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THE ASSESSMENT OF EFFICACY OF LATE THROMBOLYSIS IN ACUTE MYOCARDIAL INFARCTION.

General Medicine

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ABSTRACT

BACKGROUND AND OBJECTIVES: Efforts are made to give thrombolytic therapy asearly as possible after acute myocardial infarction (AMI). However, more than 30%of AMI patients present to hospital 6 hours after the onset of their first symptom, i.e.,later than the usual time window foradministration of thrombolytic therapy. Thus,extension of this time window to the patient coming up to 24 hours after the symptomonset will make such therapy available to more patients. **AIM OF THE STUDY:** The objective of the present study was to assess the efficacy of late thrombolysis (7-24hours) in AMI patients concerning symptom relief, rapid resolution of ST-elevation on treatment, mortality and left ventricular function, in-hospital and on 1month, 6 months and 1 year follow-up. To compare the late thrombolyzed group withearly thrombolyzed and non-thrombolyzed group. **METHOD:** A total of 159 consecutive patients at their first episode of AMI admittedwithin 24 hours from the onset of chest pain in the emergency department in Alluri Sitarama Raju Academy of Medical Sciences from the period August 2018 to August 2019 were included in the study. **RESULTS:** After thrombolytic therapy, rapid relief in chest pain was noted in 49patients (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-thrombolyzedgroup after routine coronary care treatment. Rapid resolution of ST-elevation wasseen in 36 patients (48.64%) of 0-6 hours, 13 patients (34.2%) of 7-12 hours, 4patients (22.22%) of 13-24 hours and 5 patients of non-thrombolyzed (17.24%).

KEYWORDS

Acute Myocardial Infarction; Thrombolytic Therapy.

INTRODUCTION:
Intravenous thrombolytic therapy has remained the mainstay ofreperfusion therapy because of its universal and rapid availability. Thrombolytictherapy of evolving myocardial infarction is based on the concept that severelyischemic myocardium can be salvaged by restoring blood supply to reversiblyinjured tissue. It has been demonstrated that the early reperfusion is achieved themore likely that the myocardial damage can be limited and mortality reduced.

The potential value of the late administration of thrombolytic therapy inpatients with acute myocardial infarction is highly controversial.

A meta-analysisof 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 In ISIS-2 trial, a 22% reduction in 5 weeks vascular mortality was evident in the 6477 patients treated 7 to 24 hours after symptom onset ($p<0.05$, two-tailed t-test).

Aim of the study :
To assess the efficacy of thrombolytic therapy with IV streptokinase after 6 to 24 hours of the onset of chest pain in acute AMI patients in terms of:

a) Immediate effect on symptom relief and ECG changes of reperfusion.
b) Effect on left ventricular function and mortality in hospital. At one month, 6 month and one-year follow-up.

To compare the above data with patients who were thrombolyzed within 6 hours from pain onset and patients who were not thrombolyzed within 24 hours from onset of pain.

METHODOLOGY:
Source of Data:
The study was carried out in Alluri Sitarama Raju Academy of Medical Sciences , Eluru. A total number of 159 consecutive patients who were admitted to CICU withthe first episode of acute myocardial infarction were studied , from August 2018 to August 2019.

Inclusion Criteria :
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 intwo or more contiguous leads that is greater than or equal to 0.1 mV (exceptionsare posterior MI defined as ST-segment depression of ≥ 0.1 mV in V1 and V2) or new-onset left bundle branch block with or without elevated cardiac enzymes.

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

History and Clinical Examination:
On admission,a detailed history is taken from the patients or attendants, particularly keeping the following points in view:
- Time from onset of chest pain, nature of pain, radiation, relation to exertionand associated symptoms like excessive sweating, vomiting, breathlessness,diarrhea, giddiness, fatigue or abdominal pain.
- History of smoking, alcohol, tobacco consumption, hypertension, diabetes mellitus, IHD, personal history, and family history of hypertension, diabetesmellitus, IHD noted.
- A thorough clinical examination was carried out in each case with special reference to pulse, blood pressure, cardiovascular examination for the presence of any cardiomegaly, S3 gallop, rub, murmur and basal crepitationinthe lung.

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

METHODOLOGY:
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 1.5million units over 45 minutes in 100 ml normal saline within 24 hours of the onset ofchest pain, categorized based on the time from onset of chest pain to the institution ofintravenous streptokinase.

The last group constituted patients who did not receivethrombolytic 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 thetime 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 forleft ventricular function and mortality.
- All the data were statistically analyzed using Chi-square and ANOVA.

Analysis of theResults:

Total 159 consecutive patients at their first episode of myocardiainfarction, admitted to ICCU within 24 hours from onset of chest pain werestudied.

Out of 159 patients, 88 patients (55.34%) presented to the hospital <6 hours of chest pain, 44 patients (27.67%) between7-12 hours and 27 patients(16.98%) within 13-24 hours from onset of chest pain. After thrombolysis, All thepatients were grouped according to the duration from the onset of chest pain tothe administration of thrombolytic agent into 0-6 hours, 7-12 hours and 13-24 hoursand non-thrombolyzed group.

Out of 130 patient who received thrombolytic therapy, 74 patient (46.5%)werethrombolyzed between 0-6 hours from onset of chest pain, i.e., earlythrombolyzed, 38 patients (23.9%) between 7-12 hours, 18 patients (11.3%)between 13-24 hours from pain onset. Thus 56 patients (35.2%) were latethrombolyzed i.e., 7-24 hours.

29 patients belonged to the non-thrombolyzed group out of total 159patients (9 admitted within 0-6 hours, 9 patients between 7-12 hours and 11patients within 13-24 hours from onset of chest pain).

Out of total of 159 patients, 25 (15.72%) patients died in the hospital.

Therewere 18 deaths (13.84%) in thrombolyzed group and 7 (24.13%) deaths in non-thrombolyzed groups.

There were 11 deaths (14.86%) in 0-6 hours group. 2 (5.26%) in 7-12hours, 5 (27.77%) in 13-24 hours and 7 (24.13%) in non-thrombolyzed group.

When mortality in 7-24 hours group is combined (late group), there were 7 deaths(12.5%).

At 1 month follow-up:

Out of 134 patients who survived initial hospitalization, follow-up was done for 110 patients, i.e., 51 patients (12 lost) in 0-6 hours group, 30 patients (6lost) in 7-12 hours group, 12 patients (1 lost) in 13-24 hours group and 17 patients(5 lost) in non-thrombolyzed group and the following are the observed

Table-1: Relationship between Duration from Chest Pain to Thrombolytic Therapy and 2D Echo at 1 month

	Group							
	0 – 6 hrs (n=50)		7 – 12 hrs (n=30)		13 – 24 hrs (n=11)		Non-thrombolyzed (n=16)	
	No.	%	No.	%	No.	%	No.	%
Normal	6	12.00	--	--	--	--	--	--
RWMA	43	86.00	30	100.0	11	100.0	16	100.0
LVDD	23	46.10	9	30.0	3	27.27	6	37.50
LVSD	19	38.00	14	46.66	6	54.54	11	68.75
EF	50.4±9.07		47.47±8.34		47.91±6.31		45.13±7.72	

df=1.811 p=0.148

In 0-6 hours group, 6 patients (12%) had a normal left ventricular function, 43 patients (86%) had regional wall motion abnormality, 23 patients (46%) hadLVDD, 19 patients (38%) had LVSD with mean ejection fraction 50.40±9.07.

In 7-12 hours group, 30 patients (100%) had regional wall motion abnormality, 9 patients (30%) had LVDD, 14 patients (46.66%) LVSD with a meanejection fraction of 47.47±8.34.

In the 13-24 hours group, 11 patients (100%) had regional wall motion abnormality, 3 patients (27.27%) had LVDD, 6 patients (54.54%) LVSD witha mean ejection fraction of 47.91±6.31.

In the non-thrombolyzed group, 16 patients (100%) had regional wallmotion abnormality, 6 patients (37.5%) had LVDD, 11 patients (68.75%) LVSDwith a mean ejection fraction of 45.13±7.12.

At 6 months follow-up:

Out of 107 patients who came for 1-month follow-up, 98 patients were eligible for 6 months follow-up within the study period. Follow-up was done for 92 patients i.e., 43 patients (2 lost) in 0-6 hours, 26 (2 lost) in 7-12 hours, 9 (1lost) in 13-24 hours, 14 patients (1 lost) in non-thrombolyzed group. Followingare the results of the observations.

Table 2:	Group							
	0 – 6 hrs (n=43)		7 – 12 hrs (n=24)		13 – 24 hrs (n=9)		Non-thrombolyzed(n=12)	
	No.	%	No.	%	No.	%	No.	%
Normal	4	9.30	--	--	--	--	--	--
RWMA	39	90.69	23	95.83	9	100.0	12	100.0
LVDD	20	46.51	8	33.33	4	44.44	1	8.33
LVSD	18	41.86	12	5.00	4	44.44	7	18.33
EF	49.84±8.84		48.00±8.30		45.78±8.64		46.67±4.86	

df=1.811 p=0.148

At 1 year follow-up:

Out of 87 patients who came for 6 months follow-up, 48 cases were eligible for 1 year follow-up. Follow up was done for 40 cases i.e., 18 patients (4lost) in 0-6 hours, 13 patients (1 lost) in 7-12 hours, 3 patients (2 lost) in 13-24hours, 6 patients (1 lost) in non-thrombolyzed group. Following are theobservations noted.

Table-3: Relationship between Duration from Chest Pain to Thrombolytic Therapy and 2D Echo at 1 Year.

	Group							
	0 – 6 hrs (n=18)		7 – 12 hrs (n=12)		13 – 24 hrs (n=3)		Non-thrombolyzed (n=6)	
	No.	%	No.	%	No.	%	No.	%
Normal	3	16.66	--	--	--	--	--	--
RWMA	15	83.33	11	91.66	3	100.0	6	100.0
LVDD	9	50.0	6	50.0	1	33.33	1	16.66
LVSD	5	27.7	4	33.33	2	66.66	4	66.66
EF	52.89±7.11		48.00±11.37		42.33±8.73		47.29±5.49	

DISCUSSION & 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.

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 the early and late thrombolyzed group as compared to the 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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