

# Facilitators, Barriers, and Outcomes of Timely Treatment in Golden Hours for Patients with Myocardial Infarction at Selected Hospitals, Chennai

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## ABSTRACT

**Background:** Acute myocardial infarction (AMI) is a medical emergency and the most deadly presentation of coronary heart disease. The concept of golden hours is extremely crucial because most deaths and cardiac arrests occur during this period. Golden hours is a window of opportunity that has an impact on a patient's survival and quality of life.

**Aim:** This study aimed to assess the facilitators, barriers, and outcomes of timely treatment in golden hours for patients with myocardial infarction (MI).

**Materials and methods:** A descriptive correlational study design was carried out among 100 patients with MI at the selected tertiary care center, selected by consecutive sampling technique. The data collection was done using pretested and predetermined tools such as background variables pro forma, and checklist to assess the facilitators, barriers, and outcomes of timely treatment in golden hours for patients with MI.

The collected data were analyzed by using descriptive and inferential statistics.

**Results:** The study findings showed that there was a significant association between timely treatment and source of information on MI ( $\chi^2 = 5.555, p < 0.05$ ), history of hypertension ( $\chi^2 = 5.787, p < 0.05$ ), the outcome of a patient with MI such as survival rate of the patient ( $\chi^2 = 4.21$ ), need for medical management ( $\chi^2 = 2.68$ ), coronary artery bypass graft (CABG) ( $\chi^2 = 22.33$ ), percutaneous transluminal coronary angioplasty (PTCA) ( $\chi^2 = 9.071$ ), intra-aortic balloon pump (IABP) ( $\chi^2 = 11.26$ ), length of stay (LOS) ( $\chi^2 = 41.67$ ), recurrence of cardiac arrest ( $\chi^2 = 18.34$ ), and dysrhythmia ( $\chi^2 = 28.51$ ) at  $p < 0.05$  level.

**Conclusion:** Hence the study showed that delay in seeking treatment for MI symptoms limits the benefits of reperfusion therapies and influences the prognosis of treatment.

**Keywords:** Barriers, Comprehensive training program, Facilitators, Golden hours, Hospital-acquired infection, Intensive care unit nurses, Myocardial infarction, Outcomes, Timely treatment.

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## HIGHLIGHTS

A descriptive correlational study to assess the facilitators, barriers, and outcomes of timely treatment in golden hours for patients with myocardial infarction (MI) at selected hospitals, Chennai, Tamil Nadu, India.

## INTRODUCTION

Myocardial infarction is a serious health crisis that demands immediate management. Its early recognition followed by prompt emergency care, improves the patients' outcomes. Delay in seeking medical aid, after the onset of symptoms might impact the prognosis.<sup>1</sup> The necessity of an early diagnosis among those presenting with chest discomfort is becoming more widely recognized. Prehospital delay is the main obstacle to early reperfusion treatment, which is essential for preserving "at-risk" myocardial and lowering unfavorable cardiovascular events.<sup>2,3</sup> Only a small percentage of patients reach the hospital within the first hour of symptom onset, despite the fact that this window of time increases the patient's chances of survival. Prehospital delay is the main factor contributing to an increase in both early and late mortality in MI by increasing heart damage and decreasing the chances of survival.<sup>4</sup> Identifying the facilitators and

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barriers in seeking timely treatment among MI victims paves the pathway to formulation and regulation of policies of health care services in India to reduce the mortality rate due to delay in treatment among them. Evidence is limited on the facilitators and barriers of timely treatment in golden hours for patients with MI. Hence this study was aimed to assess the facilitators, barriers, and outcome of timely treatment in golden hours for patients with MI.

## OBJECTIVES

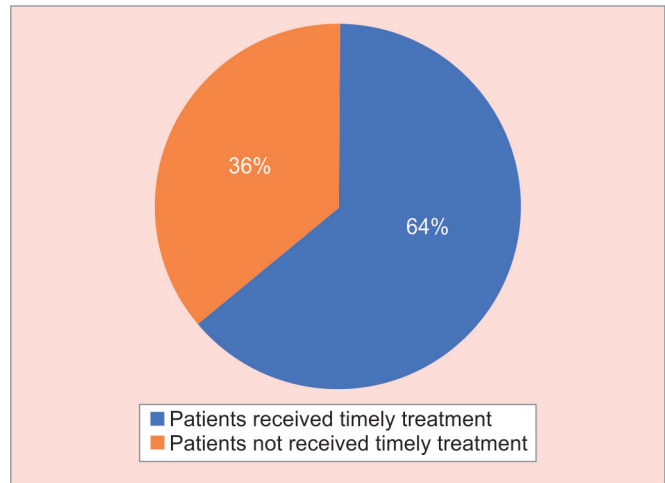
- To assess the facilitators and barriers of timely treatment in golden hours for patients with MI.
- To assess the outcome of timely treatment in golden hours among patients with MI.
- To find out the association between selected background variables and timely treatment in golden hours for patients with MI.
- To determine the association between the timely treatment and outcome of patients with MI.

## MATERIALS AND METHODS

This descriptive correlational study was carried out for four weeks in August 2020, among patients admitted due to MI in the cardiac intensive care unit of the selected tertiary care center in Chennai. The institutional ethical committee clearance and permission from the concerned authorities were obtained. An extensive review of the literature laid the foundation for the development of study instruments such as background variables pro forma, checklist to assess facilitators, barriers, and outcomes of timely treatment in golden hours for patients with MI. The content validity of the tools was obtained from the experts. The reliability was obtained by inter-rater observation method for the checklists to assess the facilitators ( $r = 0.75$ ), the barriers ( $r = 0.81$ ), and the outcome ( $r = 0.82$ ) of timely treatment in golden hours for MI patients. The pilot study was conducted to determine the feasibility and measurability of the tools. A total of 100 patients with MI after being shifted from the emergency ward or cardiac catheterization laboratory were selected by consecutive sampling technique. The study included individuals, who were at least 20 years old, had acute myocardial infarction (AMI) as determined by cardiac markers or an electrocardiogram (ECG), were completely cognizant and coherent (able to explain their symptoms), hemodynamically stable, and had not had chest pain for at least 48 hours. The patients with further severe physical or mental problems were excluded. The researcher briefly explained about the research to the selected patients and the consent was obtained from them and the data was collected two to five days after their admission. The data regarding background characteristics were collected and whether they received timely treatment or not were identified. Those who received timely treatment were interviewed by the facilitators and those who have not received timely treatment were assessed for the barriers using the predetermined tools and their outcomes were assessed. The collected data were analyzed using descriptive (frequency and percentage distribution) and inferential statistics (Chi-square).

## RESULTS AND DISCUSSION

The background variables distribution reveals that the majority of the patients were aged above 65 years (65%), males (79%), married (99%), living in urban areas (96%), and had no health insurance coverage (91%). About 32% had a higher secondary level of education, nearly half of them were retired (42%), sedentary workers (45%) with a monthly family income of above ₹50,000 (55%) and 34% of them received information regarding MI through mass media. The results project that gender played a significant role in the delay of treatment since females prolonged the decision-making process due to the presence of atypical symptoms compared with males.<sup>5</sup> There was a delay in seeking medical help among single/widowed/divorced patients rather than married patients. [Figure 1](#)



**Fig. 1:** Distribution of patients according to timely treatment in golden hours

projects that only 64% of the patients received and 36% of them did not receive timely treatment in golden hours.

The findings of this study revealed that the source of information and history of hypertension were significantly associated with timely treatment ( $p < 0.05$ ) among patients with MI. The reported facilitators seeking timely treatment in golden hours ([Table 1](#)) were the presence of bystander/family members when the symptom first appeared (88%) and family members' insistence (83%). The family members and mass media are crucial in seeking timely treatment. Since the symptoms occurred during day time (67%), the hospital was within 5 km, quickly recognized as cardiac-related symptoms (69%) they sought prompt medical attention (78%) and sought timely treatment. Considering that they understood the value of prompt treatment due to the perceived seriousness of their symptoms (56%) and preferred attending the emergency department (53%) overseeing a general physician, the majority of patients (61%) either had a supporting person accompany them or managed to get themselves to the hospital. The study concluded that recognition of signs and symptoms of AMI is a decisive factor for the seeking of a specialized service.<sup>5,6</sup> Perkins-Porras et al.<sup>7</sup> also reported that patients whose symptoms started in the presence of a bystander rather than being alone were more likely to have a short decision time ( $p = 0.006$ ). Patients who were away from home when their symptoms started had shorter decision times than those who were at home ( $p = 0.05$ ).

Regarding the barriers to receiving prompt medical attention ([Table 2](#)), these include failing to recognize the symptoms as cardiac related (78%), being unwilling to bother people (70%), perceiving the symptoms as being less severe (62%), and being alone themselves when they occurred (61%). More than half of them assumed their symptoms would subside (56%) were unaware that they posed a health risk (52%), concerned about the cost of therapy (42%), and took care of themselves (48%). About 30% of people claimed the hospital was far from where they lived, and 25% said they prioritized their jobs over going to the hospital. According to George et al.,<sup>8</sup> symptom progression and attempts at home on symptom treatment were found to be major determinants in patients' decision delays. Prior consultation at the study center, site of symptom onset, symptom interpretation, and method of conveyance were all substantially ( $p = 0.05$ ) correlated with

## Outcomes of Timely Treatment in Patients with Myocardial Infarction

**Table 1:** Frequency and percentage distribution of facilitators of timely treatment in golden hours of patients with MI (N = 100)

S. No.	Facilitators	Yes		No	
		f	%	f	%
1	I was with a bystander/with family members/with people at work	56	88	8	12
2	I was able to call emergency system immediately to get help for me	31	49	33	51
3	I managed it myself or had someone to transport me to the hospital	39	61	25	39
4	I recognized my symptoms are related to cardiac	44	69	20	31
5	I perceived seriousness of my symptoms	36	56	28	44
6	I was aware and I recognized the importance of early treatment as I was aware of MI	37	58	27	42
7	I preferred to visit emergency department rather than visiting a general physician	34	53	30	47
8	I was insisted by family members to seek care first	53	83	11	17
9	I was very anxious about my symptoms	30	47	34	53
10	The hospital was at a distance of >5 km away from my place	40	63	24	37
11	I was aware of the importance of going to hospital by ambulance when experiencing severe symptoms	39	61	25	39
12	As the pain was severe immediately I had to seek medical help	28	44	36	56
13	Symptoms occurred at daytime which promoted me to help early treatment	43	67	21	33
14	I did not want to waste time by waiting for the symptoms to disappear	50	78	14	22

**Table 2:** Frequency and percentage distribution of barriers of timely treatment in golden hours of patients with MI (N = 100)

S. No.	Barriers	Yes		No	
		f	%	f	%
1	I was alone when I first noticed my symptoms	22	61	14	39
2	When I experienced symptoms even though my family members were with me, I never told anyone as I thought he/she will become panic	19	52	17	48
3	When I experienced my symptoms, I pretended nothing was wrong	25	70	11	30
4	I did not take my symptoms as serious	22	62	14	38
5	There was lot of work to do so I thought I would go to hospital later	9	25	27	75
6	I was very concerned about the cost	15	42	21	58
7	Hospital was far away from the place where I experienced symptoms	11	30	25	70
8	I did not recognize that my symptoms were related to heart	28	78	8	22
9	I waited to see my symptoms would go away	28	78	8	22
10	My symptoms were not very severe to seek medical help immediately	19	52	17	48
11	I did not want to trouble any one	25	70	11	30
12	I did not know about MI and their symptoms	19	52	17	48
13	Symptoms persisted only for short period of time	20	56	16	44
14	I did not recognize my symptoms as a health threat	19	52	17	48
15	I believe that my symptoms are bearable and decided to seek medical help if the intensity increases	25	70	11	30
16	I knew something was happening, something that could be deadly so I took own medicines to get relief from my symptoms	17	48	19	52
17	Even though there were many hospitals nearby I travelled long distance to get my treatment in my preferred hospital	15	42	21	58

prehospital delays. Krishnan et al. reported that patients monthly family income and distance to health care facility increased the chance of delayed arrival to health care facility.<sup>9</sup> The outcome of patients with MI shows that their survival rate was high (98.44 and 86.11%), required only medical management (15.6 and 2.7%), percutaneous transluminal coronary angioplasty (PTCA) (81.25 and 52.78%), 3 days of hospitalization (93.75 and 30.55%), thrombolysis (4.69–5.55%), emergency coronary artery bypass graft (CABG) (1.56–38.9%) and intra-aortic balloon pump (IABP) support (3.12%–25%) among those who received timely treatment and delayed treatment respectively. There was incidence of complications such as cardiac arrest (1.56–30.55%), embolism (1.56–5.55%),

and dysrhythmias (4.69–50%) among those who received timely treatment and delayed treatment, respectively.

There was a significant association between timely treatment and source of information and history of hypertension ( $p < 0.05$ ), as in Table 3. The family members and mass media play important roles in seeking timely treatment. There was no significant association between the timely treatment and other background variables. Similarly, Farshidi et al.<sup>10</sup> mentioned that a high level of education ( $p = 0.0492$ ) and a family history of coronary artery disease ( $p = 0.01$ ) had a positive impact in causing less delay in arriving at the hospital. Patients claimed that self-medication (34.3%) and ignorance of CAD (38.8%) constituted the most frequently cited

**Table 3:** Association between selected demographic variables of patients with MI and timely treatment in golden hours (N = 100)

Variables	Timely treatment	Delayed treatment	$\chi^2$	p-value
Age (years)				
21–40	6	2	0.085	0.770
Above 41	58	34	df = 1	
Sex				
Male	50	29	0.082	0.774
Female	14	7	df = 1	
Marital status				
Married	63	36	NA	NA
Unmarried	1	1		
Education				
Up to high school	8	4	0.0133	0.908
Higher sec and Graduate	56	32	df = 1	
Occupation				
Employed	25	16	0.275	0.599
Unemployed	39	20	df = 1	
Type of work				
Moderate	53	28	0.3795	0.53
Heavy	11	8	df = 1	
Monthly income (₹)				
Up to 50,000	30	15	0.25	0.615
Above 50,000	34	21	df = 1	
Residence				
Rural	1	3	NA	NA
Urban	63	33		
Insurance				
Present	6	3	0.035	0.849
Absent	58	33	df = 1	
Source of information				
None	3	8	5.555	0.018
Family members/media	61	28	df = 1	
BMI				
Optimal	14	9	0.127	0.721
Overweight	50	27	df = 1	
Diabetes mellitus				
Yes	25	19	1.758	0.184
No	39	17	df = 1	
Hypertension				
Yes	11	14	5.787	0.0161
No	53	22	df = 1	
COPD				
Yes	2	2	NA	NA
No	62	34		
Smoking				
Yes	10	9	1.31	0.251
No	54	27	df = 1	
Alcohol				
Yes	8	10	3.643	0.056
No	56	26	df = 1	

(Contd...)

**Table 3:** (Contd...)

Variables	Timely treatment	Delayed treatment	$\chi^2$	p-value
Previous history of MI				
Yes	5	5	0.3906	0.5319
No	59	31	df = 1	
Previous history of CABG				
Yes	1	2	NA	NA
No	63	34		
Previous hospitalization				
Yes	11	10	1.557	0.212
No	53	26	df = 1	
Diet				
Vegetarian	5	4	0.0358	0.849
Non-vegetarian	59	32	df = 1	
Exercise				
Yes	44	21	1.098	0.294
No	20	5	df = 1	
Stress management				
Yes	22	20	2.337	0.126
No	34	16	df = 1	

BMI, body mass index; CABG, coronary artery bypass graft; COPD, chronic obstructive pulmonary disease; MI, myocardial infarction

causes for arrival delays. Direct hospital presentation was found to be independently predicted by smoking, the history of CAD, and the absence of diabetes.<sup>2</sup> These study findings illustrate that increasing awareness of patients about cardiovascular symptoms and their risk factors could be helpful in patient's decision in seeking medical help. So general education via media and primary and middle schools could be helpful.

The study findings revealed that timely treatment was significantly associated with the outcome of the patients such as survival, the requirement of CABG, PTCA, increased days of hospital stay, IABP, recurrence of cardiac arrest and dysrhythmia of patients with MI at  $p < 0.05$  (Table 4). It is evident from the study results that when compared to patients who received delayed care, those who received prompt care had a higher survival rate and needed fewer emergency CABGs, PTCAs, and longer hospital stays. Additionally, among individuals who received prompt treatment, the prevalence of sequelae such as cardiac arrest and dysrhythmias decreased. The prompt treatment did not significantly affect other outcomes, such as thrombolysis and embolism. Among patients with AMI, ignorance and symptom denial are important risk factors for prehospital delay. It is recommended that emergency cardiac care in the nation could be improved by raising public knowledge on the advantages of early presentation and by enhancing transportation options.<sup>11</sup>

## CONCLUSION

Nurses play a major role in providing education to people about timely treatment. Many people attempt to get relief from their symptoms by using symptom control management strategies such as taking their own medications, deep breathing exercises, etc. Current AHA guidelines suggest that not obtaining relief from the symptoms within a 5-minute window provides evidence that symptoms may be related to the heart and require immediate

**Table 4:** Association between timely treatment in golden hours and outcome of patients with MI (N = 100)

Outcomes	Timely treatment		Delayed treatment		$\chi^2$	p-value
	f	%	f	%		
<b>Patient condition</b>						
Survival	63	98	31	86	4.21	0.04
Death	1	2	5	14	df = 1	
<b>Management</b>						
Medical	10	16	1	3	2.68	0.101
No medical	54	84	35	97	df = 1	
<b>CABG</b>						
Emergency	1	2	14	39	22.33	0.000
Not emergency	63	98	22	61	df = 1	
<b>Thrombolysis</b>						
Done	3	5	2	5	0.03	0.848
Not done	61	95	34	95	df = 1	
<b>PTCA</b>						
Done	52	81	19	53	9.071	0.0025
Not done	12	19	17	47	df = 1	
<b>Hospital stay</b>						
Less than 3 days	60	94	11	31	41.67	0.000
More than 3 days	4	6	25	69	df = 1	
<b>IABP</b>						
Inserted	2	3	9	25	11.26	0.000
Not inserted	62	97	27	75	df = 1	
<b>Embolism</b>						
Present	1	2	2	5	NA	NA
Absent	63	98	34	95		
<b>Cardiac arrest</b>						
Occurred	1	2	11	31	18.34	0.000
Not occurred	63	98	25	69	df = 1	
<b>Dysrhythmia</b>						
Present	3		18		28.51	0.000
Absent	61		18		df = 1	

CABG, coronary artery bypass graft; IABP, intra-aortic balloon pump; PTCA, percutaneous transluminal coronary angioplasty; NA, not available

attention by a healthcare practitioner. These guidelines need to be more prominent in the general public's education about MI.

**Limitations**

There is a possibility of recall bias in this study since the patient had to recall their experience a few days before being interviewed. Furthermore, individuals with AMI who did not come to the hospital for treatment, died in the emergency ward/outside the hospital, and

who were cognizant of being interviewed during data collection were excluded. These patients might also have experienced barriers to seek timely medical care. Moreover, the study participants were not followed up for at least 30 days after their discharge to gather information on delayed outcomes.

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