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Factors Influencing Prehospital Delay in Seeking Medical Treatment among Patients with Myocardial Infarction

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Abstract

Introduction: Myocardial Infarction need prompt intervention within the first hour of symptom onset is crucial for reducing mortality rates. The likelihood of death or complications is heavily influenced by the speed at which treatment is administered after symptoms appear. Treatment delay is the duration between symptom onset and the point at which the patient achieves stability after receiving care. The current study investigates factors contributing to decision time for seeking medical help and home-to-hospital delay. Addressing these factors effectively can significantly improve patient prognosis.

Objectives: To assess the factors influencing prehospital delay in seeking medical treatment among myocardial infarctionpatients.

Methodology: A retrospective descriptive study was conducted with a sample size of 100 myocardial infarction patients admitted to M.S. Ramaiah Memorial Hospital, Bangalore. Non- probability convenient sampling techniques were used to select the samples. Data was collected using a self- administered questionnaire to assess the influencing prehospital delay in seeking medical treatment. Descriptive statistical analysis was performed to identify the major factors.

Results: A descriptive statistical analysis showed the majority (81%) of the subjects were male while the mean age was 60.13 with a standard deviation of ±13.577. Maximum subjects were found to have a chronic illness among them 42% have hypertension. The most common symptoms felt by the subjects were excessive sweating (53%) followed by chest pain (47%) and shoulder pain (42%). More than half (53%) of the subjects did not consider the symptoms seriously. A significant portion (37%) of the subjects experienced symptoms between 8 pm to 2 am. Maximum subjects were found to have a chronic illness among them 42% have hypertension. Even after the majority (58%) of the subjects were within 0 to 10 km away from the hospital, the maximum (44%) reached the hospital after 1 hour and within hours of symptom onset. The major (61%) reason for the delay was not taking symptoms seriously and waiting for them

to subside independently (68%). as well as misperceiving the cardiac symptoms with symptoms of Gastritis (43%) followed by 29% of the subjects went to the nearby clinic after symptoms onset.

Interpretation and conclusion: The study concluded that there were significant delays in seeking treatment due to emotional factors where many subjects didn't take symptoms seriously, social factors; most experiencing symptoms late at night, leading to a wait- and-see approach, and cognitive factors; misinterpreting symptoms as gastritis were common. However, there were no significant delays in transportation or treatment initiationby healthcare providers.

Keywords: Factors Influencing; Prehospital delay; Myocardial Infarction.

Introduction

As per World Health Organization (WHO) cardiovascular diseases (CVDs), are identified as the primary cause of global mortality, claiming approximately 17.9 million lives annually, primarily due to heart attacks and strokes (cardiovascular diseases, 2019). In India, the CVD mortality rate stands at 272 per 100,000, surpassing the global average of 235, highlighting its significant impact on premature deaths in both developed and developing countries (Sreeniwas K and Sinha, 2020). Coronary artery disease (CAD), the most prevalent CVD, affects about244.1 million people worldwide, with a notable male predominance (Cardiovascular Diseases, 2019). CVD- related deaths in India have increased from 2.26 million in 1990 to 4.77 million in 2020, with prevalence ranging from 1.6% to 7.4% in rural areas and 1% to 13.2% in urban areas (Huffman et al., 2011). More than 4.5 million deaths occur in developing countries. Myocardial Infarction (MI), a life- threatening coronary pathology and the most common form of CAD, is responsible for around 15% of global mortality annually. In 2022, India reported 32,457 deaths due to heart attacks, up from 28,413 in 2021 and initially decreasing from 28,579 in 2020 (Salari et al., 2023).

The elevated incidence in India is largely attributed to delays in seeking treatment, emphasizing the critical need for prompt medical attention. Prehospital delay occurs when patients take over an hour from symptom onset to reach the hospital. The first-hour post-heart attack, known as the golden hour, is crucial for reversing effects. Factors contributing to delays include difficulty recognizing symptoms, confusion between gastritis and heart attack, perceiving it as gastrointestinal or musculoskeletal pain, rather than a cardiac symptom, low socioeconomic status, hospital distance, transportation availability, and reliance on over-the-counter drugs. (Malhotra et al., 2003) According to De Luca and colleagues, each 30-minute delay in primary percutaneous coronary intervention increases 1-year mortality risk by 7.5%. Timely pharmacological or interventional reperfusion reduces mortality in myocardial infarction. Studies show delays result in higher mortality rates, with each hour of delay costing 2 lives per 1000 patients. Prompt thrombolytic treatment or angioplasty within optimal timeframes significantly reduces mortality compared to delayed interventions which address the critical need for prompt medical attention as early as possible. (Chowdhury et al., 2021)

Materials and Method

Research Design: A Retrospective Descriptive Study

Variables

Study variables: Factors leading to delay in institutional treatment among myocardial infarction patients.

Attribute variables: Personal characteristics/ data, which include, age, gender, marital status, educational

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status, occupation, income per month, religion, residence, and family history of heart problems.

Study Setting: The study was conducted in M.S Ramaiah Memorial Hospital, Bangalore.

Sample Size: 100 Myocardial infarction patients.

Sampling Technique: Non-probability convenient sampling technique.

Criteria for Sample Selection: The samples were selected with the following pre- determined criteria

Inclusion Criteria

Patients diagnosed and admitted with myocardial infarction in MS. Ramaiah Memorial Hospital, Bangalore. Patients who can read Kannada and English.

Exclusion Criteria

Patient admitted with myocardial infarction who reached hospital for treatment within golden hour (60 minutes) of symptom onset.

Patients who are not willing to participate.

Tool Development

After an extensive review of the literature, discussion with the experts, and the investigator's personal and professional experience the tool was developed and divided into two parts;

Section- A: The tool's first part comprises socio-demographic variables; age, gender, educational status, marital status, religion, occupation, monthly income, residence, presence of chronic disease, and family history of heart problems.

Section- B: This section consists of a self- administered questionnaire on factors causing prehospital delays in myocardial infarction. It covered five dimensions; emotional, social, and cognitive factors, traveling from home to the hospital, and initiation of hospital treatment.

Validity

The content validity of the tool was obtained from 9 experts, comprising of 2 Heads of the Department of Medical- Surgical Nursing, 2 professors of Medical-Surgical Nursing, 3 Assistant professors of Medical-Surgical Nursing, 1 cardiologist, and 1 physician from differentNursing colleges and hospitals, in Bangalore.

Reliability

The reliability score obtained for the English tool is 0.812 and the score for the Kannada tool is 0.760 which means both tools are reliable.

Ethical Clearance

Ethical clearance was objected from the Ramaiah Medical College Ethics Committee on July 2023 (Reg No: EC-23- 30-PG-RINER)

Pilot Study

The pilot study was conducted at Aster CMI Hospital, Bangalore. A total of 10 patients with Myocardial infarction were selected for the study. On completion of the pilot study, it was found that the study was feasible and practicable to conduct the main study.

Data Collection Procedure

Formal permission for data collection was obtained from the nursing superintendent of M.S. Ramaiah Memorial Hospital, Bangalore, and was carried out from 15/01/2024 to 20/04/2024 among 100 myocardial infarction patients in the cardiac care unit and general cardiac ward using non- probability-convenient-sampling-technique. Details aboutthe patients regarding their diagnosis were taken from the patient's file. The student researcher introduced herself, explained the study's purpose, and obtained verbal consent. A self-structured questionnaire was administered to assess factors influencing prehospital delay in seeking institutional treatment. A questionnaire, covering socio-demographicvariables and delay factors, was completed through interviews. Confidentiality was maintained. Each day about 1-4 patients were questioned. The

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average time taken to complete all the sections by the subjects was 20-25 minutes.

Statistical method

Statistical analysis for the study was done using IBM SPSS version 20. The results obtained are discussed in the following area.

Section A: Frequency and percentage distribution of socio-demographic variables.

Section B: Frequency and percentage distribution of factors causing delay in seeking medical treatment.

Result

Section A

Table 1: Frequency and percentage distributions of subjects regarding socio-demographics variables: n=100

Sn.	Socio-Demographic Variables	Frequency (f)	Percentage (%)
1.	Age in years		
	20-30years	2	2
	31-40years	7	7
	41-50years	16	16
	51-60years	25	25
	61-70years	30	30
	71-80years	11	11
	81-90years	9	9
2.	Gender		
	Male	81	81
	Female	19	19
	Widower/widow	17	17
	Separated/divorced	1	1
3.	Educational status		
	No formal education	4	4
	Primary	11	11
	Higher Secondary	33	33
	PUC	17	17
	Graduation and above	35	35
4.	Marital Status		
	Unmarried	2	2
	Married	80	80
	Widower/widow	17	17
	Separated/divorced	1	1
5.	Religion		
	Hindu	83	83

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	Christian	9	9
	Muslim	8	8
6.	Occupation		
	Government employee	14	14
	Private employee	25	25
	Own business	17	17
	House maker	20	20
	Coolie	1	1
	Unemployed	23	23
7.	Income per month		
	Less than 25000	34	34
	26000 to 50000	40	40
	50000 and above	26	26
8.	Residence		
	Rural	20	20
	Urban	80	80
9.	Presence of chronic disease		
	No	39	39
	Yes	61	61
	If yes (specify) Hypertension	42	69
	Diabetics	40	65
	Cerebrovascular accident	4	6
	Chronic kidney disease	4	6
	COPD	3	5
	Cervical cancer	1	2
10.	History of heart problem in a first-degree relative		
	Yes	39	39
	No	61	61

Table 1: Depicts that, the majority of subjects, (30%) were between 61-70 years, with a mean age of 60.13 (SD ± 13.577). Most (81%) were male. Education levels varied highest (35%) graduated, and the maximum (80%) were married, over four-fifths (83%) were Hindu. Regarding occupation, majority (25%) worked in the private sector. Most (40%) had an income of 26000 to 50000 per month, and (80%) resided in urban areas. A substantial majority (61%), predominantly hypertension (69%), and most subjects (61%) had no history of heart problems in their first-degree relative.

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Section B:

Table 2: Frequency and percentage distribution of subjects regarding factors causing delay in seeking institutional treatment. n=100

Sn.	Factors Causing Delay	Frequency(F)	Percentage (%)
1	Felt symptoms		
	Chest pain	47	47
	Chest tightness	25	25
	Shoulder pain	42	42
	Upper back pain	35	35
	Excessive sweating	53	53
	Fatigue	39	39
	Jaw pain or discomfort	17	17
	Dizziness	30	30
	Nausea	4	4
	Vomiting	12	12
	Stomach upset	4	4
	Breathing difficulty	12	12
	Syncope	3	3
	Chest burning	4	4
2	Considered the symptoms seriously		
	Yes	47	47
	No	53	53
3	Feel afraid of symptoms		
	Yes	41	41
	No	59	59
4	Feel embarrassed to ask for help, when symptoms began		
	Yes	12	12
	No	88	88
5.	Felt symptoms like this before		
	Yes	59	59
	No	41	41
6	Symptoms begin between		
	8 am to 2 pm	26	26
	8 pm to 2 am	37	37

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	2 pm to 8 pm	17	17
	2 am to 8 am	20	20
7	Were you alone when the symptoms began?		
	Yes	25	25
	No	75	5
8.	The first person contacted when symptoms started.		
	Family member	85	85
	Friends	8	8
	Physician	7	7
9	Waited for symptoms to subside		
	Yes	68	68
	No	32	32
10	Knowing about the heart problem		
	Yes	36	36
	No	64	64
11	Symptoms felt like		
	Gastritis/Acidity	43	43
	Chest problem	36	36
	Musculoskeletal problem	9	9
	Because of tiredness	7	7
	Unpredictable	5	5
12	Triggering factor of the symptoms		
	Could not identify the triggering Factor	64	64
	Physical stress	35	35
	Emotional stress	1	1
13	Take medicine on your own to manage the symptoms		
	No	79	79
	Yes	21	21
	If yes, specify Paracetamol	8	38
	Gelusil	5	24
	Eno	4	19
	Ecosprin	3	14

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	Prolomet XL	1	5
14	Mode of transportation		
	Ambulance	17	17
	Rented vehicle	45	45
	Own vehicle	38	38
15	Came hospital on your own		
	Yes	16	16
	No	84	84
16	Approach vehicles		
	Within 1 to 6 hours	50	50
	Within 6 to 12 hours	16	16
	Within 12 to 18 hours	8	8
	Within 18 to 24 hours	15	15
	After 24 hours	11	11
17	Distance between the place of symptoms onset to the hospital		
	0 to 10 km	58	58
	11 to 20 km	24	24
	21 to 30 km	5	5
	More than 40 km	13	13
18	Time taken to reach hospital after symptom onset		
	Within 1 to 6 hours	44	44
	Within 6 to 12 hours	20	20
	Within 12 to 18 hours	10	10
	Within 18 to 24 hours	17	17
	After 24 hours	9	9
19	Delay due		
	Not taking symptoms seriously	61	61
	Went to the nearby clinic	29	29
	Far distance from the hospital	10	10
20	Time taken to stabilize		
	Less than 30 minutes	72	72
	30 minutes to 1 hour	17	17
	More than 1 hour	11	11
21	Delay in treatment in hospital		

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	No	89	89
	Yes	11	11
	If yes, specify the reason Investigation's process	8	73

Table 2: Depicted that the majority (53%) of the subjects had symptoms of excessive sweating followed by chest pain (47%). More than half (53%) did not consider the symptoms seriously, a maximum (59%) did not feel afraid of the symptoms while the majority (88%) were not embarrassed to seek help. Over half (59%) had previously experienced similar symptoms. Notably, (37%) of the subjects experienced symptoms between 8 pm to 2 am. The vast majority (75%) were not alone when the symptoms began, and (85%) contacted their family first. A substantial number (68%) decided to wait for symptoms to subside without taking them seriously. The majority (64%) were unaware of heart problems, and (43%) mistook symptoms for gastritis/Acidity. Additionally, more than half (64%), of the subjects could not identify the triggering factor. Vast majority (79%) avoid self- medicating, with (8%) using paracetamol tablets to relieve pain. Nearly half (45%) reached the hospital by rented vehicle, with a maximum (84%) arriving accompanied by someone. The majority (50%) approached vehicles within 1 to 6 hours of symptoms onset. Over half (58%) were within 0-10 km from the hospital. The largest group (44%) of the subjects reached the hospital within 1 to 6 hours, and more than half (61%) of the delays were due to not taking the symptoms seriously. Most (72%) subjects took between 30 minutes to 1 hour to stabilize their condition. Additionally, a majority of the subjects (89%) reported no delays in receiving treatment upon arrival at the hospital.

Discussion

The findings have been discussed according to the objective:

Socio demographic variables

Previous similar studies including one by Ishmum Zia Chowdhury et al. in Dhaka, Bangladesh (2021) also found Myocardial Infarction more prevalent among males, as reflected in the current study where 81% of subjects were male. Both studies similarly observed high rates of diabetes and hypertension among subjects. Like other research, the majority of the study population was aged 40 and above, with cases decreasing after age 70.The objective is to assess factors influencing prehospital delay in seeking institutional treatment.

A cross-sectional study by Madheeh Mohamed Hussain et al. in Maldives (2023), found that (60.6%) arrived within 6 hours, aligning with our study where nearly half (44%) of subjects arrived within 1 hour to 6hours of symptoms onset. Similarly, a study conducted in Iran reported that the majority (43.2%) of the subjects within 1-6 hours of symptoms onset.

A cross-sectional study by Syed F Mujtaba et al conducted in a Rural satellite Center in Larkana, Pakistan (2021), which is similar to our study showed that a maximum number of the subjects were delayed due to time taken for decision-making where one-third of the subjects misperceived symptoms among them 50% predicted the symptoms of gastritis. Comparably our study 61% of the subjects extended the time by not considering the symptoms seriously and 43% of the subjects misperceived cardiac symptoms as gastritis.

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The information achieved in this study regarding the factors influencing prehospital delay in seeking medical treatment among myocardial infarction patients can be utilized by health personnel to conduct awareness program that helps educate the public regarding recognizing cardiac symptoms and the importance of seeking medical treatment quickly. Educating patients about recognizing symptoms as soon as possible will help them to seek medical attention earlier. General education campaigns through media channels like radio, television, and newspapers, as well as integrating cardiovascular education into primary and middle school curriculums will help reduce the delay time.

Limitations

- Our study has focused on the private healthcare system and leaving out patients who were in public healthcare.
- The study maximum holds the urban population where the rural populations are lacking in the study.
- The study was limited to samples from only one hospital.

Conclusion

The following conclusions were drawn based on the findings of the study;

This study identifies key reasons for delay in treatment due to emotional, social, and cognitive factors. Emotional factors reveal that over half of the subjects did not consider the symptoms seriously. Social factors indicate that a maximum begun the symptoms between 8 pm to 2 am, leading many to wait for symptoms to subside. Cognitive factors indicate that most subjects were unaware of heart problems with nearly half misinterpreting the cardiac symptoms as gastritis. The primary delay was not taking symptoms seriously. There is no significant delay in transportation or initiation of treatment by the healthcare provider.

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