Evaluation of acute myocardial infarction management guidelines` indicators (Stent save a life, code 247) in patients referred to cardiology Department of Valiasr Hospital in Fasa, Southwest of Iran 2019

Evaluación de los indicadores de las pautas para el manejo del infarto agudo de miocardio (Stent save a life, código 247) en pacientes remitidos al Departamento de Cardiología del Hospital Valiasr en Fasa, suroeste de Irán 2019

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Abstract

Introduction: Acute myocardial infarction is one of the most common and major health problems in most societies. Implementation of acute myocardial infarction management guidelines will play a key role in preventing high-risk complications and improving treatment outcomes. The purpose of this study was to evaluate the indicators of acute myocardial infarction management guidelines` indicators (Stent save a life, code 247) in patients referred to the cardiac ward of Vali Asr Hospital in southwest Iran in 2019.

Methods: This study was a cross-sectional study in which the indicators of acute myocardial infarction management guidelines (code 247) were studied for 15 months from April 2018 until the end of June 2019. Sampling was done by census. Accordingly, 153 patients were studied. A checklist consisting of demographic data and information related to the implementation of the MI management guidelines was used to collect the data. Data were analyzed by SPSS, version 23, software and descriptive statistics.

Results: 77.1% (118) of patients were male and 22.9% (35) were female. Mean and standard deviation of age of patients were 60.58 ± 12.43. Regarding the timing indices for receiving services, the results of the study showed that the Door to Code TIME (time duration of patient admission to the hospital to activation of the code 247) was 12.36 ± 6.25 in this study, which should be less than 10 minutes. Also, the duration of the Door to Device Time (time duration between arrival of the patient with acute myocardial infarction to performing the angioplasty) was 180 minutes in the present study, which should be less than 90 minutes.

Conclusion: The guidelines for the management of myocardial infarction (247) were not ideal in some of the indicators in the studied unite that the effective barriers and challenges needed to be studied and improved. It is also recommended that these protocols be continuously evaluated to provide better efficacy.

Keywords: Myocardial infarction, Guidelines, Evaluation, Angioplasty.

Resumen

Introducción: el infarto agudo de miocardio es uno de los problemas de salud más comunes y graves en la mayoría de las sociedades. La implementación de pautas para el manejo del infarto agudo de miocardio jugará un papel clave en la prevención de complicaciones de alto riesgo y la mejora de los resultados del tratamiento. El propósito de este estudio fue evaluar los indicadores de los indicadores de las pautas para el manejo del infarto agudo de miocardio (Stent save a life, código 247) en pacientes remitidos a la sala cardíaca del Hospital Vali Asr en el suroeste de Irán en 2019.

Métodos: Este estudio fue un estudio transversal en el que se estudiaron los indicadores de las pautas para el manejo del infarto agudo de miocardio (código 247) durante 15 meses desde abril de 2018 hasta finales de junio de 2019. El muestreo se realizó por censo. En consecuencia, se estudiaron 153 pacientes. Para recopilar los datos se utilizó

una lista de verificación que consta de datos demográficos e información relacionada con la implementación de las pautas de gestión de MI. Los datos fueron analizados por SPSS, versión 23, software y estadística descriptiva.

Resultados: 77.1% (118) de los pacientes eran hombres y 22.9% (35) eran mujeres. La media y la desviación estándar de la edad de los pacientes fueron 60.58 ± 12.43. Con respecto a los índices de tiempo para recibir servicios, los resultados del estudio mostraron que la puerta para codificar el TIEMPO (tiempo de ingreso del paciente al hospital para la activación del código 247) fue de 12,36 ± 6,25 en este estudio, que debería ser inferior a 10 minutos. Además, la duración del tiempo de puerta al dispositivo (tiempo transcurrido entre la llegada del paciente con infarto agudo de miocardio hasta la realización de la angioplastia) fue de 180 minutos en el presente estudio, que debería ser inferior a 90 minutos.

Conclusión: Las pautas para el manejo del infarto de miocardio (247) no fueron ideales en algunos de los indicadores en el estudio que unen que las barreras y desafíos efectivos deben ser estudiados y mejorados. También se recomienda que estos protocolos se evalúen continuamente para proporcionar una mejor eficacia.

Palabras clave: Infarto de miocardio, guías, evaluación, angioplastia.

Introduction

Cardiovascular diseases are considered as the most common and important cause of death worldwide and is recognized as a worldwide epidemic disease[1]. Cardiovascular disease caused 25 million deaths and 293 million DALYs (Disability Adjusted Life Years) in 2010[2]. According to the same statistics, cardiovascular disease is reported to be the cause of 35% of deaths and 17% of DALYs[3]. Myocardial infarction (MI), also known as a heart attack, occurs when blood flow decreases or stops to a part of the heart, causing damage to the heart muscle[4]. Myocardial infarction is a cardiac emergency that if left untreated, could cause the death of the patient or cause suffering life-long complications in the case of survival, which can incur significant costs for the individual, family, and society[5]. Myocardial infarction, which is associated with the ST segment elevation in electrocardiogram, is called STEMI (ST elevation MI), which is the most severe and life threatening manifestation of acute coronary syndrome. Since the time of initiation of treatment plays a role in preventing its morbidity and mortality, diagnosis and initiation of treatment should be made promptly[6]. According to the latest published worldwide statistics, approximately 25 - 40% of cases of acute myocardial infarction are associated with ST elevation and in recent years, its treatment has changed from pharmacologically to largely mechanical treatments which along with advances in drug therapy, it has caused a significant decrease in its mortality rate[7,8]. The standard treatment for a STEMI stroke patient is immediate reperfusion[9] with the aim of preventing myocardial necrosis and rescuing at-risk myocardium, reducing the incidence of heart failure and ultimately prolongs the patient's life span[10]. As cardiac cell function declines in the event of persistent occlusion of the involved vein, prompt treatment with adherence to treatment standards and reperfusion is required[11]. Reperfusion is performed by two methods of thrombolysis (Thrombolytic Therapy), and primary percutaneous coronary intervention (PCI). Thrombolytic Therapy is preferred to PCI if appropriate facilities are present. Numerous clinical studies have demonstrated the preference for primary angioplasty (PCI) therapy over thrombolytic therapy in reducing complications, recurrent stroke, and disease-related death[12].

Although primary angioplasty seems to be more costly than thrombolytic therapy, it is quite effective considering the followings: The number of patients requiring intervention after receiving thrombolytic therapy is higher than patients who have undergone PCI. The length of hospitalization for thrombolytic therapy is also longer than PCI[13].

Considering the importance of time in emergency services in acute myocardial infarction patients, measures should be taken to manage the time duration of treatment in these patients so that unnecessary processes should be eliminated and early interventions should be taken at the least possible time[14]. Accordingly, the Deputy of Health of Iran's Ministry of Health and Medical Education has formed a committee to manage the treatment of acute stroke patients and has issued guidelines for the management of acute myocardial infarction (code 247).

Code 247 is a Hospital with the capability of providing Primary PCI that provides full-time services in 24 hours a day[15]. The primary purpose of the guidelines for the management of acute myocardial infarction (code 247) is to shorten the time of service delivery through time management and modify early processes to access definitive treatment in STEMI patients. Implementation of the code 247 will play an important role in preventing myocardial necrosis and reducing the incidence of heart failure following acute MI and will lead to a longer life and quality of life in acute MI patients. Since no study has been conducted on the implementation and evaluation of acute myocardial infarction management indices (code 247) in Iran, therefore, due to the importance of the subject, this research decided to conduct a study aimed at assessing the acute myocardial infarction management guidelines (code 247) in patients admitted to the cardiology department of Valiasr Hospital in Fasa in southwestern Iran in 2019.

Materials and methods

This study was a cross-sectional study that evaluated the trends and indicators of acute myocardial infarction management code (code 247) for 15 months from April 2018 to June 2019. Subjects included all patients with acute myocardial infarction (transferred with pre-hospital emergency, referral from hospitals neighboring cities with pre-hospital emergency, direct patient referral and hospitalized patients). Sampling was done by census and based on this, 153 patients were studied. A checklist including demographical data and indicators of acute myocardial infarction management guidelines were used to collect data. Data were analyzed using SPSS, version 23.0, software and descriptive statistics.

Results

Of 153 patients with acute myocardial infarction, 77.1% (118) were male and 22.9% (35) were female. Mean and standard deviation of age were 60.58+12 12.43. 21.21% (60 patients) of patients were referred to the hospital by ambulance. 22.87% (35 patients) of patients were transferred by ambulance from neighboring cities to the hospital. 31.37% (48 patients) of patients had referred to the hospital personally and had not contacted the emergency center. 6.53% (n=10) of patients had been hospitalized in the cardiology department of the hospital.

Considering the location of myocardial infarction, 49.67% (n=76) of patients had inferior MI, which had the highest frequency compared to other locations in heart (Table 1).

Table 1. Type of Myocardial Infarction

Type	N	%
Anterior	64	41.83
Lateral	3	1.96
Inferior	76	49.67
Posterior	2	1.30
Anterolateral	3	1.96
Global MI (Anterior, Lateral, Inferior)	5	3.26
Total	153	100

Concerning the type of interventions performed, the results of the study showed that 130 patients had primary PCI. Other treatments have been listed in (Table 2).

Table 2. Type of Intervention performed

Type	N	%
Primary PCI	130	89.5
Rescue PCI	10	6.53
Urgent CABG	7	4.57
Primary PCI followed by CABG	4	2.61
None	2	1.30
Total	153	100

Regarding the use of thrombolytic, the results of the study showed that 10 (6.53%) patients received thrombolytic therapy, which 7 (4.57%) of them received streptokinase (SK) and 3 (1.96%) of them received Reteplase (is a new thrombolytic agent) Additional treatment has been provided in (Table 3) addition to the mentioned interventions.

Table 3. Additional treatments from symptom onset to coronary intervention

Additional treatments	N	%
Transvenous pacemaker	2	1.30
Ventilator Support	3	1.96
IABP	2	1.30
Cardioversion / Defibrillation	4	2.61
Inotropes	6	3.92
External pacemaker	4	2.61
CPR	2	1.30
None	130	84.96
Total	153	100

On the efficacy of angioplasty in coronary artery reperfusion based on TIMI (Thrombolysis in Myocardial Infarction) index, the results of the study showed that in 141 patients (92.15%) the TIMI index was third grade after performing angioplasty, indicating the effectiveness of the angioplasty (Table 4).

Table 4. Final TIMI grade flow in Infarct related artery

Grade	N	%
Grade 0	4	2.61
Grade 1	2	1.30
Grade 2	6	3.92
Grade 3	141	92.15
Total	153	100

Concerning the timing indices of receiving services, the results of the study showed that the duration of Door to Code TIME (duration of patient admission to hospital until activation of code 247) was 12.36±6.25 min, which should be less than 10 min. Also, the duration of the Door to Device Time (time between arrival of the patient with acute myocardial infarction until performing angioplasty) was 180 min in the present study, which should be less than 90 min.

Discussion

Acute myocardial infarction is one of the most common and important cardiovascular disorders that, despite medical advances, is still one of the major health problems around the world[16]. The major consequence of acute myocardial infarction is functional disability disorder of patients and limitation in occupational, family and social duties and ultimately a decline in patients' quality of life[17]. Regarding that the acute myocardial infarction is one of the most important and serious emergency events, performing the effective interventions could play a very important role in reducing the complications of the disease.

The purpose of this study was to evaluate the efficacy of acute myocardial infarction management indices in patients referred to the cardiology department of a teaching hospital in southwestern Iran. The results of the present study showed that about 32% of patients with acute myocardial infarction had referred to the hospital without contacting the emergency department, which could lead to permanent complications of acute myocardial infarction. Therefore, it seems that awareness of acute myocardial infarction should be raised by public education and public awareness so that the acute complications of disease could be prevented by taking the right action and the effects of medical interventions could be improved. The results of the study by Huriani (2019) also showed that raising the level of awareness of patients and their caregivers at home can play an important role in taking correct action during attacks of acute myocardial infarction, which is effective in reducing the serious complications of the disease[18]. The results of the study by Manap et al. (2018) also showed that patients' level of awareness plays an important role in improving cardiac function indicators and accelerates the treatment process and reduces the acute complications of the disease[19]. Concerning the time of patient's referral to the hospital until performing PCI (Door to Device Time), the results of this study showed that this time was longer than the standard 90 minute. The reasons for prolonging the time of angioplasty is to refer patients from neighboring cities for angioplasty. Due to the long distance, it takes time to get to the treatment center (sometimes up to three hours). The results of the study by Salarifar et al. (2019) also showed that one of the ways to reduce the time of performing angioplasty is to allocate the facilities and equipment needed to perform PCI in health centers and to plan and deploy acute myocardial infarction management services[20]. The results of the study by Park et al. (2019) also indicated that the best time to perform PCI in patients with acute myocardial infarction is 60-90 min, and the longer this duration, the lower the effectiveness was. Therefore, it is important to identify and eliminate factors that may delay this medical intervention[21]. In the present study, 12 (7.84%) patients had grade 3 TIMI before performing PCI. After PCI, 141 (92.15%) of patients had grade 3 TIMI, indicating the efficacy of PCI in improving coronary artery perfusion. In the study of Ahmadi et al. (2016), after PCI, TIMI index was grade 3 in 74.7% of patients[22]

Conclusions

Implementation of the management guidelines for the treatment of acute myocardial infarction (code 247) will play an important role in preventing serious complications and reducing medical costs. Although most indices were favorable in the studied health center, it is necessary to aware public on how to treat acute myocardial infarction and to provide the necessary facilities and equipment in most medical centers in order to reach the access to health care to the least possible time, so that the treatment will be more effective.

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