

Analysis of the Behavior of Acute Myocardial Infarction during 2016. Hospital “Mártires del 9 de Abril”. Sagua la Grande. Villa Clara. Cuba

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Abstract

Introduction: Knowing the clinical characteristics of AMI is essential to undertake actions in its prevention, diagnosis and treatment.

Objective: To identify some clinical epidemiological characteristics of acute myocardial infarction in people admitted at “Mártires del 9 de Abril” General Teaching Hospital in Sagua la Grande.

Method: A retrospective descriptive study was carried out in 77 patients diagnosed with acute myocardial infarction and admitted at “Mártires del 9 de Abril” Hospital in 2016. The information was collected through a Data Collection Model of the clinical records of patients with AMI. The variables studied were: age groups, sex, risk factors, infarct topography, fibrinolytic treatment, patient’s status at discharge and lethal complications. Data analysis was carried out using descriptive statistics with absolute and relative frequency and summary measure.

Results: Male sex and the age group of 60-69 were the ones that prevailed. Age, smoking, dyslipidemia, hypertension, diabetes mellitus and APF were the most common risk factors. The most frequent location of AMI was in the anterior face; more than 80% of the patients were thrombolized. Mortality was higher in the male sex and increased with age, mainly due to cardiogenic shock.

Conclusion: Male sex is the most affected one by acute myocardial infarction; cardiovascular risk factors are directly related to the onset of this disease. It is important to know the behavior of this disease to have a direct influence in order to reduce morbidity and mortality.

Keywords: Myocardial Infarction; Heart Attack; Infarcts; Myocardial; Cardiac Attack

Introduction

Cardiovascular diseases are a serious epidemiological problem in the contemporary world [1]. Ischemic heart disease has been the biggest health problem and the main cause of death in many countries of the world for several decades. At the beginning of the 20th century, these caused less than 10% of all deaths in the world and in this century, they are responsible for almost half of the deaths in developed countries, as well as 25% in the countries in of development [2]. In 2015, it is estimated that 17.7 million people died, of these more than three quarters occurred in developing countries [3]. The report of the Ministry of Health of the Americas (NHANES), published In 2016, the number of patients with coronary heart disease was estimated at 15.5 million, with a prevalence of 6.2% in subjects over 20 years of age (7.6% men and 5% women) [4]. In the United States, it is estimated that 600,000 new Acute Infarctions occur. of the Myocardium (IMA) each year, of which 25% present with a silent clinical profile and 320,000 as episodes of exacerbation of ischemic heart disease (AMI and acute unstable angina). Of the totality of AMI that occur annually in the United States, mortality is reported around 25% [2].

Thus, coronary heart disease continues to be the leading cause of death in developed countries (three out of every four deaths are cardiovascular) and it is estimated that in 2020 it will be the first cause of death worldwide.

In Ecuador cardiovascular diseases occupy the first place among the causes of mortality, and among them the most feared disease is AMI, its incidence is close to 40,000 people per year, which would mean that every 12 minutes an Ecuadorian suffers a heart attack [2].

In Cuba, in 2016, heart disease occupied the first cause of death with a total of 24,462 deaths, 66.05% due to ischemic diseases; and of these, 44.42% due to acute myocardial infarction. The provinces with the highest incidence were Havana, Santiago de Cuba, Matanzas, Holguín and Villa Clara [6].

The incidence of coronary disease is more frequent in men, being the proportion with respect to women of 2: 1 or more [7].

The definition of acute coronary syndrome encompasses the spectrum of conditions compatible with acute myocardial ischaemia and/or infarction, due to the abrupt reduction of blood flow [8]. AMI is the necrosis of myocardial cells as a consequence of prolonged ischemia produced by the sudden reduction of the coronary blood supply, which involves one or more areas of the myocardium [8-11]. It is evidenced clinically by chest pain of 20 minutes or more in duration, by serological markers and by electrocardiographic changes. The presence of two of these three elements allows the diagnosis to be made [8,9]. Changes in the electrocardiogram (ECG) in relation to AMI can be observed in the 12-lead registry. Among the findings to be found are: new ST-segment elevation greater than 1 mm (0.1 mV) in two or more contiguous leads: in leads V2-V3 > 2 mm (0.2 mV) in men and > 1, 5 mm (0.15 mV) in women. BRI of the Beam of His (BRIHH) of new appearance and suggestive history of IAM. ST-segment depression of V1-V4 and history suggestive of AMI that may correspond to an inferobasal (posterior) AMI. We must consider, in the early phase of AMI, the appearance of giant T waves (hyperacute), even without ST segment elevation [8]. Treatment is based on early myocardial revascularization, either by invasive coronary recanalization procedures or thrombolytic drugs. When the thrombosis lysed, the coronary flow is reestablished, which is guaranteed to reduce ventricular dysfunction and thereby reduce mortality [12].

Although different studies have shown greater survival in the short and long term for surgical revascularization compared to drugs, if they are applied early, all agree that the earlier you use better results, the longer the time will be. benefits that are obtained [8]. That is why when you do not have the means to perform the surgical revascularization, you should start immediately with the medication, which would bring more benefits than if you wait longer to transfer the patient to the hospital. a unit where there are means for surgical intervention.

On the basis of the above, the authors set out to design a study to analyze the behavior of acute myocardial infarction in the general teaching hospital "Mártires del 9 de Abril" in Sagua la Grande given the importance for Cuban public health of knowledge of these aspects with a view to the work of prevention, diagnosis, timely treatment and rehabilitation carried out by family medicine in the country.

Methods

A retrospective descriptive study of all adult patients, older than 18 years of age, of both sexes, diagnosed with acute myocardial infarction, admitted to the Teaching General Hospital "Mártires del 9 de Abril" of Sagua la Grande during the 2016.

The study population consisted of 77 patients who had presented this cardiological emergency. The sample coincided with the population. Among the variables studied were: age groups, sex, cardiovascular risk factors present, infarct topography, fibrinolytic treatment, patient's discharge status and lethal complications.

For the processing of the information, the EPIDAT statistical program package was used with a reliability of 95% and a margin of error of 5%. In addition, the percentage was used as a summary measure and a survey prepared for this purpose.

Semantic control

The electrocardiogram data for the diagnosis and localization of IAM CEST are fundamental. The location of the infarction is very important to identify the area at risk and the size of the infarct.

Location of the infarction according to the presence of Q wave or ST segment elevation [13].

Wave Q or elevation of the ST Segment	Localization
DII, DIII, AVF	Lower
DI y AVL	Lateral high
V1, V2, V3	Anteroseptal
V1, V2, V3, V4	Previous
V4, V5, V6	Antero lateral
V3, V4, V5	Antero apical
R high and ST elevation in V1 and V2 or ST elevation in V7, V8, V9	Upper side
V3 and V4 right	Right ventricle

Results

It was found that the highest incidence of AMI was the age group of 60 - 69 years (33.77%), followed by 70 - 79 years (28.57%). The sex most affected was male (66.23%). The most affected age groups according to sex were 60 - 69 years in the female sex (14.29%) and 70 - 79 years in the male sex (22.08%), with no cases reported in children under 18 years of age. 20 years nor in the age group of 30 - 39 years (Table 1). 5.6% of the cases presented Acute myocardial infarction without segment elevation (NSTEMI).

Age group (years)	Female		Male		Total	
	Nro	%	Nro	%	Nro	%
20 - 29	-	-	1	1,30	1	1,30
40 - 49	2	2,60	3	3,90	5	6,50
50 - 59	3	3,90	7	9,09	10	12,99
60 - 69	11	14,29	15	19,48	26	33,77
70 - 79	5	6,49	17	22,08	22	28,57
≥ 80	5	6,49	8	10,39	13	16,88
Total	26	33,77	51	66,23	77	100,00

Table 1: Distribution of patients with AMI according to age and sex groups. Teaching General Hospital "Mártires del 9 de Abril". January to December 2016.

Source: Model of data collection of the clinical histories of patients with AMI. Teaching General Hospital "Mártires del 9 de Abril".

The incidence of AMI was related to relevant vascular risk factors, mostly non-modifiable (age 92.20%), smoking was present in 52 patients (67.53%), Dyslipidemia in 45 patients (58.44%), High blood pressure in 33 patients (42.86%), Diabetes mellitus in 32 patients (41.56%), APF in 9 patients (11.69%). It is important to note that in 33 patients (55.93%) 2 or more of these risk factors coexisted (Table 2).

Risk factors	Nro	%
Age ≥ 50	71	92,20
Smoking	52	67,53
Dyslipidemia	45	58,44
HBP	33	42,86
DM	32	41,56
HHF	9	11,69
Others	7	9,09

Table 2: Distribution of patients with AMI according to risk factors. Teaching General Hospital "Mártires del 9 de Abril". January to December 2016.

Source: Model of data collection of the clinical histories of patients with AMI. Teaching General Hospital "Mártires del 9 de Abril".

* HBP: High Blood Pressure; DM: Diabetes Mellitus; HHF: Family Health History

According to the reviewed clinical histories, anterior AMI was the most frequent and presented in 31 patients (40.26%), followed by the inferior one with 22 patients (28.57%), lateral 13 patients (16.88%) and other locations 11 patients (14.29%) (Table 3).

Topography	Nro	%
Anterior	31	40,26
Inferior	22	28,57
Lateral	13	16,88
Other locations	11	14,29
Total	77	100,00

Table 3: Distribution of patients according to topography of the AMI, General Teaching Hospital "Mártires del 9 de Abril". January to December 2016.

Source: Model of data collection of the clinical histories of patients with AMI. Teaching General Hospital "Mártires del 9 de Abril".

80.52% of the patients received fibrinolytic treatment with recombinant streptokinase at 1,500,000 U in 100cc of 5% dextrose at 30 - 60 min IV. The causes of non-use of reperfusion treatment were AMI without ST-segment elevation, especially in females, severe arterial hypertension, major surgery in less than 3 weeks, a delay of more than 12 hours from onset of pain to who went to the hospital center, and NSTEMI.

Thrombolized patients	Female		Male		Total	
	Nro	%	Nro	%	Nro	%
Yes	20	31,17	42	58,44	62	80,52
No	6	2,60	9	7,79	15	19,48
Total	26	33,77	51	66,23	77	100,00

Table 4: Thrombolytic therapy with recombinant streptokinase. Teaching General Hospital "Mártires del 9 de Abril". January to December 2016.

Source: Model of data collection of the clinical histories of patients with AMI. Teaching General Hospital "Mártires del 9 de Abril".

The state of the patient at discharge is shown in table 5, where a total of 8 deceased persons (10.39%) is evidenced; mortality was higher in the male sex with 6 patients (7.79%). Only 1 of the deceased received fibrinolytic treatment.

State at discharge	Female		Male		Total	
	Nro	%	Nro	%	Nro	%
Alive	24	31,17	45	58,44	69	89,61
Deceased	2	2,60	6	7,79	8	10,39
Total	26	33,77	51	66,23	77	100,00

Table 5: Patient's status at discharge. Teaching General Hospital "Mártires del 9 de Abril". January to December 2016.

Source: Model of data collection of the clinical histories of patients with AMI. Teaching General Hospital "Mártires del 9 de Abril".

The highest number of deaths was in the groups of ages ≥ 80 years with 5 deceased (62.57%) followed by the group of 70 - 79 years with 2 deceased (25.00%) and the group of 60 - 69 years with 1 deceased (12.50%), the death was related to the lethal complications of AMI, where the most affected was the cardiogenic shock with 5 patients (62.50%), followed by the III degree AV block with 2 patients (25.00%) and electromechanical dissociation with 1 (12.50%) (Table 6).

Lethal complications	Age Groups						Total	
	60 - 69		70 - 79		≥ 80			
	Nro	%	Nro	%	Nro	%	Nro	%
Cardiogenic shock	-	-	1	12,50	4	50,00	5	62,50
AV Blocking of III degree	-	-	1	12,50	1	12,50	2	25,00
Electromechanical dissociation	1	12,50	-	-	-	-	1	12,50
Total	1	12,50	2	25,00	5	62,50	8	100,00

Table 6: Lethal complications of AMI according to age group. Teaching General Hospital "Mártires del 9 de Abril". January to December 2016.

Source: Model of data collection of the clinical histories of patients with AMI. Teaching General Hospital "Mártires del 9 de Abril".

Discussion

As expected, the incidence of AMI was greater as the ages of the patients increased, especially at ages over 60 years, where a higher incidence of cardiovascular risk factors is described [1,2,8]. Of equal More than half of the study universe belonged to the male sex, in which several authors describe a progression at younger ages of coronary artery disease compared to the female sex, which is related to the emergence of risk factors cardiovascular and not having the protection from the hormonal point of view women present through estrogen [1,2,10,14,15]. Although several bibliographies agree that from the menopausal age of the woman the difference in the incidence of coronary diseases is erased [5,10,14,15], the present study differs from this since after 60 years the incidence of AMI in men was almost twice as much as in women (40/21), it is important to point out that at these ages, in our study, there were more risk factors in men than in women. The serologic markers used for the diagnosis were CK-T and CK-MB. Several authors agree that an increase of these markers above the 99th percentile are diagnostic criteria, and in the case of reinfarction, it is the CK-MB that reports the most data [8,9,11].

90.20% of the patients were over 50 years old. The most frequent risk factor was the habit of smoking in (67.53%), coinciding with other authors who have also found high rates of smoking [2,16]. Smoking is accepted as a risk factor for the development of cardiovascular diseases and a direct cause of AMI [2,5,12,16]. In general, in these patients smoking cessation is difficult to achieve in the long term and the resumption of it is frequent. In Cuba, smoking cessation consultations are working, which has given very good results in the treatment of this addiction, although it is still insufficient.

Other risk factors that were found were dyslipidemia, HBP and DM; These risk factors sometimes coexist at the same time, as happened in 55.93% of patients in the present study. This coincides with that found by other authors [17-20]. More than 50% of these patients had high blood pressure, lipemia or blood glucose levels, it is important to note that these patients, for the most part, had been with these factors for more than 2 years. risk and that the fundamental cause of the decompensation of the same was in the non-adherence to the treatment. In different studies, it has been observed that several risk factors are more likely to develop an AMI than individuals with only one of them, and when there is decompensation, this risk increases [2,19-21].

Regarding the topography, the location of the anterior infarction was the most frequent among the patients studied, which affects the left ventricular mass, commonly associated with complications. These patients often die before arriving at the emergency services or within a few hours of their arrival [2]. In the order of frequency, they followed the lower location AMI, which generally has a more favorable evolution, since a lower incidence is affected. Portion of the ventricular mass [2]. To a lesser extent, lateral-area AMIs and those of other locations were diagnosed. The results of this study have been quite similar to others performed in those that present, also more frequently, anterior topographic infarcts [12,16,19]. In other studies they have found a significant prevalence of the inferior location [22].

The treatment used after admission was oxygen therapy, to remove the pain, intravenous bolus morphine was used from 2 to 4 milligrams, repeated in 2-milligram boluses every 15 minutes, until analgesia was achieved, closely monitoring the hemodynamic and ventilatory status, nitroglycerin: 1 tablet (0.5 mg) sublingual entry repeated every 5 minutes for 3 - 4 doses. It was not used with systolic arterial pressure (SBP) less than 90 mmHg or heart rate (HR) less than 50 or greater than 100 beats per minute (bpm) and suspicion of right ventricular (RV) AMI. Beta-blockers (BBA): Atenolol: initial oral dose of 50-100 mg every 24 hours. only 5 mg IV initial dose was used followed by the oral dose at the time, in certain clinical situations (hypertension, tachyarrhythmias, non-tolerance of the oral route) (except in asthmatic patients), aspirin in a 250 mg chewed and ingested dose. Early myocardial revascularization with thrombolytic drugs, in this case with recombinant streptokinase, was the treatment of choice. The primary Percutaneous Coronary Intervention (PCI) is not available at the index hospital. 80.52% of patients diagnosed were treated early with chemical reperfusion therapy with recombinant streptokinase, several authors agree that when there is no possibility of performing surgical recanalization in the first hour of the examination, the best option is the use of chemical thrombolysis, since every hour that is delayed in restoring coronary circulation, the greater the percentage of lost muscle mass [4,8,23], which guarantees a better survival and quality of life. Mortality found by this condition was 10.39%, which

is lower than that found by some authors, who describe a mortality after hospitalization for AMI close to 30% [22-24], while coinciding with that found in recent studies which reflects a 4 - 12% mortality [24], this lower percentage of deaths could be in correspondence to early diagnosis and early revascularization by thrombolysis, some authors report that patients receiving early fibrinolytic treatment have less chance of reinfarction and even the death in relation to patients who do not receive it [8,23,25-27]. Although it is pertinent to report that in this study only patients admitted with a diagnosis of AMI were analyzed, the incidence of AMI patients who died before arrive at the hospital and they were not admitted. The main lethal complications occurred in individuals older than 60 years and it was increasing as age increased, being the most affected those over 80 years old, which agrees with that found in other studies [28], owing largely to the confluence of coronary risk factors in this group of patients and the comorbidity that they commonly present. The main cause of death was the cardiogenic Shock, some authors agree that this is the most lethal complication of transmural AMI [26-28], the second most lethal complication was the III-degree AV block, the studies show that patients with peri-infarction AV block have a higher intrahospital mortality than patients with preserved AV conduction [22], one of this patient died from ventricular fibrillation and one from congestive heart failure refractory to treatment, the last lethal complication was electromechanical dissociation.

Conclusions

The male sex is the most affected by AMI, the cardiovascular risk factors have an influence directly proportional to the appearance of this disease and as the age advances the lethal complications appear more frequently. Early revascularization is the treatment of choice. It is important to know the behavior of this disease in the population to have a direct impact on the promotion, prevention, early diagnosis and timely treatment of it, in order to reduce mortality and disability due to this cause.

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