

Original Research Article

Assessment of management approach for myocardial infarction by family physicians in central India: a cross sectional survey

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ABSTRACT

Background: Myocardial infarction (MI) is the most common cause of mortality globally. Patients generally consult their family physicians first and hence the role of these physicians in management of is very important. It is thus pertinent to assess the approach to management of MI patients by the primary health care physicians.

Methods: A cross-sectional survey was conducted with a validated questionnaire among 232 family physicians in central India.

Results: Combination of aspirin, clopidogrel and statins was the treatment of choice by 69.82% of physicians. Use of morphine was not preferred by 87.93% of physicians due to non-availability. Tramadol, diclofenac and pethidine were the analgesics preferred. Use of aspirin was stressed by 91.37% of physicians, of these 56.89% preferred the use of soluble aspirin and 43.10% enteric coated. 91.37% were familiar with ECG findings of MI. As latest treatment of choice 41.37% thought of immediate thrombolysis with tenecteplase whereas 47.41% considered coronary angiogram followed by angioplasty in a nearby cardiac center and 29.74% immediate thrombolysis with streptokinase. Regarding referral to hospital with catheterization laboratory facility, 65.94% opined 3 hours as maximum time period of referral from onset of attack of MI and 43.96% opined it to be 6 hours.

Conclusions: Family practitioners play a key role in timely management of acute MI. Hence updating them on the management of acute MI through various continuing medical education programs is considered mandatory so that timely management can help significantly reduce mortality rates in our country.

Keywords: Myocardial infarction, Family physician

INTRODUCTION

Myocardial infarction (MI) is the most common cause of mortality globally. A survey reveals that during the past few years the incidence of MI has reduced in western countries, but an increase has been observed in developing countries especially in India.¹ It has been documented that as much as 25% of patients who develop MI succumb before reaching tertiary health care centers.

Therefore, the present slogan of cardiologists regarding management of MI is "Time is Myocardium". If prompt treatment/referral is initiated within 90 minutes of the development of infarction, the mortality rate can be minimized almost to 3%.² Whenever patients develop any acute illness including MI, they attend the clinics of family physicians first as these are easily accessible to them. Hence, the role of family physicians in the management of MI is very significant. Appreciating the

value of time and having an updated knowledge of management of MI, can help family physicians make immediate referral decisions and save lives of patients. Family physicians are often misled by the history provided by patients that their spicy food consumption led to indigestion and chest discomfort. Apart from this, any patient with chest pain should have an ECG which can mostly diagnose MI. Unfortunately, most of the patients are reluctant to undergo ECG and request the family physicians to treat them with empirical injections and inform them that they will subsequently undergo ECG. Unfortunately, a significant proportion of these patients succumb before they return on the next day. Thus, the family physicians are to some extent

responsible for delay in treatment of MI and need to compel these patients to take ECG immediately which is affordable and easily accessible. It is also important that the treating family physicians should have knowledge of diagnosing MI from ECG so that they can initiate appropriate management.

Unless they are aware of the update in management of MI such as immediate thrombolysis, angiogram followed by angioplasty, they may not be able to refer the patients in appropriate time. It was felt that a survey should be conducted on the line of management of MI by the primary health care physicians and hence the present survey has been undertaken.

Table 1: Survey questionnaire.

Questions	Responses
Symptoms of myocardial infarction	Chest pain
	Sweating
	Shortness of breath
	Shoulder pain
	Dizziness
	Palpitation
Familiar with ECG findings of MI	Yes
	No
ECG changes suggestive of MI	ST elevation
	ST depression
	T wave inversion
	Q wave appearance
	Bundle branch block
Is morphine used in your clinic for acute MI	Yes
	No
If NO, alternate analgesic used in your clinic	Aspirin
	Tramadol
	Diclofenac
	Paracetamol
	Pethidine
Reason for non-stocking of morphine in your clinic	Non availability
	Abuse/misuse
	Narcotic drug
	Legal issues
	Toxicity and side effects
Is Aspirin used in your clinic for acute MI	Yes
	No
If, YES, the type of Aspirin used	Soluble
	Enteric coated
In your opinion the latest treatment for MI is	Immediate thrombolysis with streptokinase
	Coronary angiogram followed by angioplasty in a nearby cardiac center
	Referral to a corporate hospital with all facilities irrespective of distance
	Immediate thrombolysis with Tenecteplase
In your opinion what is the maximum period for the referral of patient to catheterization laboratory for angiography followed by angioplasty.	Within 32 hours of the attack
	Within 6 hours of the attack
	Within 12 hours of the attack
	Within 24 hours of the attack

METHODS

This was a cross-sectional survey conducted with a validated questionnaire among 232 family physicians from February 2019 to July 2019.

The questionnaire was administered to 232 practicing family physicians randomly selected in city of Raipur and Indore. The statistical analysis was done using SPSS tool. The salient features of the questionnaire (Table 1) included the information regarding. Familiarity with symptoms and ECG findings of MI. First line medication to be prescribed by them for suspected MI. Use of morphine/alternate drug to morphine. Use of aspirin and formulation of aspirin used. Knowledge of latest treatment of MI. The practicing physicians were explained about the purpose of the study and informed consent was obtained. They were requested to complete the questionnaire and return it immediately. The data were analyzed and presented in the results.

RESULTS

The demographic data of the surveyed physicians is presented in Table 2.

Table 2: Demographics of the surveyed physicians.

Parameters	Raipur	Indore
Number of doctors surveyed	131	101
Average number of years in practice	8	9

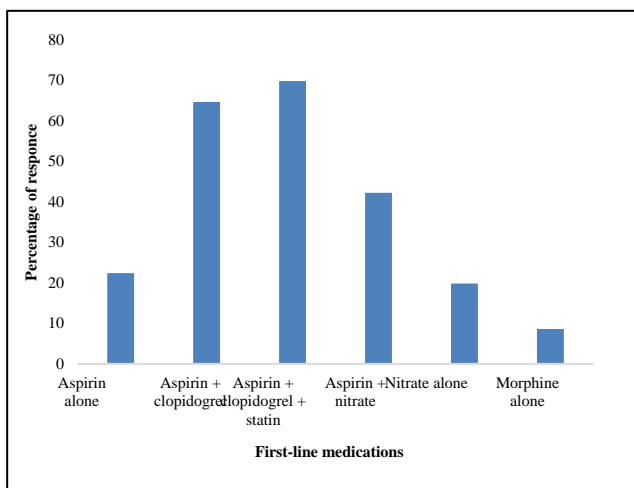


Figure 1: Medications preferred by GPs as first-line treatment.

Aspirin was the most commonly preferred medication by the physicians as first-line treatment (Figure 1) Combination of aspirin, clopidogrel and statins was the treatment of choice by 69.82% of physicians. Use of morphine was not preferred by 87.93% of physicians due to non-availability. Tramadol, diclofenac and pethidine were the analgesics preferred. Use of aspirin was stressed

by 91.37% of physicians, of these 56.89% preferred the use of soluble aspirin and 43.10% enteric coated. 91.37% were familiar with ECG findings of MI.

As latest treatment of choice 41.37% thought of immediate thrombolysis with tenecteplase whereas 47.41% considered coronary angiogram followed by angioplasty in a nearby cardiac center and 29.74% immediate thrombolysis with streptokinase. Regarding referral to hospital with catheterization laboratory facility, 65.94% opined 3 hours as maximum time period of referral from onset of attack of MI and 43.96% opined it to be 6 hours (Table 3).

DISCUSSION

The results reveal that 22.41% of the primary care physicians preferred aspirin alone as first line medication for patients highly suspicious of MI. The choice to add clopidogrel along with aspirin was 64.65%, nitrates with aspirin was 24.24% and clopidogrel and statins with aspirin were 69.82%. In all the three regimens’ aspirin found a place. Only 8.62% of physicians preferred morphine alone whereas 19.82% preferred nitrates alone. It has been observed and suggested that administration of aspirin alone within 3 hours of occurrence of MI reduces the mortality rate in MI by 23% and it is considered that the effect of timely administration of aspirin is almost equal to the effect of streptokinase.³ It is interesting to note that more than 91.37% of physicians wanted to include aspirin as a primary drug with various combinations indicating their awareness of the lifesaving value of aspirin in management of MI.

Regarding use of morphine for MI patients in the clinic, 12.08 % of physicians answered that they used morphine and the remaining 87.93% were not using this drug. The main reason for not using morphine by majority of physicians was essentially identified as non-availability of morphine. In addition to this, they did not want to face legal issues because the drug falls under the classification of narcotic and psychotropic substances. It is unfortunate that even though morphine is the most effective analgesic and by relieving pain it reduces the sympathetic activity, a vital role in management of MI, patients are deprived of the benefits of morphine due to the stringent drugs act in our country.

In view of non-availability of morphine, 59.80% of physicians preferred to use tramadol as the primary analgesic. Tramadol is being used now as an alternative to morphine for treatment of post-traumatic pain but its safety of use in acute MI is not yet clearly understood.⁴ Further, 12.25% of physicians preferred pethidine. However, pethidine is also not easily available. Surprisingly 49.50% of family physicians answered they use aspirin as alternative analgesic to morphine. Aspirin acts as analgesic at an ulcerogenic dose of 0.5 to 1 gm. It acts as an anti-platelet agent at a dose of 150 to 300 mg.

Table 3: Responses to questionnaire.

Questions	Responses	n (%)
Symptoms of myocardial infarction	Chest pain	232 (100)
	Sweating	228 (98.27)
	Shortness of breath	230 (99.13)
	Shoulder pain	210 (90.51)
	Dizziness	120 (51.72)
	Palpitation	173 (74.56)
Familiar with ECG findings of MI (n=232)	Yes	212 (91.37)
	No	20 (8.62)
ECG changes suggestive of MI (n=212)	ST elevation	212 (100)
	ST depression	201 (94.81)
	T wave inversion	93 (43.86)
	Q wave appearance	65 (30.66)
	Bundle branch block	25 (11.79)
	P wave inversion	22 (10.37)
Is morphine used in your clinic for acute MI	Yes	28 (12.08)
	No	204 (87.93)
If NO, alternate analgesic used in your clinic (n=204)	Aspirin	101 (49.50)
	Tramadol	122 (59.80)
	Diclofenac	92 (45.09)
	Paracetamol	56 (27.45)
	Pethidine	25 (12.25)
Reason for non-stocking of morphine in your clinic	Non availability	210 (90.51)
	Abuse/misuse	191 (82.32)
	Narcotic drug	130 (56.03)
	Legal issues	195 (84.05)
	Toxicity and side effects	85 (36.63)
	Don't want to take risk	154 (66.37)
Is Aspirin used in your clinic for acute MI	Yes	212 (91.37)
	No	20 (8.6)
If, YES, the type of Aspirin used	Soluble	132 (56.89)
	Enteric coated	100 (43.10)
In your opinion the latest treatment for MI is	Immediate thrombolysis with streptokinase	69 (29.74)
	Coronary angiogram followed by angioplasty in a nearby cardiac center	110 (47.41)
	Referral to a corporate hospital with all facilities irrespective of distance	12 (5.17)
	Immediate thrombolysis with Tenecteplase	96 (41.37)
In your opinion what is the maximum period for the referral of patient to catheterization laboratory for angiography followed by angioplasty.	Within 3hours of the attack	153 (65.94)
	Within 6 hours of the attack	102 (43.96)
	Within 12 hours of the attack	30 (12.93)
	Within 24 hours of the attack	3 (1.29)

If it is given in higher dose its anti-platelet property may be lost and the purpose of using it in MI becomes meaningless. Further its analgesic potency cannot be compared with morphine to be used in MI. Injection diclofenac was chosen as alternative analgesic to morphine by 45.09 % of physicians. Diclofenac is a non-steroidal anti-inflammatory drug useful in musculoskeletal pain and not in severe visceral pain; further the drug itself may reduce the anti-platelet activity of aspirin. Moreover, patients with MI are exposed to maximum stress leading to peptic ulcer. Diclofenac per se can either induce or potentiate the ulcer. The above discussed data warrants an urgent need for updating the

analgesic use in MI by the primary care physicians. Regarding the type of formulation of aspirin used for MI, 56.89% of physicians answered that they use soluble aspirin while 43.10% use enteric coated aspirin. As already pointed above, timely administration of aspirin reduces the mortality in MI significantly. For this purpose, only soluble aspirin which dissolves immediately must be given so that it can be absorbed rapidly. In contrast, if enteric coated aspirin is used it might take minimum 3-4 hours for absorption and to reach effective concentration in plasma.^{5,6} Hence, the practicing family physicians should be aware of the

differences in the absorption of these two preparations of aspirin and prescribe accordingly.

It is good to note that 91.37% of practicing physicians are familiar with the ECG finding of MI, as ECG is the most effective, simple, and cost-effective investigation for guiding on the line of management of suspected chest pain.

Reperfusion therapy in the form of primary percutaneous coronary intervention (PPCI) has become the gold standard for treatment of acute MI.⁷ As “Time is Myocardium” in the management of MI, timely referral to appropriate center is paramount. Further, PPCI performed within 3 hours gives excellent results and PPCI performed after 3 hours has not yielded gratifying results. PPCI performed after 12 hours is of doubtful value. In the present survey, 47.41% of the family physicians favored PPCI; thrombolysis with streptokinase was considered as the latest treatment by 29.74%. Only 5.17% primary care physicians believed patient to be referred to a corporate hospital with excellent facilities for cardiac surgery, irrespective of distance.

The suggested guidelines in a country like India on the management of MI is as follows: where facilities available to transport the patient within 3 hours to catheterization laboratory, patient should be referred for PPCI. If no such facilities are available, immediate thrombolysis with tenecteplase should be preferred modality of treatment now. Streptokinase is widely used now in India for thrombolytic therapy; however occluded infarct related arteries had opened in 31% of patients only who were treated with streptokinase, whereas the percentage was 62% in case of tenecteplase.⁸ Further tenecteplase was found to be more efficacious than streptokinase in preventing cardiogenic shock which is a serious complication of MI.⁹ On the other hand, one vial of tenecteplase much more costly in contrast to streptokinase. However, MI is a killer disease and when life is lost by MI, it is not the loss of single individual but the whole family suffers especially when the victim is the bread winner of the family. Hence on considering the family as a whole there should be no hesitation to use tenecteplase especially when facilities for PPCI are not available. In the present study only 41.37% of the physicians felt that tenecteplase should be the latest treatment.

In the management of MI, the family physicians should be aware of the fact that patient should be referred within 3 hours of the attack of MI to a nearby cardiac center with catheterization laboratory facilities and not to a corporate hospital with all modern facilities but situated some 300 to 400kms away which takes about not less than 5 to 6 hours of travel to reach the hospital.

It is estimated that PPCI is available in <25% of hospitals even in U.S.A.¹⁰ These facilities may be available in <10% of hospitals in India. Under these circumstances it

appears that in India thrombolytic treatment despite its short coming is the preferred initial therapy.

The thrombolytic agents available are streptokinase and recombinant tissue-type plasminogen activator (rtPA) such as alteplase and tenecteplase. As already mentioned, compared to other thrombolytic agents streptokinase is least costly but clot dissolution occurs more promptly with tenecteplase and alteplase.¹¹ Further it has lower incidence of bleeding and mortality rate compared to streptokinase.¹² Alteplase and streptokinase must be given through continuous IV infusion for 90 minutes and 60 minutes respectively which need supervision by an experienced physician, whereas tenecteplase is given as 5 second IV bolus.¹³ Tenecteplase has even been suggested as a pre-hospital thrombolytic agent by primary health care physicians.¹⁴ The present survey revealed that only 41.37% of physicians are aware about the use of tenecteplase for immediate thrombolysis and its ease of administration.

Regarding maximum period to refer to a catheterization laboratory, 65.94% of physicians opted within three hours, 43.96% opted within 6 hours, and 12.93% opted within 12 hours. It is interesting to note three physicians were on the opinion that 24 hours is maximum time. Now it is well established that patients with MI should have PPCI within 90 minutes of arrival to the hospital to get maximum benefit.¹⁵ Further timely reperfusion therapy has shown that long-term mortality rate in patients with M.I is 15.4% when reperfusion therapy is started within 60 minutes and this mortality doubles to a rate of 30.8% when the reperfusion therapy is started after more than 180 minutes.¹⁶ Hence, we feel that training programs may be arranged for family physicians focusing the value of time in management of MI.

Limitations of the study include the fact that it was undertaken in a small geographical area and was conducted with a small sample size.

CONCLUSION

Family practitioners play a major role in early management of acute MI. Most of the patients consult the family physicians first since they usually know them well. The family physicians should be able to suspect acute MI and diagnose from ECG and initiate early treatment/ referral, so that lives of many patients may be saved. Proper advice and correct timely directions certainly can reduce the mortality and morbidity in MI. Our present survey revealed that though the family physicians are well versed with the ECG, an important investigation, awareness program pertaining to use of analgesics, referral time to PPCI, use of correct thrombolytic- as a whole on the current strategies of management of MI be organized. Professional bodies like Indian Medical Association, Association of Family Physicians, government general hospitals and corporate cardiac centers can play a major role in updating the

knowledge of family physicians by arranging continuing medical education programs and refresher courses, which is the need of the hour.

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