ABSTRACT
The introduction of thrombolytic therapy has revolutionized the management of acute myocardial infarction. The time from symptom onset to thrombolytic therapy is the major determinant of myocardial salvage. Currently the evidence supporting the use of prehospital thrombolysis is quite strong as documented in randomized clinical trials. If the time between medical contact to needle (thrombolytic administration) is < 30 min, prehospital thrombolysis is the preferred treatment of choice. If this delay is > 2 hrs, alternative strategies should be considered. For delays between 30 min to < 2 hrs, practical logistics should be considered to choose between prehospital thrombolysis and primary angioplasty. While applying global scientific evidence for prehospital thrombolysis the Indian perspective should not be ignored.

Keyword: Myocardial Infarction, prehospital thrombolysis.

INTRODUCTION
Acute myocardial infarction (AMI) remains one of the main causes of death in patients with coronary artery disease. The advent of thrombolytic therapy revolutionized the management of AMI. Large randomized trials such as GISSI and ISSIS2 have clearly demonstrated the reduced mortality benefit in the 80s. However; its effectiveness has been shown to be time dependent i.e. earlier the start of therapy better the outcome. The current studies have focused on strategies to reduce the time from symptom onset to thrombolytic infusion. These include early identification of AMI symptoms, bolus thrombolytic agents and prehospital thrombolysis. The latter has strong supportive evidence to recommend its use.

RATIONALE FOR PREHOSPITAL THROMBOLYSIS
Experimental data and animal models have provided direct evidence of the critical correlation between time of arterial occlusion and irreversible myocardial injury. Multiple human clinical studies have documented a relation between time of initiation of reperfusion therapy and survival among patients with ST elevation AMI. A meta analysis published by Boersma et al. showed that treatment given 30 min earlier in the first 90 min after chest pain onset results in an additional 10 to 30 lives saved per thousand treated.

Together, such experimental and clinical data provide a consistent body of evidence supporting a rationale for thrombolysis at the earliest for eligible patients. Considering the above; prehospital electrocardiography, early AMI patient identification and prehospital thrombolysis have a definite role to play in patients with ST segment elevation AMI.

PRE REQUITIES FOR PREHOSPITAL THROMBOLYSIS
It is important to know the structure of the prehospital thrombolysis programme. The programme includes:

a. Well equipped cardiac ambulances.
b. Ability to perform 12 lead ECG in ambulances.
c. Trained medics and paramedics to interpret ECGs.
d. ECG transmission facility to a specialized center.
e. Capability to treat cardiac and cerebrovascular emergencies in ambulances.
f. Availability of bolus dose – thrombolytic agents.
g. Facility to provide awareness and education programme directed at the general population on disease manifestation and strategies to reduce ambulance service time.

EFFICACY OF PREHOSPITAL THROMBOLYSIS
Several small studies have documented the efficacy of prehospital thrombolysis. Patients receiving prehospital thrombolysis achieved earlier ST segment resolution indicating a decrease in time to reperfusion.

Comparison of prehospital thrombolysis versus in-hospital thrombolysis is best documented in the meta-analysis published by Morrison et al. This systematic review analysed 6 major randomized trials (MITI, EMIP, GREAT, Roth et al, Schofer et al, Castagne et al) comparing prehospital and in-hospital thrombolysis in 6,434 patients. The individual studies showed a tendency toward decreased mortality among patients receiving prehospital thrombolysis, although not statistically significant. However; when assessed jointly the studies showed statistically significant reduction (17%) in the all cause mortality (p=0.03).
Prehospital Thrombolysis

2% reduction in the absolute risk can be translated into one life saved for every 62 patients submitted to this therapy. Statistically significant differences were seen with 1 yr and 2 yr mortality favoring prehospital thrombolysis. Comparison of prehospital thrombolysis with primary PCI in the CAPTIM trial revealed no statistically significant difference in the composite primary endpoints (death, non fatal reinfarction and non fatal disabling stroke within 30 days) or mortality, suggesting that PCI did not confer an event free survival benefit.1 A re-analysis of the CAPTIM study showed that among patients randomized < 2 hrs after symptom onset, there was a strong trend toward lower 30 day mortality with prehospital fibrinolysis (2.2% vs 5.7%, p = 0.59).2 From the CAPTIM trial it was concluded that the time from the symptom onset should be one of the main factors to be considered while choosing reperfusion strategy after AMI. However; a recent study showed that the incidence of aborted AMI did not assume statistical significance when comparing perhospital and in-hospital thrombolysis.3

RECOMMENDATION

Reperfusion strategy after AMI will depend upon several factors including time of onset of chest pain, availability of emergency medical services capable of prehospital thrombolysis and transport facility available to PCI - capable hospital. If the time from medical contact to needle is < 30 min prehospital thrombolysis should be preferred with bolus thrombolytics. If symptoms onset to needle time is < 2 hrs and PCI facility is not available within 90 min then prehospital thrombolysis is advisable. Any further delay > 2 hrs prehospital thrombolysis is not the first desired option.

INDIAN PERSPECTIVE

In todays practice, evidence based medicine is mandatory. However, we must review each modality of therapy from an Indian perspective. Reperfusion therapy of AMI should necessarily have a geographical referral system. This means that the patient will be treated by the nearest quality controlled CCU or prehospital ambulance service. A particular emergency medical care service whether CCU or ambulance service should be marked for a given population in the vicinity of the service. A routinely available ambulance service with the paramedic staff is not geared to provide prehospital thrombolysis today. City based major institutions should provide emergency satellite units to achieve the time benefit required in treating AMI. Implementation of prehospital thrombolysis in India will require support, interest and participation of hospital administrators, dedicated community leaders, physicians, cardiologists and appropriate structuring and resourcing of emergency medical services. Applying evidence based medicine without quality control protocols can be more dangerous than not abiding by the therapy guidelines. This rule applies also to in-hospital thrombolysis and primary PCI.

CONCLUSIONS

A prehospital strategy of ECG diagnosis of AMI, confirmation of thrombolytic eligibility and administration of fibrin specific bolus dose lytics is a feasible approach to provide early reperfusion to patients with ST segment elevation AMI. Medical contact to needle time of < 30 min is ideal, however a time frame of < 2 hrs from symptom onset is also beneficial. In our country where the primary PCI rates range for 3% - 20%, the role of prehospital thrombolysis becomes crucial. Finally, before applying the current guidelines for prehospital thrombolysis the practical perspective involved in providing such services to a given population should be assessed and evolved by individual cardiac units.

REFERENCES

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