to Kurnool Medical College, kurnool. A total number of 159 consecutive patients who were admitted to ICCU from march 2019 to December 2019 with first episode of acute myocardial infarction were studied.

Study Subject:

Patients of either sex admitted within 24 hours from onset of chest pain of suspected ischemic origin and ECG showing STEMI i.e., ST-segment elevation in two or more contiguous leads that is greater than or equal to 0.1 mV (exceptions are posterior MI defined as ST-segment depression of ≥ 0.1 mV in V_1 and V_2) or new onset left bundle branch block with or without elevated cardiac enzymes.

Exclusion Criteria:

- Patients with history of previous myocardial infarction.
- Patients presenting >24 hours after the onset of chest pain.

After thorough history and clinical examination, all routine investigations were done.

Investigations include hemoglobin, total count, differential count, erythrocyte sedimentation rate, random blood sugar, fasting lipid profile, blood urea, serum creatinine, ECG, serum CK-MB &2D echo.

Once the patient was diagnosed to have acute STEMI and received treatment, they were categorized into 4 groups. Initial 3 groups constituted patients who received thrombolytic therapy i.e., intravenous streptokinase 1.5 million units over 45 minutes in 100 ml normal saline within 24 hours of onset of chest pain, categorized based on time from onset of chest pain to institution of intravenous streptokinase. The last group constituted patients who did not receive thrombolytic therapy

Group-I < 6 hours of onset of chest pain
Group-II 7 to 12 hours of chest pain
Group-III 13 to 24 hours of chest pain
Group-IV Non-thrombolysed group.

- All the patients received routine coronary care treatment.
- After thrombolytic therapy effect on symptom and ECG changes of reperfusion noted.
- Patients were followed up in hospital for complication and mortality. At the time of discharge, 2D echo was done to know left ventricular function.
- All patients were followed up at 1 month, 6 months and 1 year duration for left ventricular function and mortality.
- All the data were statistically analyzed using Chi-square and ANOVA

RESULTS

Table-1: Distribution Of Cases According To Duration From Chest Pain To Hospital Admission In Hours

Duration (hours)	No. of Cases	Percentage
0 – 6 hrs	88	55.34
7 – 12 hrs	44	27.67
13 – 24 hrs	27	16.98
Total	159	100.00

Table-2: Distribution Of Cases According To Thrombolytic Therapy

Group	No. of Cases	Percentage
Thrombolyzed	130	81.76
Non-thrombolyzed	29	18.24
Total	159	100.00

Table-3: Distribution Of Cases According To Duration From Onset Of Chest Pain To Institution Of Thrombolytic Therapy In Hours

Duration (hours)	No. of Cases	Percentage
0 – 6 hrs	74	46.50
7 – 12 hrs	38	23.90
13 – 24 hrs	18	11.30
Non-thrombolyzed	29	18.20
Total	159	100.00

Out of 130 patient who received thrombolytic therapy, 74 patient (46.5%) were thrombolyzed between 0-6 hours from onset of chest pain i.e., early thrombolyzed, 38 patients (23.9%) between 7-12 hours, 18 patients(11.3%) between 13-24 hours from pain onset as shown in table3. Thus 56 patients (35.2%) were late thrombolyzed i.e., 7-24 hours.29 patients belonged to the non-thrombolyzed group out of total 159 patients (9 admitted within 0-6 hours, 9 patients between 7-12 hours and 11 patients within 13-24 hours from onset of chest pain).

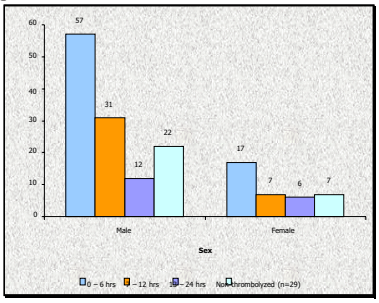

Figure 1: Distribution Of Cases According To Duration From Onset Of Chest Pain To Thrombolytic Therapy And Sex

Table-4: Distribution Of Cases According To Site Of MI

Site of MI	Group								Total	
	0 – 6 hrs		7 – 12 hrs		13 – 24 hrs		Non-thrombolyzed			
	No.	%	No.	%	No.	%	No.	%	No.	%
Anterior wall MI	44	59.5	27	71.1	7	38.9	22	75.9	100	62.9
Inferior wall MI	25	33.8	9	23.7	8	44.4	5	17.2	47	29.60
Inferior wall + Right ventricular MI	5	6.8	2	5.3	2	11.1	2	6.9	11	6.9
Global MI	--	--	--	--	1	5.6	--	--	1	0.6
Total	74	100.0	38	100.0	18	100.0	29	100.0	159	100.0

X^2=15.138 df=9 p=0.087

Out of 159 patients, anterior wall MI was present in 100 patients (62.9%), inferior wall MI in 47 patients (29.6%), inferior wall with right ventricular MI in 11 patients (6.9%) and 1 patient (0.6) had global MI as depicted in the above table 4.

Table-5: Distribution Of Cases According To Decrease In Chest Pain After Treatment

Group	Features of Reperfusion – Decreased chest pain					
	Yes		No		Total	
	No.	Percent	No.	Percent	No.	Percent
Thrombolyzed (n=130)						
0 – 6 hrs	49	66.21	25	33.78	74	100.00
7 – 12 hrs	18	47.36	20	52.63	38	100.00
13 – 24 hrs	6	33.33	12	66.66	18	100.00
Non-thrombolyzed (n=29)	7	24.13	22	75.86	29	100.00
Total	80	50.30	79	49.70	159	100.00

X^2=18.366 df=3 p=0.000 (2 sided)

Immediate symptomatic reduction in chest pain is seen in 49 patients (66.2%) of 0-6 hours group, 18 patients (47.36%) of 7-12 hours group

and 6 patients (33.33%) of 13-24 hours group. In non-thrombolyzed group 7 patients (24.13%) had decrease in chest pain with routine coronary care treatment as shown in the table 5.

Table-6: Distribution Of Cases According To Resolution Of St Segment Elevation After Treatment

Group	Features of Reperfusion - Resolution of ST Elevation					
	Yes		No		Total	
	No.	Percent	No.	Percent	No.	Percent
Thrombolyzed (n=130)						
0 – 6 hrs	36	48.64	38	51.35	74	100.00
7 – 12 hrs	13	34.21	25	65.78	38	100.00
13 – 24 hrs	4	22.22	14	77.17	18	100.00
Non-thrombolyzed (n=29)	5	17.24	24	82.75	29	100.00
Total	58	36.47	101	63.82	159	100.00

X^2=10.50 df=3 p=0.015 (2 sided)

Rapid resolution of ST elevation after treatment was observed in 36 patients (48.64%) of 0-6 hours group, 13 patients (34.21%) of 7-12 hours and 4 patients (22.22%) in 13-24 hours group. Whereas in the non-thrombolyzed group, ST elevation resolution was observed only in 5 patients (17.24%) as depicted in the above table 6.

Table-7: Distribution Of Cases According To In-hospital Complications

Complications	Group				Total	Percent
	0 – 6 hr	7 – 12 hr	13 – 24 hr	Non-thrombolyzed		
Reinfarction	--	1	--	--	1	0.62
Post MI angina	--	--	1	2	3	1.88
Persistent hypotension	2	1	1	2	6	3.77
Cardiogenic shock	9	1	1	7	18	11.32
Left ventricular failure	4	2	1	5	12	7.54
Ventricular tachycardia	8	3	3	1	15	9.43
Supraventricular tachycardia	2	--	--	--	2	1.25
Atrial fibrillation	1	--	--	--	1	0.62
Complete heart block	3	1	2	2	8	5.03
Asystole	2	1	1	2	6	3.77
Acute renal failure	1	–	--	1	2	1.25
Ischemic stroke	1	--	1	1	3	1.88
Hemorrhagic stroke	1	--	--	--	1	0.76
Cardiac rupture	--	--	--	--	--	--

Table-8: Distribution Of Cases According To Duration From Onset Of Chest Pain To Thrombolytic Therapy And In-hospital Mortality

Group	No. of Cases	Percentage
0 – 6 hrs	11	14.86
7 – 12 hrs	2	5.26
13 – 24 hrs	5	27.77
Non-thrombolyzed	7	24.13

Table-9: Relationship Between Duration From Onset Of Chest Pain To Thrombolytic Therapy And Before Discharge 2D Echo

2D Echo	Group							
	0 – 6 hrs (n=63)		7 – 12 hrs (n=36)		13 – 24 hrs (n=13)		Non-thrombolyzed (n=22)	
	No.	%	No.	%	No.	%	No.	%
Normal	8	12.69	--	--	--	--	--	--
RWMA	53	84.12	35	97.20	13	100.0	22	100.0
LVDD	25	39.68	7	19.44	4	30.76	7	31.81
LVSD	28	44.44	19	52.77	8	61.53	14	63.63
EF	50.31±10.27		46.29±9.80		46.23±9.20		46.50±9.23	

df=1.811 p=0.148

Table-10: Clinical & Biochemical Parameters Of The Patients

Parameters	0 – 6 hrs	7 – 12 hrs	13 – 24 hrs	Non-thrombolyzed	d f - value	p
Systolic BP	127.17± 29.30	123.46± 26.76	125.63± 33.05	125.63± 33.05	0.118	0.998
Diastolic BP	84.77± 16.99	80.0± 11.88	78.75± 15.00	81.71± 18.92	1.020	0.386
Random blood sugar	138.74± 46.19	136.0± 43.97	135.72± 55.79	154.57± 77.78	0.780	0.502
Serum creatinine	0.93± 0.22	0.91± 0.21	1.0±0.3 7	1.07± 0.31	2.67	0.050
CPK-MB	67.71± 76.94	62.53± 44.20	83.56± 48.95	122.89± 76.22	5.541	0.001

DISCUSSION

A hospital based study was done to know whether thrombolytic therapy administered late (7-24 hours of chest pain) has any benefit over mortality and left ventricular function at in hospital, at 1 month, 6 months and 1 year follow-up. This late thrombolyzed patients were compared with early thrombolyzed (0-6 hours) and non-thrombolyzed group. A total of 159 patients were included in this study with clinical and biochemical parameters of patients as mentioned in table 10.

In the present study, 88 patients (55.34%) presented <6 hours of symptoms as compared to 71 patients (44.69%) who presented after 6 hours of symptom onset (table 1).

Out of 159 patients, 130 patients (81.76%) received thrombolytic therapy and 29 patients (18.2%) did not receive thrombolytic therapy(table 2).

In our study, the incidence of AMI was maximum in 46 to 55 years age group i.e., 30.8%, followed by 56-65 years age group i.e., 24.57%.

David WM Muller and Eric J Topol in their meta-analysis of intravenous thrombolytic trial has shown that 10%-27% of AMI patients are >75 years old. In the present study 7.54% of the patients were >75 years old[9].

In the study conducted by Cordioli E et al[11] 62% of patients received fibrinolytic therapy and 38% did not receive thrombolytic therapy. In our study, 81.76% received thrombolytic therapy and 18.2% were non-thrombolyzed.

Decades of observational studies have verified excess MI risk in men compared with women. In Kanitzet al[12] study, 81% were males and 19% were female.

In the present study 76.7% of acute myocardial infarction patients were male and 23.3% were female(figure1).out of them, 81% were thrombolysed and successful reperfusion was seen in 57% which is more when compared to that of males. A couple of theories could explain this, one being women having uniform fibrin rich clots which provides high affinity for thrombolytics and the second being influence of estrogen on fibrinolytic system which favours faster and complete recanalization[13]. At 1m, 6m, 1 year follow up there is no significant differences among both sexes which is consistent with the previous studies.

Atherosclerosis in both sexes and at all ages is accelerated in smokers and and smoking further increases the risk of thrombosis, plaque vulnerability, myocardial infarction and death. In Tanajura et al[14] study, the prevalence of smoking was 81%.

A wealth of epidemiologic data support a relationship between hypertension and atherosclerotic heart disease, more recent studies also show a reduction in CHD, risk by antihypertensive therapy. In Tanajura et al[14] study, the prevalence of hypertension was 22%.

One of the best understood and most firmly established risk factors for AMI being abnormal plasma lipoprotein levels and deranged lipid metabolism. In Tanajura et al[11] study, the prevalence of dyslipidemia was 16%.

Diabetes mellitus is a chronic heart disease risk equivalent. Most diabetic patients die of atherosclerosis and its complications. In Tanajaru et al[14], the prevalence of diabetes mellitus was 4%.In the present study, the prevalence of smoking was 69.8% followed by

dyslipidemia in 38.36%, diabetes mellitus in 20.12%, hypertension in 11.32%, obesity in 18.23% and all female patients were in postmenopausal status.

In the GISSI-I trial[15] 37% of patients had anterior wall MI, 34% had inferior wall MI. In our study, 62.9% had anterior wall MI, 29.6% had inferior wall MI.

After thrombolytic therapy rapid relief in chest pain was observed in 66.2% of 0-6 hours group, 47.36% of 7-12 hours, 33.33% in 13-24 hours group. Symptomatic relief in chest pain was seen 24.1% of non-thrombolyzed group after routine coronary care treatment. But it was not statistically significant in any of the groups(table 5).

Rapid resolution of ST-elevation was seen in 48.64% of 0-6 hours group, 34.2%, 22.22% and 17.24% of 7-12 hours, 13-24 hours and non-thrombolyzed group respectively, but was not statistically significant(table 6).

Reinfarction occurred in 1 patient (2.63%) in 7-12 hours group, post MI angina occurred in 1 patient (5.55%) of 13-24 hours group, 2 patients (6.89%) of non-thrombolyzed group.

Persistent hypotension was present in 2.7% of 0-6 hours, 2.63% of 7-12 hours, 5.55% of 13-24 hours group, 3.57% of 7-24 hours group combined and 6.89% of non-thrombolyzed group.

Cardiogenic shock occurred in 12.66% of 0-6 hours, 2.6% in 7-12 hours, 5.5% in 13-24 hours, 3.5% of 7-12 hours group combined and 24.13% of non- thrombolyzed group.

Acute LVF occurred in 5.40% of 0-6 hours group, 5.26% of 7-12 hours group, 5.55% of 13-24 hours group, 5.3% of 7-24 hours group combined and 17.24% of the non-thrombolyzed group.

Even though statistically significant difference was not noted in chest pain relief and ST segment resolution in any of the groups, it was observed that percentage of relief of symptom and resolution of ST-segment reduced as the time prolonged and was less in non-thrombolyzed groupVentricular tachycardia occurred in 10.81% of 0-6 hours group, 7.89% of 7-12 hours, 10.7% of 13-24 hours group, 10.7% of 7-24 hours group combined and 3.44% of the non-thrombolyzed group.

Persistent complete heart block occurred in 4.05% of 0-6 hours, 2.63% of 7-12 hours, 11.11% of 13-24 hours, 5.35% of 7-24 hours group combined and 6.89% of non-thrombolyzed group.

Incidence of asystole was 2.70% in 0-6 hours, 2.63% in 7-12 hours group, 5.55% of 13-24 hours group, 3.57% of 7-24 hours group combined and 6.89% in non-thrombolyzed group.

There were 2 cases (2.70%) of SVT and 1 (1.35%) was of atrial fibrillation in 0-6 hours group. 1 patient (1.35%) in 0-6 hours and 1 in (3.44%) of non-thrombolyzed group developed acute renal failure.

1 patient (0.76%) thrombolyzed 0-6 hours developed hemorrhagic stroke, ischemic stroke occurred in 3 patients, 1 (1.35%) of 0-6 hours, 1 (5.55%) of 13-24 hours and 1 patient (3.44%) of non-thrombolyzed group as shown in table 7. Although cardiac rupture either free wall or ventricular septum is a rare complication described, we didn't come across in our study population.

Granger CB et al[16] in their study has shown that incidence of hemorrhagic stroke is 0.5% to 1%. In the present study it was0.76%.

In the present study, in hospital mortality was 14.86% for 0-6 hours group, 5.26% for 7-12 hours group, 27.77% for 13-24 hours, 12.5% for combined 7-24 hours group and 24.13% for non-thrombolyzed group(table 8).

Before discharge, 2D echo (table 9) in survivors of initial hospitalization showed that regional wall motion abnormality was present in 53 patients (84.12%) of 0-6 hours, 35 patients (97.2%) of 7-12 hours, 13 patients (100%) of 13-24 hours and 22 patients (100%) of non-thrombolyzed group. LVDD was present in 25 patients (39.68%) of 0-6 hours, 7 patients (19.44%) of 7-12 hours, 4 patients (30.76%) and 7 patients (31.81%) of non-thrombolyzed group. LVSD was present in 28 patients (44.44%) of 0-6 hours, 19 patients (52.77%) of 7-12 hours, 8 patients (61.53%) of 13-24 hours and 14 patients (63.33%) of non- thrombolyzed group.

Before discharge, mean ejection fraction was better in 0-6 hours group (50.31±10.27). Ejection fraction in 7-12 hours group was 46.29±9.8, in 13-24hours group was 46.23±9.20 and in non-thrombolyzed group, ejection fraction was 46.50±9.73. Thus, there was no statistical significant difference in before discharge ejection fraction noted in any of the group.

The TIMI-I trial in which 290 patients admitted within 7 hours after onset of acute myocardial infarction were randomly assigned to IV streptokinase or rt- PA, ejection fraction did not change significantly from before treatment to before discharge in either treatment group[17].

At 1 month, 110 patients were followed up out of 134 patients who survived initial hospitalization i.e., 51 patients in 0-6 hours, 30 patients in 7-12 hours, 12 patients in 13-24 hours and 17 in non-thrombolyzed group.

There was 1 death in 0-6 hours group, 1 in 13-24 hours and 1 in non-thrombolyzed group.

At 1 month, 6 patients of 0-6 hours group had normal left ventricular function, regional wall motion abnormality was present in 43 patients in 0-6 hours, 30 patients in 7-12 hours, 11 patients in13-24 hours and 16 patients of non-thrombolyzed group. LVDD was present in 23 patients of 0-6 hours, 9 patients of 7-12 hours, 3 patients of 13-24 hours and 6 patients of non- thrombolyzed group. LVSD was present in 19 patients of 0-6 hours, 14 patients of 7-12 hours, 6 patients of 13-24 hours group and 11 patients of non- thrombolyzed group.

The mean ejection fraction in 0-6 hours group was 50.40±9.07 in 7-12 hours group was 47.47±8.34, 13-24 hours group 47.91±6.31 and in non- thrombolyzed group, it was 45.13±7.12.

In a trial of AMI patients randomized to APSAC or intravenous heparin, Meinertzetal[18] reported that the APSAC treated group had a 28 days mortality of 5.6% compared with 12.6 in the heparin treated group. However, left ventricular angiography performed 2 to 3 weeks after infarction revealed essentially identical LVEFs in the two groups.

In the Western Washington Intracoronary Streptokinase in Myocardial Infarction Trial, the 30 days mortality rates were 3.7% in the SK-treated group and 11.2% in the control group respectively, while radionuclide ventriculography revealed that the two groups had identical mean LVEFs[19].

At 6 months, out of 98 patients eligible, follow up was done for 92 patients i.e., 43 patients in 0-6 hours, 26 patients in 7-12 hours, 9 patients in 13-24 hours and 14 patients in non-thrombolyzed group. At 6 months, 2 patients had died in 7-12 hours and 2 in non-thrombolyzed. 2D echo at 6 months in followed up patients showed that 4 patients had normal left ventricular function in 0-6 hours group. Regional wall motion abnormality was in 39 patients of 0-6 hours, 23 patients of 7-12 hours, 9 patients of 13-24 hours, 12 patients of the non-thrombolyzed group. LVDD was present in 20 patients of 0-6 hours, 8 of 7-12 hours, 4 of 13-24 hours and 1 of non- thrombolyzed group. LVSD was present in 18 patients of 0-6 hours, 12 patients of 7-12 hours, 4 patients of 13-24 hours and 7 patients of non-thrombolyzed group.

Mean ejection fraction in 0-6 hours group was 49.84±8.84, in 7-12 hours was 48.00±8.30, in 13-24 hours ejection fraction was 45.78±8.64 and in non- thrombolyzed group it was 46.67±4.86.

At 1 year, 40 out of 48 patients, who were eligible were followed up i.e., 18 patients in 0-6 hours, 13 patients in 7-12 hours, 3 patients in 13-24 hours and 6 patients in non-thrombolyzed group.

There was 1 mortality in 7-12 hours group at 1 year follow up. 2D echo done on followed up at 1 year showed, 3 patients of 0-6 hours group having normal left ventricular function. 15 patients in 0-6 hours, 11 patients in 7-12 hours, 3 patients in 13-24 hours, 6 patients in non-thrombolyzed group had regional wall motion abnormality. LVDD was present in 9 of 0-6 hours, 6 of 7-12 hours, 1 patients of 13-24 hours, 1 patient of non-thrombolyzed group. LVSD was present in 5 patients

of 0-6 hours, 4 patients of 7-12 hours, 2 patients of 13-24 hours and 4 patients of non-thrombolyzed group.

Mean ejection fraction in 0-6 hours group was 52.89±7.11 in 7-12 hours, 48.00±11.37, in 13-24 hours group 42.33±8.73 and in non-thrombolyzed group it was 47.28±5.49.

CONCLUSION

In our study, immediate reduction in chest pain and rapid resolution of ST- segment occurred in more percentage of patients in late thrombolysis (7-24 hours) as compared to non-thrombolyzed group. But less when compared to early thrombolyzed group. Females had better reperfusion than males to thrombolytic therapy.

In hospital complications like cardiogenic shock, persistent hypotension, left ventricular failure, asystole and complete heart block occurred less in late thrombolyzed (7-24 hours) group as compared to non-thrombolyzed group except for ventricular tachycardia. Cardiogenic shock and ventricular tachycardia occurred less frequently in late compared to early thrombolysis than other major complications.

In hospital mortality was less in early and late thrombolyzed group as compared to non-thrombolyzed group.

Regional wall motion abnormality and left ventricular systole dysfunction occurred less frequently in early followed by late thrombolyzed group than non- thrombolyzed group but no statistically significant difference in ejection fraction noted in all the 4 groups at discharge.

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