Students' Corner

General Practitioner's Knowledge regarding the Diagnosis and Drug Therapy for Acute Myocardial Infarction

Zaman Shah,[1] Munsif Ali,[2] Islam Hussain,[3] Saadia Zohra Farooqui,[4] Anita Naushir Akbar Ali,[5] Ailia Welayat Ali,[6]
Fazal Manzoor Arain,[7] Salman Saleem Allana,[8] Shadmeen Rafique Aarabi,[9] Salman Fasih Khan,[10]
Mansoor Arif,[11] Saad Siddique,[12] Majid Shafiq,[13] Amyn B. Lakhani[14]

Final Year Medical Student,[1-13] Department of Community Health Sciences,[14] The Aga Khan University, Karachi, Pakistan.

Abstract

Objective: To assess the general practitioners (GP) knowledge regarding the diagnosis and initial drug therapy for acute myocardial infarction (AMI).

Methods: A questionnaire-based survey was conducted in randomly selected GPs of Karachi. Doctors working in community as GPs who were registered medical practitioners having a Bachelor of Medicine & Bachelor of Surgery degree were included in the study. Doctors working at tertiary care facilities or having a post graduate degree or post graduate training in a specialty other than family medicine were excluded from the study.

Results: A total of 186 GPs participated in our study. GPs who studied research journals were 2.33 times more likely to investigate serum cardiac troponins levels for the diagnosis of AMI compared to those who did not study research journals (P = 0.02). Twenty six percent of the GPs said that they would refer a patient with suspected AMI without treatment, while 76% said that they would consider some treatment prior to referral. Fifty eight percent of the GPs identified ST segment elevation myocardial infarction (STEMI) of <12 hours duration as an indication of thrombolysis while 28% identified posterior wall AMI as a thrombolytic indication.

Conclusion: GPs, although adequately aware of the presenting features of AMI, were lacking in knowledge regarding the means for confirmation of diagnosis, initial drug therapy and were less likely to carry management steps in their practice (JPMA 59:118; 2009).

Introduction

Coronary Artery Disease (CAD) has become a leading contributor to morbidity and mortality in most countries.[1] Its rise of epidemic proportions in the developed countries has been well documented.[2] But the emergence of this epidemic in the developing countries during the past two to three decades has attracted lesser comment and public health response, even within the healthcare enterprises of these nations. It is not commonly realized that at present, the developing countries contribute a greater share to the global burden of CAD than the developed countries.[1] Although this high burden of CAD deaths in itself warrants attention, a greater cause for concern is the early age of CAD deaths and the projected rise in CAD mortality rates in the developing world over the next 25 years.[3]

The majority of patients in Pakistan present to their local General Practitioner (GP) for most medical complaints.[4] Patients prefer GPs as they are easily accessible and probably because of

continuity of care. For much of the population, GPs form a vital triage point for medical emergencies such as acute myocardial infarction (AMI). Thus, it is of the essence that they must be prompt and accurate in recognition of these cases and administration of appropriate initial therapy before swift referral.

Questions regarding GPs' knowledge of the pre-hospital management have been addressed in the developed world;[5,6] their findings suggested that the management practices of GPs vis-à-vis AMI were not in cognizance with national and international guidelines in entirety. In view of the even more crucial role that GPs in Pakistan play in determining the initial management and consequently long-term outcome following an AMI, we aimed to assess their knowledge of the diagnosis and initial pharmacological management regarding the same. To our knowledge, no such study has been published to date from Pakistan.

Methods

Doctors working in the community as GPs who were registered medical practitioners having a Bachelor of Medicine

population. Essential alterations were made in the questionnaire based on the results of the pilot study. Data were analyzed using SPSS version 13 for Windows. Chi-square test was employed to test association between various categorical variables.

The project was reviewed and approved by the Ethical Review Committee of the Aga Khan University. Informed written consent was obtained before administering the questionnaire. Participants' confidentiality was maintained; names were not asked and data was only available for research and publication purposes. Additionally, the data obtained were grouped before being subjected to analysis as against analyzing individuals separately.

Results

A total of 186 GPs participated in our study. Out of these 119 (64%) were males and 67 (36%) were females. Thirty percent of the respondents had attended a seminar, symposium or workshop on the diagnosis and management of AMI in the six months immediately preceding this study.

Table 1 illustrates the classic symptoms and

Table 1: Symptoms and ECG changes suggestive of AMI identified by the respondents.

Symptoms of AMI identified by the respondents			ECG changes suggestive of AMI identified by the respondents		
	Number of GPs	%age of total		Number of GPs	%age of total
Chest pain	186	100	ST Elevation	159	85
Sweating	168	90	ST Depression	84	45
Shortness of breath	145	78	T wave inversion	77	41
Shoulder pain	130	70	Q wave appearance	76	41
Palpitations	108	58	New onset bundle branch block	44	24
Weakness/ Dizziness	71	38	P wave inversion	17	9

& Bachelor of Surgery degree were included in this study. Doctors working at tertiary care facilities or those having a post graduate degree or post graduate training in a specialty other than family medicine were excluded.

The sample size was calculated using Epi Info Version 6 considering a 95% level of confidence, assumed minimum prevalence of 10% since no study had been done on the target population, the power of the study being fixed at 80%. Thirty one GPs were conveniently chosen from each of the six towns of Karachi that were randomly selected, making a total of 186. A cross sectional survey was carried out, wherein a self reported questionnaire was administered to the study participants.

Existing literature regarding the diagnosis and management of AMI and GPs' knowledge regarding AMI was extensively reviewed. This helped us identify variables for the development of the questionnaire. Questions were centered on key aspects of the clinical presentation, diagnosis, and management of AMI along with the demographic data of the participants. The questionnaire was pre-tested on 20 conveniently selected GPs, which is >10% of the target

Electrocardiographic (ECG) changes suggestive of AMI identified by the respondents

In reply to the question, "what is silent myocardial infarction (SMI)?" 92% of the respondents chose AMI with no chest pain, 4.8% chose chest pain due to non-cardiac causes while the remaining 3.2% chose AMI that made a patient silent. Eighty four percent of the GPs stated that diabetics were more likely to get SMI. Twenty-eight perccent said hypertensives were more likely while another 20% stated that patients with a past history of AMI were more likely to get an SMI.

Figure 1 illustrates the lab tests essential for establishing the diagnosis of AMI identified by the respondents. GPs who studied research journals were 2.33 times more likely to investigate cardiac troponins levels in the serum for the diagnosis of AMI compared to those who did not study research journals (P = 0.02).

Twenty six percent of the GPs said that they would refer a patient with suspected AMI without treatment, while 76% said that they would consider some treatment prior to referral. Nitroglycerine and Asprin were the two most commonly considered medications before referral. Female GPs were four
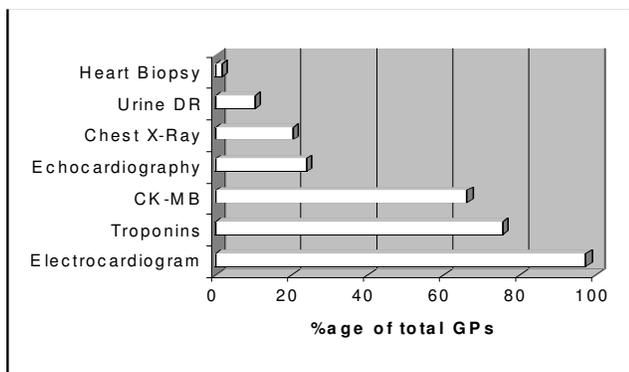
Figure 1: Lab tests essential for establishing the Diagnosis of AMI identified by the respondents.

times more likely to refer a patient with suspected AMI without treatment compared to male GPs (P < 0.01).

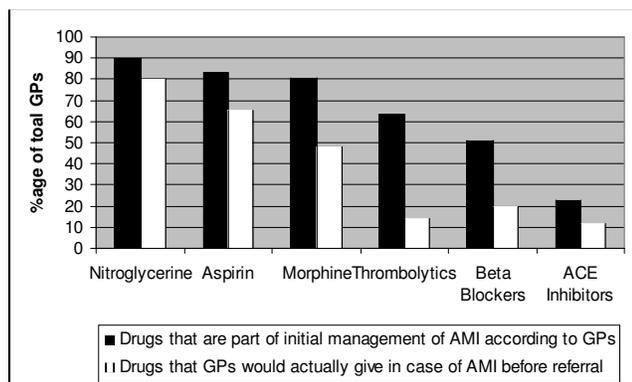Figure 2 illustrates the differences between knowledge

Figure 2: Drugs that are part of the initial pre hospital management of AMI according to GPs (black bars) and drugs that GPs would in practice give before referral to a patient with AMI (white bars).

and practices of GPs regarding initial drug therapy for AMI.

GPs were asked to identify the indications and contraindications for thrombolysis Fifty eight percent of the GPs identified ST segment elevation myocardial infarction (STEMI) of <12 hours duration as an indication of thrombolysis while 28% identified posterior wall AMI with dominant R waves and ST depression in leads V1-V3 as an indication. Forty seven percent of the GPs considered pregnancy as a contraindication for thrombolysis.

Sources of GPs' knowledge included: books (87%), fellow doctors (61%), seminars/ workshops (57%), and Research Journals (43%). Possible ways identified by GPs to improve their knowledge were: Seminars/ Symposia/ Workshop (82%), Newspapers and Magazines (40%), Television (29%), and others, including provision of research journals and regular exams (4%).

Discussion

GPs demonstrated adequate knowledge of the presenting features of AMI. Such patients usually present with chest pain, shortness of breath, sweating, and palpitations.[7,8] Respondents in our study largely identified these presenting symptoms. A good majority of GPs also knew about silent MI, and also that diabetics were more likely to get it.

Serum Cardiac troponins (cTnI, cTnT) are a gold standard for the diagnosis of AMI and have been recommended as an essential component in the recent re-definition of AMI by The Joint European Society of Cardiology/ American College of Cardiology Committee.[9] In our study, however, one fourth of the GPs did not consider serum troponin levels as an essential test for the diagnosis of AMI. A significant difference existed in knowledge about cardiac enzymes between GPs who used research journals as a knowledge source and those who did not, suggesting that readers of research publications are better aware of the advancements in knowledge about AMI.

ECG remains a fundamental tool in the diagnosis and management of AMI. An analysis of ECG patterns helps implicate the infarct-related artery, predicts the amount of myocardium at risk and recognizes new conduction abnormalities and arrhythmias, which in turn influence decisions regarding the use of reperfusion therapy.[10] In our study, an encouraging number (97.3%) of GPs considered ECG as an essential test to diagnose AMI. But the deficiencies in knowledge about the proper interpretation of ECG are alarming. The fact that 15% of the respondents did not know that AMI could be a cause for ST elevation is concerning because these patients can definitely benefit from timely reperfusion. ST segment depression (STD) can represent subendocardial ischaemia and infarcts or frank posterior wall infarctions.[7] But, disappointingly, more than half of our respondents did not know that STD could be a manifestation of AMI. An even lower number of GPs knew that newly appearing Q waves and new onset conduction abnormalities on ECG could be an indication of AMI.

This lack of knowledge about ECG interpretation is not limited to our population of GPs. Studies performed on family medicine residents in the United States and United Arab Emirates have also demonstrated a suboptimal knowledge suggesting that difficulty in ECG interpretation transcends geographic boundaries.[11,12]

According to the British Heart Foundation's guidelines for early management of patients with AMI, the role of the GP includes rapid diagnosis of patients with chest pain, provision of adequate analgesia, aspirin, GTN and beta-blockers, initiation of treatment for complications and expedition of eventual reperfusion therapy.[13] A proportional

reduction in 1-year mortality of 22% has been calculated for acute coronary syndrome when the guidelines are followed.[14]

About a quarter of the respondents in our study stated that they would consider referral without giving any treatment in a cost of suspected AMI. This could be because of the fact that not all the GPs have ECG machines in their clinics and no therapy could be initiated without evaluating the ECG of the patient. In such cases it seems more rational a decision to consider early referral. The questionnaire did not specifically ask for the availability of ECG machines at the GPs clinics.

Prompt analgesia is essential after a brief assessment of any patient suspected of having an AMI. The guidelines propose that GPs should give opioids intravenously for analgesia as well as for their anxiolytic effect.[13] Studies have advocated the need for morphine administration in patients with suspected or definite AMI.[15,16] Although many GPs (78%) in our study identified morphine as part of the initial management of AMI, less than half said that they would actually prescribe it in a suspected case of AMI. This discrepancy could be because of the fact that GPs in Karachi are unlikely to have morphine in their clinics for use.

The role of aspirin in the management of suspected AMI has been well established.[17,18] The GP is in an ideal position to administer this clearly beneficial therapy to the patients. According to a Sri Lankan study, few patients with AMI had been given early aspirin therapy. Only a minority of GPs were aware of the benefits of early aspirin therapy in AMI, and very few prescribed it.[19] Moher et al noted that only one fifth of patients presenting with acute chest pain received aspirin before admission.[20] All these findings are consistent with our results which exhibit sub optimal utilization of aspirin despite adequate knowledge.

The early use of beta blockers in acute MI is associated with a reduced risk of re-infarction and ventricular fibrillation but an increased risk of cardiogenic shock.[21] Despite this proven cardioprotective effect, a considerable number of our study participants were not aware of its use and an even smaller number prescribed it. These results are in parallel with the findings of John Z et al who found only 51% of the family physicians to be aware of the benefits of beta-blockers in cases of AMI.[5]

Various studies have shown that thrombolysis initiated by GPs showed clear and significant reductions in both mortality and markers of left ventricular damage.[22-24] Hannaford et al showed that GPs can use anistreplase both appropriately and safely in the early management of AMI.[25] A survey by Round A et al suggests that GPs, although well informed about it, do not wish to administer thrombolysis themselves.[6] We observed a similar discrepancy in the knowledge (62%) and practices (14.5%) of our study population regarding thrombolytic therapy. An important reason for this is that GP's clinics in Karachi may not be appropriately equipped to initiate treatments like thrombolysis. Under such circumstances timely referral to a hospital may be the only way to save lives. Furthermore, the inaccurate knowledge regarding its indications and contraindications could mean that a substantial number of patients who could benefit from thrombolysis may not be administered thrombolytics or referred for it.

Conclusions

In light of the observations made in our study, it becomes apparent that GPs are lacking adequate knowledge regarding some crucial aspects of AMI diagnosis and initial drug therapy. This is alarming because timely identification and administration of appropriate initial treatment determines the morbidity and mortality associated with AMI.

We recommend that educational activities like seminars, symposia, and workshops should be organized on a regular basis in order to improve and update GPs' knowledge about AMI. We also advise that all future seminars and CME sessions be organized with the aim of maximizing female GP participation as their knowledge was significantly lower in some crucial areas such as the decision to institute initial therapy before referral in the setting of an AMI. Furthermore, our study showed that GPs who read medical journals were better aware of the recent developments regarding AMI. Hence, it is suggested that relevant articles from leading research journals should be made available to all GPs.

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