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RESEARCH ARTICLE

THE ROLE OF PRIMARY HEALTH CARE IN THE TIMELY TREATMENT AND HOSPITALIZATION OF PATIENTS WITH ACUTE MYOCARDIAL INFARCTION: EVIDENCE FROM GEORGIA

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ABSTRACT

INTRODUCTION:

Family physicians play a critical role in managing and urgently referring patients with myocardial infarction. This study aims to examine the role of primary healthcare system related to timely treatment and, when necessary, hospitalization of patients with acute myocardial infarction.

METHODOLOGY:

As part of this quantitative research, a survey was conducted with patients with acute myocardial infarction.

RESULTS:

Patients primarily contact emergency medical services directly, bypassing their family doctor. Only 11% of patients consulted a family doctor during their illness, indicating that primary healthcare in Georgia is not sufficiently developed. Among patients who directly sought emergency services at symptom onset, 95.8% received emergency care within two hours. However, patients who consulted their family physician before hospitalization experienced shorter delays, allowing for quicker referral to emergency services compared to those who attempted self-treatment. Family doctors are more likely to recognize symptoms accurately and refer patients promptly when needed. In contrast, self-treatment—prevalent in our study (n=98, 22.5%)—is associated with longer delays (n=90, 66.7%) in accessing emergency care.

CONCLUSION:

Public health campaigns are recommended to encourage patients with chest pain to seek immediate emergency medical assistance. For minor discomfort, consulting a family doctor is more appropriate.

KEYWORDS

family doctor, acute myocardial infarction, primary health care

INTRODUCTION

According to the statistical data from 2020 [1], in terms of registered and new cases of diseases, circulatory system diseases take the first place in Georgia. The share of circulatory system diseases is 17.6% of all diseases registered in the country, and 10.2% of new cases. From 2000 to 2020, there was a trend of increasing prevalence of circulatory diseases and new cases in Georgia. Researchers attribute this increase to the rise in the number of beneficiaries using

the program as a result of the introduction of the universal healthcare program in 2013. Hypertensive diseases (58.4%), ischemic heart diseases (15.3%), and cerebrovascular diseases (3.1%) are characterized by high morbidity and mortality within this group of diseases.

Timely medical care is vitally important during myocardial infarction. Many patients do not realize the importance of the symptoms of the disease and do not consult a doctor in time, resulting in the loss of precious time required for treatment. According to studies [2], only 10-15% of patients turn to emergency medical services within the first three hours after the initial symptoms of myocardial infarction develop. Within the first six hours, 20-25% seek help, and after 12-24 hours, 75-80% do so.

Studies indicate that the majority of patients die before receiving proper medical care, within the first hours of symptom onset [3]. Experts assert that the faster and more timely the diagnosis and treatment of ST-segment elevation myocardial infarction (STEMI) patients, the greater the potential to reduce mortality, improve outcomes, and shorten hospital stays [4]. In 2017, the European Society of Cardiology adopted a guideline for STEMI, establishing the "zero time" or cut-off time immediately after the diagnosis of STEMI, following an ECG [5].

It is essential to start reperfusion therapy as soon as possible, ideally no later than 90 minutes after the first medical contact [6]. However, the most crucial factor in achieving the best possible outcome for the patient is the total ischemia time, i.e., the time between symptom onset and reperfusion therapy. Thus, patient decision-making time is critical, but delays in treating symptoms of myocardial infarction remain a problem, as prehospital delay times are consistently high [7].

To develop effective interventions encouraging timely patient action, it is vital to study and understand how patients with myocardial infarction are diagnosed and treated. In many countries, patients have access to medical advice via telephone, internet, or self-care guidelines. However, it is not known to what extent individuals benefit from their family doctor's medical advice over the phone instead of immediately contacting an ambulance, and how such decisions affect diagnosis time during myocardial infarction.

Approximately 1-3% of patients experience chest pain [8]. In 10-18% of cases, chest pain is caused by ischemic heart disease, with 2-4% resulting from myocardial infarction or unstable angina, requiring emergency care. Family physicians, as primary care providers, play a key role in the early detection and treatment of acute myocardial infarction and are often the first contact for patients [9].

In Georgia, the primary health care system is not as developed as in many other countries. Consequently, continuous supervision by family doctors for patients with myocardial infarction is inadequate [10]. Patient awareness of myocardial infarction symptoms, self-care measures, and the importance of timely emergency calls is low, leading to delayed hospitalization [11].

The time elapsed between the onset of symptoms and appropriate medical care is a critical factor in determining the clinical course of patients with myocardial infarction. Decision-making time is the most significant component of patient delay in the prehospital phase. Many cases of sudden cardiac death occur before the patient is hospitalized [12]. Therefore, continuous supervision by family doctors, proper awareness, and a quick response to symptoms of acute cardiac ischemia are of great importance.

According to existing clinical guidelines for the prevention of cardiovascular diseases, family physicians should evaluate the risk factors and clinical consequences associated with chest pain and decide whether the patient should be transferred to the hospital [13]. This underscores the importance of the primary health care system in the management of patients with chronic cardiovascular diseases [14, 15, 16], particularly in Georgia, where the primary health care system is underdeveloped. Family doctors play a key role in coordinating disease treatment [17]. They are responsible for carrying out preventive measures and, if necessary, referring patients to medical specialists or hospital services, as well as conducting follow-up and monitoring of hospital treatment [18]. Adequate access to primary health care services and continuous follow-up by family physicians is a critical factor in preventing deterioration of the patient's health [19[i]].

To date, many studies have examined the reasons for delayed hospitalization in patients with symptoms of myocardial infarction [20]. However, the role of primary care in delayed hospitalization for acute myocardial infarction in Georgia has not been thoroughly investigated. The relevance and scientific novelty of this research are determined by the fact that, for the first time, a

comprehensive study was conducted in Georgia on the timeliness of treatment, the scope and nature of self-help for patients with myocardial infarction at the prehospital stage, their awareness, and the reasons for late referral to emergency medical services.

The research aims to comprehensively study the challenges of the primary health care system in Georgia regarding the timeliness of treatment for patients with acute myocardial infarction in the prehospital stage and, if necessary, hospitalization.

METHODOLOGY

STUDY DESIGN AND PARTICIPANTS

A quantitative, cross-sectional research design was conducted. Three large hospitals of three big cities in Georgia (Tbilisi, Kutaisi, and Batumi) were selected for the study. The selection criteria of hospitals were more than 100 bed fund and high bed occupancy. The target group of the study was represented by the patients with acute myocardial infarction from selected cardiology clinics. Inclusion criteria for the study included patients aged 18 years or older. Patients with unrelated medical conditions are frequently excluded. A total of 436 patients with acute myocardial infarction were included in the study.

RESEARCH TOOLS

An adapted version of the questionnaire was used as a research tool. The questionnaire was developed based on various research and experts' opinions [21]. Prior to the start of the study, the questionnaire was pre-piloted. Adaptations were made considering the socio-cultural context, language, specific research interests, target respondents, and needs identified during piloting. Respondents were interviewed during physical meetings at the clinic. The average duration of filling out the questionnaire was about 15 minutes. Data collection was carried out over a five-week period from February 5 to June 30, 2024.

ETHICAL ISSUES

Before starting the study, approval was obtained from the Research and Ethics Committee of the Caucasus University. The survey was conducted following the principle of informed consent. Before participating in the study, the meaning and purpose of the study were explained to the respondents, after which verbal consent was obtained from them regarding their willingness to participate in the study.

Respondents were given an explanation that they would not be harmed for participating in the study. They were informed that they could refuse to participate in the study at any stage of the interview. The anonymity and confidentiality of the participants was protected in the study. Names and surnames of the participants were not indicated anywhere.

LIMITATIONS OF THE STUDY

Limitations of the study include its focus on a limited geographical area and the inclusion of only patients with myocardial infarction. Future studies would benefit from including patients with other conditions. Additionally, conducting an analysis from the providers' perspective would offer further insights and provide more comprehensive evidence.

RESULTS

A total of 436 patients with acute myocardial infarction were included in the study, of whom 77.5% (n=338) were men, and 65.8% (n=287) lived in urban areas. Most of the interviewed patients (n=195, 44.7%) denied tobacco dependence, and 31.2% (n=136) reported alcohol use. The average age of the patients was 62 years (range 34-91), with the largest age group being 65-79 years old (n=189; 43.3%).

Of the hospitalized patients, 82.1% (n=358) experienced symptoms while at home. The majority developed symptoms on weekdays (n=348, 79.8%), during the evening or night, between 18:00 and 6:00 (n=265, 60.8%), and were not alone (n=305, 70%). Additionally, 61.7% of patients (n=269) had previously experienced similar symptoms (Table 1).

Timely hospitalization of patients depends on various complex factors, including the distance to the nearest medical facility. At the onset of symptoms, 78.2% of patients (n=341) reported that the nearest medical facility was less than 50 km away. Patients' medical histories indicated arterial hypertension (58%, n=251), previous myocardial infarction (n=83, 19%), angina pectoris (n=74, 17%), diabetes (n=78, 18%), atrial fibrillation (n=22, 5%), and chronic heart failure (n=17, 4%). The majority of patients (n=318; 73%) were subsequently diagnosed with ST-elevation myocardial infarction (STEMI) (Table 1).

At the initial stage, only 48 patients (11%) contacted a family doctor. Instead, 47% of patients (n=205) contacted

emergency medical services directly, 22.5% (n=98) self-medicated, and 19.5% (n=85) called a cardiologist.

When family doctors were involved, 43.8% (n=21) of patients directly contacted emergency medical services via mobile phone; 31.3% (n=15) of family physicians visited the patient during the day and then referred the patient to the emergency medical service; and 12% of family doctors (n=25) visited the patient immediately and called the emergency service (Table 1).

Female patients (n=35, 72.9%) with higher education (n=31, 64.6%), those living in rural areas (n=37, 77.1%), non-smokers (n=31, 64.6%), and alcohol users (n=27, 56.3%) were more likely to consult a family doctor before hospitalization. Additionally, these patients typically did not live alone (n=37, 77.1%), were not alone at the onset of symptoms (n=35, 72.9%), became ill on weekdays (n=41, 85.4%), and developed symptoms during the evening/night (n=27, 56.3%). Moreover, patients with a history of similar symptoms (n=32, 66.7%) and those diagnosed with ongoing non-ST-elevation myocardial infarction (NSTEMI) (n=32, 66.7%) were more likely to consult a family doctor. Hypertension was also more common among patients who consulted a family doctor (n=28, 58.3%) (Table 1).

TABLE 1 CHARACTERISTICS OF PATIENTS WHO CONTACTED OR DID NOT CONTACT A FAMILY DOCTOR BEFORE HOSPITALIZATION WHEN PRESENTING SYMPTOMS OF ACUTE MYOCARDIAL INFARCTION

	Sum N = 436	Consult a family doctor n=48 (11%)	Other n=388
Age			
< 50	34 (7.8)	4 (8.3)	30 (7.7)
50-64	126 (28.9)	15 (31.3)	111 (28.6)
65-79	189 (43.3)	21 (43.8)	168 (43.3)
80 >	87 (20)	8 (16.7)	79 (20.4)
Gender			
Female	98 (22.5)	35 (72.9)	63 (16.2)
Male	338 (77.5)	13 (27.1)	325 (83.8)
Education			
Average	258 (59.2)	17 (35.4)	241 (62.1)
Higher	178 (40.8)	31 (64.6)	147 (37.9)
Dwelling place			
City	287 (65.8)	11 (22.9)	276 (63.3)
Village	149 (34.2)	37 (77.1)	112 (27.7)
Tobacco consumption			
Yes	154 (35.3)	14 (29.2)	140 (36.1)
No	195 (44.7)	31 (64.6)	164 (42.3)
Rarely	87 (20)	3 (6.3)	84 (21.6)
Alcohol consumption			
Yes	136 (31.2)	13 (27.1)	123 (31.7)
No	123 (28.2)	27 (56.3)	96 (24.7)
Rarely	177 (40.6)	8 (16.7)	169 (43.6)
Live alone			
Yes	95 (21.8)	11 (22.9)	84 (21.6)
No	341 (78.2)	37 (77.1)	304 (78.4)
I got sick at home			
Yes	358 (82.1)	10 (20.8)	348 (89.7)
No	78 (17.9)	38 (79.2)	40 (10.3)

I was alone when the symptoms started			
Yes	131 (30)	13 (27.1)	118 (30.4)
No	305 (70)	35 (72.9)	270 (69.6)
I got sick over the weekend			
Yes	88 (20.2)	7 (14.6)	81 (20.9)
No	348 (79.8)	41 (85.4)	307 (79.1)
My symptoms started in the evening/night between 18:00 and 6:00			
Yes	265 (60.8)	27 (56.3)	238 (61.3)
No	171 (39.2)	21 (43.8)	150 (38.7)
Distance to hospital			
≥ 50 km	95 (21.8)	8 (16.7)	87 (22.4)
≤ 50 km	341 (78.2)	40 (83.3)	301 (77.6)
Presence of similar symptoms in the past			
Yes	269 (61.7)	32 (66.7)	237 61.1
No	167 (38.3)	16 (33.3)	151 38.9
Presence of concomitant diseases in the past			
Angina	74 (17)	9 (18.8)	65 (16.8)
Hypertension	251 (58)	28 (58.3)	223 (57.5)
diabetes	78 (18)	8 (16.7)	70 (18.0)
pulsatile arrhythmia	22 (5)	3 (6.3)	19 (4.9)
heart failure	17 (4)	1 (2.1)	16 (4.1)
Myocardial infarction	83 (19)	7 (14.6)	76 (19.6)
diagnosis			
ST-elevation myocardial infarction (STEMI)	318 (73)	16 (33.3)	302 (77.8)
Non-ST-elevation myocardial infarction (NSTEMI)	118 (27)	32 (66.7)	86 (22.2)
Actions taken by the patient at the onset of symptoms			
Contact your family doctor	48 (11)	13 (27.1)	35 (9.0)
Contact emergency medical services directly	205 (47)	17 (35.4)	188 (48.5)
Self help	98 (22.5)	10 (20.8)	88 (22.7)
The cardiologist was called	85 (19.5)	8 (16.7)	77 (19.8)
Action of the family doctor after calling the patient			
Direct patient referral to emergency medical service via mobile	21 (43.8)	7 (35)	14 (50)
Visit the patient immediately and call emergency services	12 (25)	5 (25)	7 (25)
Visiting the patient during the day and then referring to the emergency medical service	15 (31.3)	8 (40)	7 (25)

The average delay time from the onset of symptoms to the decision to receive medical care was 0:45 hours in patients who contacted their family doctor before hospitalization and 2:40 hours in other patients ($p<0.01$). Additionally, 9% of patients contacted their family doctor before hospitalization and 22% of other patients delayed more than 6 hours before deciding to seek medical care.

The length of time from the onset of an angina attack to seeking medical care is influenced by various factors. The majority of patients who had higher education (n=79, 54.9%), were urban residents (n=100, 69.4%), used tobacco (n=76, 52.8%), and did not use alcohol (n=74, 51.4%). Furthermore, those who did not live alone (n=123, 85.4%) and were not alone when symptoms developed (n=126, 87.5%) were more likely to become ill on working days (n=131, 91%) (Table 2).

TABLE 2 FACTORS RELATED TO THE LENGTH OF TIME TO SEEK MEDICAL CARE FROM THE ONSET OF AN ANGINA ATTACK.

	Sum N = 436	≤ 2 hr, n=144, 33%	2-6 hr, n=157, 36%	>6, n=135, 31%
Age				
< 50	34 (7.8)	6 (4.2)	12 (7.6)	16 (11.9)
50-64	126 (28.9)	26 (18.1)	42 (26.8)	58 (43)
65-79	189 (43.3)	75 (52.1)	73 (46.5)	41 (30.4)
80 >	87 (20)	37 (25.7)	30 (19.1)	20 (14.8)
Gender				
Female	98 (22.5)	39 (27.1)	31 (19.7)	28 (20.7)
Male	338 (77.5)	105 (72.9)	126 (80.3)	107 (79.3)
Education				
Average	258 (59.2)	65 (45.1)	95 (60.5)	98 (72.6)
Higher	178 (40.8)	79 (54.9)	62 (39.5)	37 (27.4)
Dwelling place				
City	287 (65.8)	100 (69.4)	102 (65)	85 (63)
Village	149 (34.2)	44 (30.6)	55 (35)	50 (37)
Tobacco consumption				
Yes	154 (35.3)	26 (18.1)	61 (38.9)	67 (49.6)
No	195 (44.7)	76 (52.8)	71 (45.2)	48 (35.6)
Rarely	87 (20)	42 (29.2)	25 (15.9)	20 (14.8)
Alcohol consumption				
Yes	136 (31.2)	25 (17.4)	47 (29.9)	64 (47.4)
No	123 (28.2)	74 (51.4)	24 (15.3)	25 (18.5)
Rarely	177 (40.6)	45 (31.3)	86 (54.8)	46 (34.1)
Live alone				
Yes	95 (21.8)	21 (14.6)	41 (26.1)	
No	341 (78.2)	123 (85.4)	116 (73.9)	33 (24.4)
				102 (75.6)
I was alone when the symptoms started				
Yes	131 (30)	18 (12.5)	55 (38.2)	58 (40.3)
No	305 (70)	126 (87.5)	102 (70.8)	77 (53.5)
I got sick over the weekend				
Yes				45 (31.3)
No	88 (20.2)	13 (9)	30 (20.8)	90 (62.5)
	348 (79.8)	131 (91)	127 (88.2)	

My symptoms started in the evening/night between 18:00 and 6:00				
Yes	265 (60.8)	86 (59.7)	97 (67.4)	82 (56.9)
No	171 (39.2)	58 (40.3)	60 (41.7)	53 (36.8)
Actions taken by the patient at the onset of symptoms				
Contact your family doctor	48 (11)	6 (4.2)	42 (26.8)	0
Contact emergency medical services directly	205 (47)	138 (95.8)	67 (42.7)	0
Self-help	98 (22.5)	0	8 (5.1)	90 (66.7)
The cardiologist was called	85 (19.5)	0	40 (25.5)	45 (33.3)

56% of patients (n=244) reported that they sought medical care late. The main reasons for the delay in seeking medical help during illness were as follows: did not consider themselves sick enough to seek medical help (n=112, 45.9%), considered self-help as a faster and easier way (n=74, 30.3%), did not have time to go to the doctor (n=34, 13.9%), did not want to bother the doctor (n=24, 9.8%). These factors were more pronounced in patients who were more than 6 hours late (Table 3).

TABLE 3: REASONS FOR DELAY IN SEEKING MEDICAL CARE DURING ILLNESS

	Sum N = 244, 56%	≤ 2 hrs. n=33, 13.5%	2-6 hrs. n=90, 36.9%	>6,n=121, 49.6%
Did not consider myself sick enough to seek medical help	112 (45.9)	16 (48.5)	42 (46.7)	54 (44.6)
I thought that self-help is a faster and easier way	74 (30.3)	8 (24.2)	28 (31.1)	38 (31.4)
I didn't have time to go to the doctor	34 (13.9)	5 (15.2)	12 (13.3)	17 (14.0)
I didn't want to bother the doctor	24 (9.8)	4 (12.1)	8 (8.9)	12 (9.9)

DISCUSSION

The study confirmed that the majority of patients had serious cardiovascular diseases, particularly ST-elevation myocardial infarction (STEMI) (n=318, 73%). Socio-demographic factors such as gender, education, and place of residence influenced patients' behavior in contacting their family doctor before hospitalization. Factors like education level, tobacco and alcohol use, time of symptom onset (during work or leisure time, evening/night hours), and being alone also affected the time from the onset of an angina attack to seeking medical care.

The study revealed that only 11% of patients consulted a family doctor when experiencing symptoms of acute myocardial infarction, with these patients being diagnosed with non-ST-elevation myocardial infarction (NSTEMI). The primary action of patients experiencing chest pain was to directly contact emergency medical services (47%), followed by self-help (22.5%) and calling a cardiologist (19.5%). This trend may be influenced by the fact that emergency medical care in Georgia is entirely free for patients.

The low referral rate to family doctors during illness suggests that primary health care in Georgia is not adequately developed [22, 23]. The lack of development of the primary health care system in Georgia is indicated by the fact that the number of referrals to outpatient medical facilities is 3.5 per patient (in European countries it reaches 7.5 per patient) [24]. Patients refer to medical specialists without the advice of a family doctor and engage in self-medication [25, 26]. This deficiency is evident in the low level of trust in family doctors and the limited use of primary healthcare services compared to European standards [27].

Thus, the patient's consultation with the family doctor is not the main way to receive medical care. Many patients do not consider that they should first consult their family doctor in case of illness. Studies show that referral to a family doctor increases delays in emergency medical services [28, 29, 30]. According to our study, 95.8% of patients who went directly to emergency medical services at the onset of symptoms took less than 2 hours to receive emergency medical services.

However, patients who consulted their family physician before hospitalization had shorter delay times and were able to access emergency medical services earlier, up to 6 hours earlier than patients who self-medicated. This is because family doctors properly perceive the symptoms and try to refer patients to the emergency medical service in time if necessary. In contrast to this, during self-treatment, which also has a large share in our study (n=98, 22.5), the delay time for emergency medical assistance is relatively high (n=90, 66.7).

In 31% of cases, the time to seek emergency medical care exceeded 6 hours. This delay can be attributed to the complex decision-making process following the onset of chest pain, which involves cognitive, emotional, and contextual factors [31].

It is essential to improve patient education on treatment plans, rehabilitation, and post-hospital care [32]. In this regard, understanding the symptoms of cardiovascular disease and the risks associated with delaying treatment is important, as it can reduce the likelihood of developing complicated forms of acute myocardial infarction [33]. Additionally, family doctors should inform patients about maintaining a healthy lifestyle, particularly by discouraging tobacco use, promoting healthy eating, and encouraging physical activity. The role of primary care staff is crucial in facilitating such educational efforts.

CONCLUSION

The family physician plays a significant role in managing patients with angina pectoris and facilitating referral to emergency medical care. However, many patients directly contact emergency medical services without consulting their family doctor. Public health campaigns are recommended to encourage patients with chest pain to immediately contact emergency medical services. If the discomfort is minor, it is more appropriate to consult a family doctor.

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