

# A single-center prospective study analyzing the cardiac referrals made to a tertiary care center in India

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## ABSTRACT

**Background:** Healthcare system in most parts of the world functions on a three-tier system, involving primary, secondary, and tertiary care centers. The appropriate and efficient referral system plays crucial role in maximally efficient healthcare delivery. **Materials and Methods:** In all, 46 referrals made to the medicine department of the hospital over a period of 1 month with chief complaint of chest pain and presumptive diagnosis of myocardial ischemia/infarct by outside physicians were selected randomly. Analysis was done both for extent and clarity of useful information provided. **Results:** Out of 46 referrals, exact indication for referral was mentioned in 4 (8.7%), time of referral in 2 (4.3%), blood pressure in 38 (17.4%), pulse rate in 29 (63.04%), respiratory rate in 1 (2.17%), electrocardiograph diagnosis was not mentioned in 12 (26.08%), and the contact number/details of referring physician were mentioned in 2 (4.34%). Correct dose of aspirin was given to 27 (58.69%), clopidogrel to 19 (41.30%), statins to 9 (19.45%), angiotensin-converting enzyme inhibitors to 6 (13.04%), beta-blockers to 8 (17.39%), low-molecular weight heparin in 6 (13.04%), and 22 (47.82%) patients warranted thrombolysis, but was given in 12 (54.54%). **Conclusions:** There is a serious lack of quality and clarity of important information provided while making referrals.

**Key words:** Acute coronary syndrome, cardiac, referral, tertiary care

## INTRODUCTION

Healthcare system in most parts of the world functions on a three-tier system, involving primary, secondary, and tertiary care centers. Each of these plays a crucial role in healthcare delivery to the community. These centers must function in collaboration rather than independent of each other to provide optimum health care. Tertiary care centers deserve a special mention because they not only see their own patient but also provide supportive healthcare service to the referrals made to them by other centers. The

appropriate and efficient referral system plays a crucial role in maintaining this collaboration and dependence on each other for maximal efficient healthcare delivery.

Referrals are essentially made by the physicians from both private- and government-run primary and secondary care centers when they find the patient's condition out of the scope of their expertise or requiring advanced investigational work-up or patient with a serious condition requiring advanced medical care not available at their centers.<sup>[1]</sup> The quality of referrals made is quite important in this aspect as they serve to provide the physicians with background knowledge about patient and assist them in their further management of the patients. A good-quality referral helps to save a lot of crucial time that would have been spent in initial work-up of the patient and a bad-quality referral adds to the burden of physicians at tertiary care center, specifically, and health care system and expenditure in general.

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Although various research studies have been done in the west judging and analyzing the appropriateness of the referrals made,<sup>[2-5]</sup> little knowledge is available in literature with regard to quality and clarity of information provided while making referrals to higher centers. Studies have been done in past in India, a developing country, to examine the nature and distribution of referrals with respect to different subspecialties and their outcome,<sup>[6,7]</sup> but we could not find any study done anywhere analyzing the quality of referrals made to a tertiary care center, even after extensively searching the Pubmed and Medline database to the best of our ability. There was no study in literature analyzing the referrals for acute coronary syndrome.

Therefore, we planned to study and analyze the quality of cardiac referrals made to a tertiary care center in Indian setup by both primary and secondary health care centers. The study was important in context that a good-quality referral saves a lot of time and effort by already overburdened physicians at tertiary care center and has direct impact on improving the morbidity and mortality rates of the patients.

## MATERIALS AND METHODS

This study was carried out in a government-run tertiary care center in New Delhi which caters to a large population in Delhi and western Uttar Pradesh. Patients are referred to this hospital from a large number of primary and secondary care centers for a diverse variety of medical ailments and for further advanced management of the patients. In all, 46 referrals made to the medicine department of the hospital over a period of 1 month with chief complaint of chest pain and presumptive diagnosis of myocardial ischemia/infarct by outside physicians were selected randomly by us for this study. Referrals made both to the outpatient services and emergency services were considered appropriate. Referrals were then studied and analyzed for information provided by referring physician on referral sheet on a variety of parameters. Analysis was done both for extent and clarity of useful information provided. Only those parameters that were considered medically relevant to the case and thought to be helpful and required for further management of the patient were considered. Detailed history and physical examination, not relevant to the immediate care, were not considered while checking for the appropriateness of the referral.

The parameters that were thought to be essential in a referral and analyzed in study included mention of referring institution, indication and time of transfer, vitals at time on

transfer (blood pressure, pulse rate, respiratory rate, and temperature), diagnosis mentioned, electrocardiograph (ECG) report/findings, and name and contact of referring physician. ECG, if attached, were studied and checked for accuracy of reporting the result. Initial management given and its rationale were also studied.

## RESULTS

Out of the 46 referrals analyzed for study, 24 (52.17%) were of males and 22 (47.82%) were of females. The average age of patient was 48.23 years with range from 28 to 63 years.

Out of 46 referrals, 18 were made by private centers and 28 were made by government-run centers. The exact indication for referral was mentioned only in 4 of 46 (8.7%), while it was not mentioned in 27 of them (58.69%) and was not clear in 15 of them (32.6%). Time when referral was made was mentioned in only 2 of 46 (4.3%) and was not mentioned in 44 of them (95.7%).

Regarding the vitals, blood pressure at time of referral was mentioned in 38 of them but not in other 8 (17.4%). Pulse rate was mentioned on referral sheet in 29 referrals (63.04%) and was lacking in other 17 referrals (36.96%). Respiratory rate was mentioned in only one referral (2.17%) and other 45 (97.83%) referrals lacked it. Temperature at time referral was made was noted in only three patients (6.52%) and was not mentioned in other 43 (93.47%).

Out of 46 referrals, ECG findings were not mentioned in 13 referrals (28.26%). In those where findings were mentioned, diagnosis was not mentioned in 12 (26.08%), correctly mentioned in 10 (21.73%), incorrectly mentioned in 11 (23.91%). Out of 46 referrals, 44 (95.65%) patients were ultimately diagnosed as cases of cardiac chest pain (acute coronary syndrome) and 2 (4.34%) patients after evaluation were diagnosed as cases of noncardiac chest pain. Because the number of patients with noncardiac chest pain was very less, no significant comparison could be made between both groups.

The name of referring physician was clearly mentioned in 10 of 46 referrals (21.73%) and was not mentioned in 32 of them (74.41%). It was not clearly mentioned in other four referrals (8.69%). The contact number/details of referring physician were mentioned in only 2 of 46 referrals (4.34%).

Regarding initial management, correct dose of aspirin (162–325 mg) was given to 27 of 46 patients (58.69%) and in other 3 incorrectly higher dose of aspirin (6.52%) was given. In other 16, aspirin was not given at all (34.78%).

Clopidogrel (300–600 mg) was given in correct dose to 19 of 46 patients (41.30%) and in other 3 (6.52%) incorrect doses were given, while in remaining 24 it was not given at all (52.17%). Statins were started in only 9 (19.45%) patients and was not given in other 37 (80.43%) patients. Angiotensin-converting enzyme (ACE) inhibitors were started in only 6 (13.04%) patients and were not started in other 40 (86.95%) patients. Beta-blockers were initiated in only 8 (17.39%) patients and not in other 38 (82.60%) when no contraindication was present. Low-molecular weight heparin was given in only 6 (13.04%) patients and not in other 40 (86.95%) patients [Table 1]. Other drugs initiated were nitrates in 27 (58.69%) patients, opiates in 14 (30.43%) patients, antihistamines in 9 (19.56%) patients, and proton pump blockers in 4 (8.69%) patients.

Certain referrals contained evidence of erroneous management, for example, usage of theophylline to treat the wheeze which was clearly a result of acute heart failure, and in another case use of amiodarone in hemodynamically unstable ventricular tachycardia. Out of the 46 cases, 22 (47.82%) patients referred warranted thrombolysis, but only in 12 of 22 (54.54%) of them thrombolysis was initiated.

## DISCUSSION

Our study made it clear that there is a serious lack of quality and clarity of important information provided when it comes to referrals made to a tertiary care center in Indian setup. Most of the referrals studied by us lacked even basic information that is crucially required for deciding the course of management of patient with myocardial infarction/ischemia such as the time of referral and exact indication of referral and even vitals were not uniformly reported in all the referrals. Furthermore, ECG findings were not reported by many and even reported erroneously by few of the referring physicians. It is a matter of serious concern that the contact details of referring physician were rarely provided in referral sheet in case of any urgent need while managing the patients. There was also lack of uniformity in initial management given to patients. There

was no significant difference with respect to data from private- and government-run centers.

Coulter<sup>[8]</sup> in his article suggests that a referral is appropriate and efficacious if it is timely in the course of disease and effective in achieving its objectives and cost-effectiveness. A study done by Grace and Armstrong<sup>[2]</sup> concluded that approximately 55% of hospital consultants across a range of different specialties felt that the general physicians could have done more before referring the patient. While in the western and European countries electronic means of storing data are quite common and the e-referrals ensure high quality of data sharing, the condition in developing countries is not great. It is of utmost importance that standard guidelines be recommended and implemented to ensure uniformities in the quality of referrals made. It will help to raise standard of health delivery to patients and healthcare services in greater perspective.

This study holds importance for two reasons: one, the data from India regarding the quality and clarity of information provided on referral sheet are virtually nonexistent and second, it is important to realize the shortcomings in information provided while making referrals and attempt should be made to reduce them for optimum and efficacious delivery of healthcare services. It is therefore proposed that an ideal referral must contain details including date and time of referral, name of the patient, and other details including age and sex and vitals at time of referral (blood pressure, pulse, respiratory rate, and temperature). The referral should mention a brief history, risk factors (including significant family history/Diabetes Mellitus/Hypertension/dyslipidemia/others), exact indication for referral, results of preliminary investigations done (Hb/Total Leukocyte Count/platelet/cardiac enzymes/chest roentgenogram/electrolytes/ECG findings), provisional diagnosis, and the treatment given. It is expected that all drugs given be mentioned including aspirin, clopidogrel, ACE inhibitors, beta-blockers, heparin/low-molecular weight heparin, thrombolysis, and so on. If any of these has not been administered, then the reason to withhold the drugs must be clarified.

However, our study had few limitations. The whole data for the study are from a single tertiary care center. It may not be a true representative of the country or even the state. In addition, the difference in outcome and impact on cost-effectiveness could not be assessed and compared between referrals with better information and other ones because of limitation of resources. A large-scale multicentric study will be needed to confirm these results in Indian setup. However, in spite of these shortcomings,

**Table 1: Showing number of referrals in which drugs were prescribed**

Drug	Given (out of 46)
Aspirin	30
Clopidogrel	22
ACE inhibitor	6
Beta-blocker	8
Low-molecular weight heparin	6

the study provides important evidence regarding a dire need to improve management and referral practices of patients with acute coronary syndrome.

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