The thrombolytic therapy in the periphery – towards reduction of ‘call to needle time’

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Abstract

Objectives  To identify and rectify deficiencies in the current practice, with regard to thrombolytic therapy in the management of acute myocardial infarction in the coronary care unit at Base Hospital Panadura.

Design and Setting  90 patients (Male = 71) with an ECG confirmed acute myocardial infarction admitted to the said unit between 08/01/1997 to 21/03/1999 were given a questionnaire with respect to the above matters and thus obtained data were analysed.

Results  Age range of patients was between 25-85 years with a mean of 55.4 ± 12.9 (SD) years. 38 had presented to the hospital within first hour, 27 within next three hours after the onset of chest pain. 71 had presented to local hospitals and 19 to the GPs. 18 had transfer delays from the local hospitals while in 19 this was due to negligence. 11 presented to the GPs had ECG confirmation while none in the hospital transfers. Aspirin 300mg was offered to 70; not given in 16; unknown in 04. 37 had reached the CCU from OPD within 5 minutes; 85 within 15 minutes. The house officers had seen 85 within 5 minutes of admission to the CCU or wards. Immediate ECGs had been done in 50 who presented during hospital hours. 40, presented outside working hours; had delayed ECGs due to lack of an ECG machine in the CCU and unavailability of onsite on-call ECG technicians. In 67, junior medical officers have taken the initial decision to thrombolise, out of which 13 had been wrong; ST elevations had been wrong; ST elevations had been the sole indication.

Interventional measures  ECG machines were made available in the CCU to perform ECGs outside working hours with training of medical officers.

Conclusions

• "Call to needle time" needs improvement at various levels.
• Logistics such as ECG machines, access to "fast track" transport facilities should be made available to the local hospitals.
• Regional protocols for management of acute infarctions should be formulated and adapted with adequate training of all grades involved.

Introduction

Recent advances in the management of acute myocardial infarction, i.e. thrombolysis, combined with aspirin, beta blockers and ACEI therapy in appropriate cases have revolutionised the outcome of this dreadful acute medical emergency over the last decade. Prompt diagnosis and swift action are two most important aspects of achieving the maximum success in the above. In Sri Lanka the base hospitals serve as the first line referral centres where acute infarctions are managed, with or without ICU facilities. The base hospital Panadura equipped with a seven bedded ICU and a 16 bedded intermediate coronary care unit is one of the largest and busiest units in the country serving large population in both Colombo and Kalutara districts. The following audit was designed to look into various aspects of management of acute myocardial infarctions admitted to the said unit.

Results

Age distribution of the patients included in the study:

<table>
<thead>
<tr>
<th>Age range (years)</th>
<th>No. of patients</th>
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<tbody>
<tr>
<td>20-30</td>
<td>03</td>
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<td>21-40</td>
<td>05</td>
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<td>41-50</td>
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<td>51-60</td>
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<td>71-80</td>
<td>06</td>
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<td>81-90</td>
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Soluble aspirin in a dose of 300mg should be offered at the earliest as the first line therapy to the patients where a diagnosis of a acute myocardial infarction is suspected. Aspirin irreversibly blocks the enzyme cyclo-oxygenase and therefore inhibits prostaglandin biosynthesis. In several animal models aspirin does not accelerate thrombolysis by plasminogen activators, but seems to delay or prevent the occlusion after successful lysis\(^3\). The clinical benefits of oral aspirin in acute infarctions have been impressively documented in the ISIS-2 trial\(^3\) with 23% reduction mortality by giving aspirin alone, whereas in the group assigned to receive intravenous streptokinase, prevention of re-infarction, rather than acceleration of lysis also appears to be the mechanism of its benefit in humans. After bypass surgery, sheen induced platelet thrombus formation was suppressed by high doses of aspirin (>300 mg daily) but not by low doses (75 mg daily) suggesting a mechanism other than interference with thromboxane formation\(^4\). In our series aspirin was not offered to 16 and in 4 the delay was unknown. Following aspirin administration next comes the issue of thrombolysis which has been unequivocally shown to improve the survival after an acute myocardial infarction compared with conventional treatment or placebo as demonstrated by the major placebo control trials\(^5\). The most striking drug dependent reduction (47% and 56% respectively) was in fact observed in patients treated within 1 hour after the onset of symp-
elevation patients presenting a larger thrombus rich in fibrin may offer a more favourable milieu for lysis. The same does not seem to apply patients without ST segment elevation, who probably have a significantly smaller amount of thrombus much more rich in platelets. In our series ST elevations have been the sole criterion to institute thrombolysis. "High take-off ST segments" (congenital ST elevations), ST elevations in Prinzmetal's angina, persistent ST elevations in septal leads in old antero-septal infarctions have been the major confusions for the wrong decisions in thrombolysis in our series. This once again emphasises the importance of availability of on-site facilities to perform at least CPK-MB, to resolve such confusions. In the case of a left bundle branch block (LBBB) the initial decision to thrombolise will be difficult due to the unavailability of sophisticated investigations such as CPK-MB or cardiac troponin.

Conclusions

In our experience, once as patient is suspected of having an acute myocardial infarction, the maximum benefits of the medical therapies available could be conferred by:

- reducing the "Call to needle time" by developing an integrated team approach to treat such patients, involving the referring hospitals or general practitioners in the area.
- providing logistics such as ECG machines, access to "fast track" transport facilities in the peripheral referring hospitals.
- formulating regional protocols for management of acute infarctions with adequate training of all grades involved.
- educating the population at high risk.

References


10. Late study group. Late assessment of thrombolytic efficacy (LATE) study ataplace, 6-24 hours after onset if acute myocardial infarction. Lancet 1993; 342: 759-766.


