

Indicators of quality of care in patients with acute myocardial infarction by sex

Abstract

Introduction: Cardiovascular diseases cause almost 4 million deaths per year in Europe, most of them due to coronary heart disease, which corresponds to 47% of all deaths.

Objective: To characterize the quality of care indicators proposed by ACC/AHA and ESC in patients admitted for Acute Myocardial Infarction in the Coronary Care Unit according to sex of the Sancti Spiritus Camilo Cienfuegos Provincial General Hospital in the period January 2019 to January 2022.

Method: A descriptive, cross-sectional investigation was carried out. The population and sample were made up of 341 patients with Acute Myocardial Infarction, diagnosed, treated and registered in the Registry of Acute Myocardial Infarction (RESCUE) corresponding to the province of Sancti-Spiritus, in the aforementioned period.

Results: The affected patients were more frequently male, with a mean age of 67.5 years prevailing, with hypertension as the most prevalent comorbidity, the Killip-Kimball I class obtained the highest report in the study, prevailing of the electrocardiogram before arrival at the reperfusion center, with reperfusion therapy being performed in the hospital in the majority of patients. The 89.44% reported having received very good care in the treatments they received.

Conclusions: The patients admitted for Acute Myocardial Infarction in the Coronary Care Unit were characterized according to sex, highlighting that the majority of patients were between 50 and 59 years old, were male had high blood pressure, a functional class II and good adherence therapy.

Keywords: quality indicators, acute myocardial infarction, patient care

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Abbreviations: GPC, clinical practice guidelines; ACC, American College of Cardiology; AHA, American Heart Association; ESC, European Society of Cardiology; RESCUE, acute myocardial infarction registry; PERSTEMI, Peruvian Registry of ST-segment elevation myocardial infarction; IAM, acute myocardial infarction; STEMI, ST-segment elevation myocardial infarction; IMCEST, ST-segment elevation myocardial infarction

Introduction

Quality of care indicators for patients with acute myocardial infarction in a coronary care unit are important because they help to improve the quality of patient care and provide adequate quality of life.¹

The quality of health care is something that has long, if not always, been of concern to health care professionals who in one way or another have worked with a view to striving for excellence, even without using a specific and recognised methodology.²

In medicine, it is very difficult to assess the quality of patient care, since courteous, kind and paternal treatment is not always accompanied by an adequate selection of appropriate diagnostic and therapeutic measures, nor by the prudent and careful performance of technical procedures. A permanent concern for the delivery of medical services, and an adequate evaluation of the care provided to patients, will result in the quality of the care provided.³

The conceptual and methodological bases on the quality of care have been justified in the model developed by Donabedian,

who analyses this process from three classic approaches (structure, process and results), which is currently the dominant paradigm for the evaluation of health care. The evaluation of the functioning of services, derived from the application of these approaches, allows for an orderly measurement of the variables linked to the quality of health services.¹

Cardiovascular diseases cause almost 4 million deaths per year in Europe, most of them due to coronary heart disease, which accounts for 47% of all deaths. In the United States, it has been estimated that approximately 15.4 million people over the age of 20 have IHD and it accounts for approximately 1 in 7 deaths in the USA each year.⁴

In Cuba, for more than 40 years, heart diseases have been one of the leading causes of death, with ischaemic heart disease having the greatest impact, with a total of 18,572 deaths in 2020.⁵

Quality indicators in cardiology are tools to assess the quality of treatment, including clinical processes and outcomes. They can also be used to improve adherence to recommendations proposed in clinical practice guidelines (CPGs) through the efforts and benchmarking of healthcare professionals. Therefore, the role of quality indicators in quality improvement is increasingly recognised and attracting the interest of health authorities, professional organisations, patients and the general population.⁶⁻⁸

For the aforementioned reasons, our objective was to characterise the quality of care indicators proposed by the American College of Cardiology and the American Heart Association (ACC/AHA) and the European Society of Cardiology (ESC) in patients admitted for acute

myocardial infarction to the Coronary Care Unit according to sex at the Camilo Cienfuegos Provincial General Hospital in Sancti Spiritus from January 2019 to January 2022.

Methods

A descriptive, cross-sectional study was conducted to characterise the behaviour of the quality of care indicators proposed by the American College of Cardiology and the American Heart Association (ACC/AHA) and the European Society of Cardiology (ESC) in patients admitted for acute myocardial infarction to the Coronary Care Unit of the Camilo Cienfuegos Provincial General Hospital in Sancti Spiritus between January 2019 and January 2022.

The sample consisted of the 341 patients with Acute Myocardial Infarction, diagnosed, treated and registered in the Acute Myocardial Infarction Registry (RESCUE) corresponding to the province of Sancti-Spíritus, in the period from January 2019 to January 2022.

Inclusion criteria

Patients with Acute Myocardial Infarction, diagnosed, treated and registered in the RESCUE, corresponding to the province of Sancti-Spíritus, in the period from January 2019 to January 2022.

Exclusion Criteria

Patient with incomplete data, loss of data in RESCUE, or transfer to other services, prior to hospital discharge given by the Provincial Cardiology Service.

Patients admitted with more than 1440 minutes (24h) of symptom onset time, either due to patient delay or inability of the system to diagnose.

Descriptive statistical methods were used to tabulate the empirical data obtained in the research, to determine the absolute and relative frequencies of each variable and to study their behaviour, when processing the information obtained after the application of the empirical methods.

Once the data has been collected, a database will be created, using the Microsoft office Excel programme, with the variables selected in

the study, and the results will be presented in tables and graphs for better understanding.

To obtain the research data on the characterisation of the behaviour present in the quality of care indicators proposed by ACC/AHA and ESC in patients admitted for Acute Myocardial Infarction in the Coronary Care Unit of the Camilo Cienfuegos Provincial General Hospital of Sancti Spiritus in the period from January 2019 to January 2022, the data will be obtained from RESCUE as the sole source of information.

The study was conducted in accordance with the ethical principles for medical research in humans, established in the Declaration of Helsinki as amended by the 59th General Assembly in Seoul, Korea, and accepted by Cuba. The research carried out was based on the absolute respect of the postulates of ethics, a purely scientific purpose, without affecting the environment or predictable risks. The information obtained will not be used for other purposes outside the framework of the research. The anonymity of all information collected from patients was respected after informed consent was obtained.

Results

The indicators of quality of care in patients with acute myocardial infarction according to age and sex show a predominance of the male sex with 70.9 % of patients and 29.0 % of patients in the female sex. In terms of age, the male sex had a mean of 64.5 and the female sex a mean of 67.5. (Table 1)

The patients with acute myocardial infarction are shown according to Killip-Kimball class at admission, where most of them attended with Killip-Kimball class, representing 79.4 % of the patients, followed in order of frequency by class IV with 10.8 %. In the case of the female sex the Killip-Kimball Class at admission reported class I with 70.7% and the male sex 83.0%. (Table 2)

The patients with acute myocardial infarction are shown according to comorbidities or underlying pathologies where 87.3 % presented arterial hypertension, followed in order of frequency by smoking with 45.7 %, angina with 27.2 %, diabetes mellitus with 26.6 %. The remaining factors were reported in lower percentages. (Table 3)

Table 1 Quality of care indicators in patients with acute myocardial infarction according to age and sex. Sancti Spiritus coronary care unit. January 2019 to January 2022

Features	Female (N=341)	Male (N=341)
Years (Average)	67,5 (57-73)	64,5 (55-72)
Total	99 (29.0%)	242 (70.9%)

Source: RESCUE.

Table 2 Quality of care indicators in patients with acute myocardial infarction according to Killip-Kimball Class at admission. Sancti Spiritus coronary care unit. January 2019 to January 2022

Killip-Kimball Class	Female		Male		Total	
	No	%	No	%	No	%
I	70	70,7	201	83,0	271	79,4
II	7	7,0	17	7,0	24	7,0
III	5	5,0	4	1,6	9	2,6
IV	17	17,1	20	8,2	37	10,8
Total	99	29,0	242	70,9	341	100

Source: RESCUE.

Table 3 The patients with acute myocardial infarction are shown according to comorbidities or underlying pathologies

Comorbidities	Female (N=99)		Male (N=242)		Total	
	No	%	No	%	No	%
Diabetes Mellitus	35	35,3	56	23,1	91	26,6
Smoking habit	34	34,3	122	50,4	156	45,7
Heart failure	2	2,0	3	1,2	5	1,4
Chronic renal insufficiency	2	2,0	5	2,0	7	2,0
Obesity	2	2,0	5	2,0	7	2,0
Cerebrovascular disease	7	7,0	4	1,6	11	3,2
Arterial Hypertension	91	91,9	199	82,2	298	87,3
Angina	35	35,3	58	23,9	93	27,2
Peripheral vascular disease	10	10,1	7	2,8	17	4,9

Source: RESCUE.

The indicators of quality of care in patients with acute myocardial infarction according to pre-hospital electrocardiogram and at the reperfusion centre show that 73.6% had an electrocardiogram before arrival at the reperfusion centre and only 29.0% had an electrocardiogram at the reperfusion centre. (Table 4)

The indicators of quality of care in patients with acute myocardial infarction according to reperfusion therapy are shown. Patients with reperfusion therapy where 57.4 % of the patients underwent reperfusion therapy, 41.9 % of men and 27.0 % of women. Without reperfusion therapy 30.7 %. Of the 196 patients who underwent reperfusion therapy, 15.5 % were pre-hospital and 41.9 % of them underwent in-hospital reperfusion therapy. The same table shows ischaemic time and system delay time, with ischaemic time greater than 120 minutes in 41.3 % of patients and ischaemic time less than or equal to 120 minutes in 16.1 %. System delay time less than or equal to 90 minutes was reported in 36.0 % of cases, and greater than 90 minutes in 21.4 %. (Table 5)

Indicators of quality of care in patients with acute myocardial infarction are shown according to discharge status and medical treatment of those discharged, where 89.4 % were discharged alive and 10.5 % died, with the highest number of deaths in men (52.7 %). It is important to note that during hospitalisation there were patients who did not have time to start this important medication. The medical treatment received in the discharged patients was highest in patients with aspirin and statins with 88.8 %. The indicators of quality of care in patients with acute myocardial infarction according to treatment and readmissions are also reported, showing that 51.0 % of the patients had failure in at least one of the drugs, 48.9 % of the patients with complete hospital treatment. Of the patients with complete hospital treatment at discharge, 32.5 % were complicated with heart failure and 20.8 % of the patients with failure of at least one of the drugs. Re-admissions after 30 days due to major complications occurred in 1.4 %, mostly in men (80 %). In terms of quality of treatment care, 89.44% reported receiving very good care in the treatments they received. (Table 6)

Table 4 Quality of care indicators in patients with acute myocardial infarction according to pre-hospital electrocardiogram and at the reperfusion centre. Sancti Spiritus coronary care unit. January 2019 to January 2022

Electrocardiogram	Female (N=99)		Male (N=242)		Total	
	No	%	No	%	No	%
Electrocardiogram performed prior to arrival at the reperfusion center.	71	71,7	180	74,3	251	73,6
Electrocardiogram performed in the reperfusion center.	28	28,2	71	29,3	99	29,0

Source: RESCUE.

Table 5 Quality of care indicators in patients with acute myocardial infarction according to reperfusion therapy and according to ischaemic time and system delay time. Sancti Spiritus coronary care unit. January 2019 to January 2022

Reperfusion therapy	Female		Male		Total (N=341)	
	No	%	No	%	No	%
Reperfusion Therapy Patients	53	27,0	143	41,9	196	57,4
Patients without Reperfusion Therapy	35	33,3	70	66,6	105	30,7
Prehospital Reperfusion Therapy Patients (N= 196)	18	33,9	35	66,0	53	15,5
Patients with Reperfusion Therapy in the hospital (N= 196)	35	24,4	108	75,5	143	41,9
Weather	Female		Male		Total	
	No	%	No	%	No	%
Ischemic time less than or equal to 120 minutes	15	27,2	40	72,7	55	16,1
Ischemic time greater than 120 minutes	38	26,9	103	73,0	141	41,3
System delay time less than or equal to 90 minutes	41	33,3	82	66,6	123	36,0
System delay time greater than 90 minutes	12	16,4	61	83,5	73	21,4

Source: RESCUE.

Table 6 Quality of care indicators in patients with acute myocardial infarction, according to status at discharge, medical treatment of those discharged and according to treatment, readmissions and quality of care during treatment. Sancti Spiritus Coronary Care Unit. January 2019 to January 2022

Status as of the balance sheet date	Female		Male		Total	
	No	%	No	%	No	%
Deceased patients	17	47,2	19	52,7	36	10,5
Patients discharged alive	82	26,8	223	73,1	305	89,4
Medical treatment of graduates	Female		Male		Total	
	No	%	No	%	No	%
Aspirin	82/82	100	221/223	99,1	303	88,8
P2Y12 inhibitor	64/82	78,0	194/223	86,9	258	75,6
Statins	82/82	100	221/223	99,1	303	88,8
Beta blockers	73/82	89,0	202/223	90,5	275	80,6
ACEI or ARB	80/82	97,5	214/223	95,9	294	86,2
Treatment	Female		Male		Total	
	No	%	No	%	No	%
Patients with complete hospital treatment*.	40	23,9	127	76,0	167	48,9
Patients with failure of at least one of the drugs	59	33,9	115	66,0	174	51,0
Patients with complete hospital treatment at discharge complicated with Heart Failure*.	38	34,2	73	65,7	111	32,5
Patients with failure of at least one of the following drugs	26	36,6	45	63,3	71	20,8
30-day readmissions due to major complications	1	20	4	80	5	1,4

Source: RESCUE.

*Complete inpatient treatment defined as patients on streptokinase, dual antiplatelet therapy, statins, beta-blockers and ACE inhibitors, unless contraindicated.

Patients with full hospital treatment complicated with Heart Failure Defined as patients on dual antiplatelet therapy, statins, beta-blockers and ACE inhibitors, unless contraindicated.

Discussion

The influence of age and sex on the incidence of acute coronary events has been reported in the medical literature, and the results found in this investigation are similarly observed in other investigations.^{4,5}

In the American region, similar results are observed in relation to age and sex in a prospective, multicentre observational study, sub-analysis of the Peruvian Registry of ST-segment Elevation Myocardial Infarction (PERSTEMI), carried out in Peru, in which it was observed in 396 patients with STEMI that the female sex presented a significantly greater age compared to males.¹

In the medical literature, reference is made to the lower incidence in females before the age of 50 years, after which age the risk begins to equalise with that of males due to the oestrogenic factor which is a protector of the vascular endothelium in premenopausal women, while males are considered a risk factor for developing AMI.^{9,10}

Age is a non-modifiable factor, however, the other modifiable risk factors can be reduced, thus decreasing their summative impact, according to the authors.

Ferrero¹¹ in his study included 250 patients with acute myocardial infarction admitted to the specialised unit with a mean age of 64 years and 64 % of men, according to Killip-Kimball class on admission, the majority attended with Killip-Kimball class I representing 69.4 % of the patients and followed in order of frequency by class IV with 19.8 %, agreeing the data of this research with those of this author.

It is recommended that Killip classes II, III and IV be considered as risks for complications and that the use of recombinant streptokinase

be assessed individually in older adults with acute myocardial infarction, regardless of Killip and Kimball class II and III.¹²

It is a fact that the incidence of Cerebrovascular Disease (CVD) depends on the prevalence and accumulation of risk factors; that is, the greater the number of risk factors, the greater the likelihood of suffering a cardiovascular event. Therefore, the identification of risk factors and their distribution in the population is essential to take preventive measures to significantly reduce the occurrence of CVD.¹³

Sambola¹⁴ reports that there was a higher incidence of hypertension as the most reported comorbidity and male sex (59.3% vs. 40.7%), mainly among those aged 45-64 years in patients diagnosed with STEMI.

Early detection and management of cardiovascular risk factors remain critical to improve women's cardiovascular health and reduce early mortality. There is now a prevalence of risk factors in men and a marked increase in risk factors in women compared to previous years. In addition, there is increasing evidence that biological differences may affect the clinical expression of cardiovascular risk factors, which may result in a greater likelihood of future cardiovascular disease in women compared to men.¹⁵

Hypertension, type 2 diabetes mellitus and smoking are very strong risk factors for myocardial ischaemia in women, whereas in men, smoking and diabetes confer a 45% and 25% higher cardiovascular risk in women than in men, respectively.¹⁶

Puig¹⁷ found that 85.1% had an electrocardiogram before arrival at the reperfusion centre and only 59.0% had an electrocardiogram at the reperfusion centre. This author states that the electrocardiogram is very important as it classifies as an infarction with or without ST-segment elevation and allows guidance as to conduct.

Garcés,¹⁸ a study on this subject, reports that 67.4 % of patients underwent reperfusion therapy, 25.5 % of which were pre-hospital and 51.9% of which were in-hospital.

Pre-hospital thrombolysis is effective and can be safely performed in Municipal Intensive Care Units, especially if the expected time of arrival at the hospital is more than 30 minutes, less than two hours after the onset of symptoms, and in the absence of clear contraindications.¹⁹

The STEMI management guidelines recommend primary PCI as the treatment of choice whenever it can be performed early, but maintain the indication for thrombolytic therapy when the time between first medical contact and balloon inflation is expected to be >90 min in the case of the American guidelines, or 120 min (90 min in patients with less than 2h of symptom evolution, extensive infarction and low bleeding risk) in the European guidelines. Apart from cases in which the first care is provided in or near a tertiary hospital, compliance with these requirements requires a highly efficient regional system for infarct care and patient transport, which is why thrombolytic treatment is still indicated in our setting for a large proportion of patients with STEMI.²⁰

Castillo²¹ in his study showed that 85.4% were discharged alive and 14.6% died, with treatment with aspirin and statins predominating in all those discharged alive.

Soto et al.,²² included 324 patients, of which 64.20% were men with a mean age of 65.8 years. The most frequent history was arterial hypertension, in 56%, and dyslipidemia, in 44%. The clinical presentation of the infarction was mainly without ST segment elevation, in 62%. 81% had a clinical presentation of type I infarction. The majority presented with Killip-Kimball class I (85%), and 4% in cardiogenic shock. Almost all received aspirin in the first 24 hours of hospitalization (99%).

Delgado et al.,²³ assessed the quality of medical care of patients with acute myocardial infarction admitted to a Hospital in Cienfuegos, Cuba. Where males predominated, the most frequent risk factors were hypertension (50%), smoking (45%) and diabetes mellitus (25%). There were difficulties in the use of beta-blockers and aspirin in prehospital care, especially in patients with non-ST elevation acute coronary syndrome. Arrival at medical services was early and there was a greater opportunity for thrombolysis. There were no deaths.

Conclusion

The patients admitted for acute myocardial infarction to the Coronary Care Unit were characterised according to sex at the Camilo Cienfuegos Provincial General Hospital in Sancti Spiritus during the period in question. It was found that most patients were between 50 and 59 years of age, were male, had arterial hypertension, functional class II and good adherence to treatment.

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None.

Conflicts of interest

The authors have no conflicts of interest in relation to the research presented.

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