

A study of time interval between thrombolytic treatment and Outcome in Patients with myocardial infraction

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Abstract

Introduction: The time-related effect of treatment on survival and myocardial salvage in patients with acute myocardial infarction (MI) has been demonstrated in thrombolysis trials **Aims and Objectives:** To study Time interval between thrombolytic treatment and Outcome in Patients with Myocardial infraction. **Methodology:** This was a hospital based cross-sectional study of the Patients who were admitted to tertiary health care Centre with diagnosis of Myocardial Ischemia diagnosed by ST-Elevation Myocardial Infarction during the Period of One year from June 2014 to June 2015 at tertiary health care Centre. Total 120 patients were enrolled into the study The statistical analysis done by Chi-square test calculated by Graph Pad Prism software. **Results:** The majority of the Patients were from 40-50 -26.67% followed by 50-60- 25.00%, >60- 19.16% 30-40- 19.16%, 20-30- 10%. Majority of the Patients were Male i.e. 58.33% and 41.67% were Female Majority of the Patients who recovered completely from the illness were the patients who received treatment <2 Hr. from onset of the Symptoms i.e. 66.67% as compared to 31.95% who received treatment >2Hr. This observed difference is statistically significant. ($X^2 = 13.99$, $df=1$, $P<0.0002$.) **Conclusion:** In our study the Recovery among the MI patients were significantly higher if the treatment is started within 2 hrs. duration.

Key Words: Thrombolytic treatment, Myocardial infraction(MI), Outcome of the MI Patients.

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INTRODUCTION

The time-related effect of treatment on survival and myocardial salvage in patients with acute myocardial infarction (MI) has been demonstrated in thrombolysis trials.¹⁻⁶ Besides timing of treatment, the grade of flow achieved with reperfusion is important for the long-term outcome.⁷⁻¹⁰ Primary angioplasty for patients with acute MI has been shown in randomized trials¹¹⁻¹⁴ to be a very effective reperfusion therapy, and high rates of complete

and sustained patency have been reported. The benefits of thrombolytic treatment are greatest when it is given early in acute myocardial infarction.¹⁵ In animal models, infarct size and left ventricular function, the major prognostic determinants in clinical myocardial infarction, were adversely averted in a rapid and non-linear fashion by the duration of coronary occlusion.^{16,17} Attempts to demonstrate such an association in clinical studies have yielded conflicting results. One meta-analysis¹⁸ and two trials^{18, 19} of thrombolysis in acute myocardial infarction suggest a direct linear effect of time to thrombolysis on mortality, infarct size, and ejection fraction, with a gradual diminution of benefit with increasing delay. In contrast, other clinical trials²⁰⁻²² indicate a non-linear delay/benefit relation, with a pronounced decline in benefit after occlusion of one to three hours. Beyond this time threshold, other factors—such as the degree of myocardium at risk, collateral blood flow, and metabolic demand—exert a greater impact on outcome.^{23, 24}

METHODOLOGY

This was a hospital based cross-sectional study of the Patients who were admitted to tertiary health care Centre with diagnosis of Myocardial Ischemia diagnosed by ST-Elevation Myocardial Infarction during the Period of One year from June 2014 to June 2015 at tertiary health care Centre. Total 120 patients were enrolled into the study. Detailed clinical history and treatment and Outcome in the patient is recorded and the Time interval between the Onset of symptoms and starting of thrombolytic treatment was also noted. Here the term Completely recovered taken as not having any chronic disease as congestive cardiac failure and narrowing of coronary vessels etc. The statistical analysis done by Chi-square test calculated by Graph Pad Prism software.

RESULT

Table 1: Age wise Distribution of the MI Patients

| Age | No. | Percentage (%) |
|--------------|------------|-----------------|
| 20-30 | 12 | 10% |
| 30-40 | 23 | 19.16% |
| 40-50 | 32 | 26.67% |
| 50-60 | 30 | 25.00% |
| >60 | 23 | 19.16% |
| Total | 120 | 100.00 % |

The majority of the Patients were from 40-50 -26.67% followed by 50-60- 25.00%, >60- 19.16%, 30-40- 19.16%, 20-30- 10%.

Table 2: Gender wise Distribution of the MI Patients

| Sex | No. | Percentage (%) |
|--------------|------------|----------------|
| Male | 70 | 58.33% |
| Female | 50 | 41.67% |
| Total | 120 | 100% |

Majority of the Patients were Male i.e. 58.33% and 41.67% were Female

Table 3: Distribution of the MI Patients as per Time interval between thrombolytic treatment and Outcome

| Time interval (Hr.) | Recovered | Not Recovered | Total |
|---------------------|--------------------|-------------------|-------------------|
| <2 Hr. | 32 (66.67%) | 16 (33.33%) | 48 (100%) |
| >2Hr. | 23 (31.95%) | 49(68.05%) | 72 (100%) |
| Total | 55 (45.83%) | 65(54.16%) | 120 (100%) |

$\chi^2 = 13.99$, $df=1$, $P<0.0002$

From Table 3: It is clear that majority of the Patients who recovered completely from the illness were the patients who received treatment <2 Hr. from onset of the Symptoms i.e. 66.67% as compared to 31.95% who received treatment >2Hr. This observed difference is statistically significant. ($\chi^2 = 13.99$, $df=1$, $P<0.0002$.)

DISCUSSION

Although the time delay had no effect on the patency rate after the angioplasty procedure, there was more extensive myocardial damage. As patency is the major determinant of survival, these results in a comparable 6-month clinical outcome of transferred patients compared to non transferred patients. The effects of treatment delay could be measured in enzymatic infarct size as well as LVEF. However, more factors may play a role in the degree of myocardial salvage. The presence or absence of collaterals, the size of the infarct area, history of previous infarction or previous angina will be responsible for a wide range of outcomes in individual patients. Nevertheless, for these patient groups a difference in measured infarct size and LVEF was found in relation with a median treatment delay of 43 min. In Our study we have observed that the majority of the Patients were from 40-50 -26.67% followed by 50-60- 25.00%, >60- 19.16% 30-40- 19.16%, 20-30- 10%. Majority of the Patients were Male i.e. 58.33% and 41.67% were Female. Majority of the Patients who recovered completely from the illness were the patients who received treatment <2 Hr. from onset of the Symptoms i.e. 66.67% as compared to 31.95% who received treatment >2Hr. This observed difference is statistically significant. ($X^2 = 13.99$, $df=1$, $P<0.0002$.) The recovery was assessed by ECG, Tread-meal test, 2 D-Echo and Angiography to see any chronic disease like CCF, Chronic ischemia etc. non –recovery included the complicated patients and died patients and Transferred to Higher or Surgical Intervention etc. In our study total 7 patients died all of them were brought to hospital more than 2 Hr. Duration. The reason why the patients should be brought to hospital within 2 hr. is that the thrombolytic therapy only effective if used within 2 hrs. Of clotting to prevent damage to Myocardial wall.

CONCLUSION

In our study the Recovery among the MI patients were significantly higher if the treatment is started within 2 hrs. duration.

REFERENCES

1. Fibrinolytic Therapy Trialists' (FFT) Collaborative Group. Indications for fibrinolytic therapy in suspected acute myocardial infarction: collaborative overview of early mortality and major morbidity results from all randomized trials of more than 1000 patients. *Lancet* 1994;343:311–22.
2. Gruppo Italiano per lo studio dellastreptochinasinell' infarctomiocardico (GISSI). Effectiveness of intravenous thrombolytic treatment in acute myocardial infarction. *Lancet* 1986;1:397–402.
3. Hermens WT, Willems GM, Nijssen KM, Simoons ML. Effect of thrombolytic treatment delay on myocardial infarction size (letter). *Lancet* 1992;340: 1297.

4. Lee KL, Woodlief LH, Topol EJ, *et al.*, for the GUSTO-I Investigators. Predictors of 30-day mortality in the era of reperfusion for acute myocardial infarction. Results from a international trial of 41 021 patients. *Circulation* 1995;91:1659–68.
5. Newby LK, Rutsch WR, Califf RM, *et al.*, for the GUSTO-I Investigators. Time from symptom onset to treatment and outcomes after thrombolytic therapy. *J Am CollCardiol* 1996;27:1646–55.
6. Califf RM, Newby LK. How much do we gain by reducing time to reperfusion therapy? *Am J Cardiol* 1996;78 (suppl 12A):8–15.
7. The GUSTO Angiographic Investigators. The effects of tissue plasminogen activator, streptokinase, or both on coronary-artery patency, ventricular function, and survival after acute myocardial infarction. *N Engl J Med* 1993;329:1615–22. [Erratum *N Engl J Med* 1994;330:516].
8. Brodie BR, Stuckey TG, Kissling G, *et al.* Importance of infarct-related artery patency for recovery of left ventricular function and late survival after primary angioplasty for acute myocardial infarction. *J Am CollCardiol* 1996;28:319–25.
9. Lamas GA, Flaker GC, Mitchell G, *et al.* Effect of infarct artery patency on prognosis after acute myocardial infarction. *Circulation* 1995;92:1101–9.
10. Simes RJ, Topol E, Holmes DR, *et al.*, for the GUSTO-I Investigators. Link between the angiographic substudy and mortality outcomes in a large randomized trial of myocardial reperfusion. Importance of early and complete infarct artery reperfusion. *Circulation* 1995;91:1923–8.
11. Zijlstra F, de Boer MJ, Hoorntje JCA, *et al.* A comparison of immediate coronary angioplasty with intravenous streptokinase in acute myocardial infarction. *N Engl J Med* 1993;328:680–4.
12. Grines CL, Browne KF, Marco J, *et al.* A comparison of immediate angioplasty with thrombolytic therapy for acute myocardial infarction. *N Engl J Med* 1993;328:673–9.
13. De Boer MJ, Suryapranata H, Hoorntje JCA, *et al.* Limitation of infarct size and preservation of left ventricular function after primary coronary angioplasty compared with intravenous streptokinase in acute myocardial infarction. *Circulation* 1994;90:753–61.
14. Zijlstra F, Beukema WP, van 't Hof AWJ, *et al.* A randomized comparison of primary coronary angioplasty with thrombolytic therapy in low risk patients with an acute myocardial infarction. *J Am Coll Card* 1997;29:908–12
15. Fibrinolytic Therapy Trialists' (FTT) Collaborative Group. Indications for fibrinolytic therapy in suspected acute myocardial infarction: collaborative overview of early mortality and major morbidity results from all randomised trials of more than 1000 patients. *Lancet* 1994;343:311–22.
16. Reimer KA, Jennings RB. The "wavefront phenomenon" of myocardial ischemic cell death, II: transmural progression of necrosis within the framework of ischemic bed size (myocardium at risk) and collateral flow. *Lab Invest* 1979;40:633–44.
17. Reimer KA, Heide RSV, Richard VJ. Reperfusion in acute myocardial infarction: effect of timing and modulating factors in experimental animal models. *Am J Cardiol* 1993;72: 13–21G.
18. Kennedy JW, Martin GV, Davis KB, *et al.* The Western Washington Intravenous Streptokinase in Acute Myocardial Infarction Randomised Trial. *Circulation* 1988;77:345–52.
19. Raitt MH, Maynard C, Wagner G, *et al.* Relation between symptom duration before thrombolytic therapy and final myocardial infarct size. *Circulation* 1996;93:48–53.
20. Gruppo Italiano per lo Studio della Sopravvivenza nell'Infarto Miocardico. GISSI-2: a factorial randomised trial of alteplase vs streptokinase and heparin vs no heparin among 12,490 patients with acute myocardial infarction. *Lancet* 1990;336:65–71.
21. Newby LK, Rutsch WR, Califf RM, *et al.* for the GUSTO-I Investigators. Time from symptom onset to treatment and outcomes after thrombolytic therapy. *J Am CollCardiol* 1996;27:1646–55.
22. Boersma E, Maas AC, Deckers JW, *et al.* Early thrombolytic treatment in acute myocardial infarction: reappraisal of the golden hour. *Lancet* 1996;348:771–5.
23. Milavetz JJ, Giebel DW, Christian TF, *et al.* Time to therapy and salvage in myocardial infarction. *J Am CollCardiol* 1998;31:1246–51.
24. Christian TF, Schwartz RS, Gibbons RJ. Determinants of infarct size in reperfusion therapy for acute myocardial infarction. *Circulation* 1992;86:81–90.

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