EARLY MANAGEMENT OF MYOCARDIAL INFRACTION: A REPORT FROM THE WAIKATO HOSPITAL, NEW ZEALAND

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ABSTRACT

A retrospective review was made of the early management of 50 consecutive patients admitted with an acute myocardial infarction to assess the potential suitability and actual application of thrombolysis, intravenous beta-blockade and aspirin therapy. Thrombolysis was indicated for 15 patients (30%), of whom 14 actually did receive intravenous streptokinase. Thus, 93.3% of all eligible patients received thrombolysis. The main contraindication to thrombolysis was a presentation more than six hours from onset of symptoms in 26 patients (52%). Intravenous beta-blockade was indicated for 17 patients (34%), six patients were actually treated resulting in a therapeutic coverage of 35.3%. Heart failure in 21 patients (42%) was the main contraindication. Aspirin was indicated for 48 patients (96%). However, only 14 were treated giving a therapeutic coverage of 29.2%. A large majority of our patients with an acute myocardial infarction were eligible to receive aspirin which has been a neglected therapeutic modality.

Keywords: Early management, myocardial infarction, thrombolysis, beta-blockade, oral aspirin.

INTRODUCTION

Until the early 1980's the early management of acute myocardial infarction was pain relief and treatment of complications as they arose[1]. Since then, intravenous beta-blockade[2-4], thrombolysis[5,6], and oral aspirin[7] have been shown to improve prognosis when initiated in the early stages of acute myocardial infarction. We reviewed the early management of patients with an acute myocardial infarction in the Coronary Care Unit of the Waikato Hospital to assess the potential suitability and actual application of these therapeutic modalities.

METHOD

Medical and nursing records of 50 consecutive patients admitted to the Coronary Care Unit of the Waikato Hospital with a diagnosis of an acute myocardial infarction between June and September 1988 were reviewed retrospectively.

Thrombolysis was with 1.5 MU of streptokinase infused over 30 minutes. Contraindications to thrombolysis were a presentation over six hours from onset of symptoms, confirmed peptic ulcerative disease in the previous year, a recent cardiac resuscitation, age over 70 years and the absence of significant ST segment elevation on the electrocardiogram. Thrombolysis was deemed to be indicated for all patients with no contraindication to it.

Intravenous beta-blockade was initiated with a total of 15 mg metoprolol given in three doses at five minute intervals. Contraindications to beta-blockade were clinical or radiological heart failure; hypotension with a systolic blood pressure

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below 105 mm Hg; bradyarrhythmia with a rate below 50 per min, a PR interval above 0.24 s or higher grades of atrioventricular block; and a history of obstructive airway disease. Patients with no contraindication were deemed to be indicated for beta-blockade, regardless of whether they actually received the therapy.

Aspirin was initiated at 150 mg orally. Therapy was contraindicated in patients with a confirmed history of peptic ulcerative disease. All patients with no contraindication to therapy were deemed to be indicated for oral aspirin.

Statistical analysis was carried out using the Student's t-test.

RESULTS

A total of 50 patients were reviewed, of whom 33 were males and 17 were females. Patients presenting within six hours of onset of symptoms were significantly younger than patients presenting more than six hours after onset of symptoms (x_1 = 62.3 ± 7.8 yr, x_2 = 68.6 ± 7.7 yr; p < 0.01).

Thrombolysis was initiated for 14 patients (28%). The contraindications to therapy are shown in Table I, with a late presentation being the main contraindication to thrombolysis (52%). There was no contraindication to therapy in one patient who did not receive thrombolysis. Thus, thrombolysis was indicated for 15 patients (30%), of whom 14 patients (28%) actually received therapy resulting in a therapeutic coverage of 93.3% (refer to Table II)

Table I
Reasons For Withholding Thrombolysis

Reason	Patients	
	No.	(%)*
Over 6 hr from onset	26	(52)
Recent resuscitation	1	(2)
Recent peptic ulcer	1	(2)
Failure to meet entry criteria	7	(14)
No contraindication	1	(2)

* Expressed as percentage of all 50 patients reviewed.

Intravenous beta-blockade was initiated in six patients (12%). The contraindications to therapy are shown in Table III with heart failure forming the most frequent contraindication (42%). Five patients (10%) had more than one contraindication to therapy. There was no contraindication in 11 patients who

did not receive beta-blockade. Thus, beta-blockade was indicated for 17 patients (34%), of whom six patients (12%) actually received therapy resulting in a therapeutic coverage of 35.3% (refer to table II).

Table II
Therapeutic profile

	Thrombolysis No. (%)**	Beta-Blockade No. (%)**	Aspirin No. (%)**
Therapy indicated	15 (30)	17 (34)	48 (96)
Therapy initiated	14 (28)	6 (12)	14 (28)
*Therapeutic coverage (%)	93.3	35.3	29.2

* Therapeutic Coverage = Therapy Initiated / Therapy Indicated
** Expressed as percentage of all 50 patients reviewed

Table III
Reasons For Withholding Beta-blockade

Reason*	Patients No.	(%)**
Heart failure	21	(42)
Hypotension	6	(12)
Bradyarrhythmia	8	(16)
Obstructive airway disease	3	(6)
No contraindication	11	(22)

* 5 patients had more than one contraindication to beta-blockade
** Expressed as percentage of all 50 patients reviewed

Oral aspirin was initiated in 14 patients (28%). The only contraindication to therapy was a history of confirmed peptic ulcerative disease in two patients (4%). There was no contraindication to therapy in 34 patients who did not receive oral aspirin. Thus, aspirin was indicated for 48 patients (96%), of whom only 14 (28%) received therapy resulting in a therapeutic coverage of 29.2% (refer to Table II)

DISCUSSION
The value of thrombolysis in the early management of acute myocardial infarction is now established. Mortality is reduced, infarct size is reduced, and left ventricular function is improved[8]. The earlier the therapy is initiated, the better the outcome for the patient[5]. A majority of our patients did not meet the criteria for thrombolysis, a finding similarly noted at other centres[8-10]. A delayed presentation of over six hours from onset of symptoms was the main reason excluding thrombolysis. Patients presenting over six hours from onset were significantly older than those presenting under six hours. This is compatible with evidence suggesting an atypical presentation of myocardial infarction in elderly patients[11]. In 1988, we had excluded patients above 70 years and those without ST segment elevation from thrombolysis[12]. However, recent evidence suggests that elderly patients would especially benefit from thrombolysis[7], and the two largest trials to demonstrate the dramatic value of thrombolysis included patients without ST segment elevation in the presenting electrocardiogram[5,7]. Our protocol for thrombolysis is presently being reviewed to include elderly patients and those without ST segment elevation in the presenting electrocardiogram. Over 90% of patients eligible for thrombolysis actually received therapy reflecting the high awareness of the benefits of thrombolysis in our hospital.

Given in the early hours of an acute myocardial infarction, beta-blockers have been shown to reduce infarct size, to reduce reinfarction, to reduce cardiac arrests and to reduce over-

all mortality[2]. Intravenous beta-blockade is safe provided patients having definite contraindications are excluded from therapy[13]. A majority of our patients did have a definite contraindication to beta-blockade, leaving only 34% eligible for therapy. The value of beta-blockade is less impressive than that of thrombolysis, and its decreasing role in the early management of myocardial infarction is a reason for our poor therapeutic coverage of 35.3%[14]. Nevertheless, it is reasonable to combine thrombolysis with beta-blockade in patients eligible for both these modalities of therapy[15].

A high incidence of reocclusion has been noted after thrombolytic therapy[5]. There is evidence of platelet activation after thrombolysis and the need for an agent to maintain myocardial reperfusion has been recognised[16,17]. Aspirin improves myocardial blood flow in experimental infarction and has been shown to prevent coronary reocclusion after thrombolysis[18,19]. With the impressive results from ISIS 2 demonstrating the value of aspirin in reducing acute mortality, aspirin should have an established role in the early therapy of myocardial infarction[13,20,21]. It is cheap, easy to administer and has few contraindications; and the patient or his general practitioner can thus initiate therapy immediately once symptoms are recognised. Its epidemiological impact on mortality reduction of acute infarction in any society would thus be tremendous given these advantages.

Our study thus demonstrates that while thrombolytic therapy is being appropriately given, aspirin therapy and, to a lesser extent, intravenous beta-blockade which are both beneficial in acute myocardial infarction are not being given to a significant number of patients. This may be due to the time lag in translating clinical trials into practical therapeutics in a field of rapid advancement. The problem is worsened because admitting medical staff in our hospital were often those on rotation with no special cardiological interest. We do not know if this is true of other hospitals, but we suspect the situation would not be dissimilar.

In the recent GISSI-2 trial, mortality from myocardial infarction was noted to be much lower than during the GISSI-1 trial[22]. However, the therapy given to patients with myocardial infarction will depend on the attending medical staff, whether at the emergency room or in general practice. Our study suggests that in the coronary care unit, the value of thrombolysis is well known and initiated on almost all those who qualify for it. On the other hand, the poor therapeutic coverage of oral aspirin identifies an area in need of special emphasis in the continuing education of medical practitioners of all disciplines.

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