

# Profile of patients with acute myocardial infarction in an emergency room of the federal district

**RESUMO** | Objetivo: identificar o perfil sociodemográfico, epidemiológico, clínico e os desfechos dos pacientes com infarto agudo do miocárdio em um pronto socorro. Método: estudo descritivo, transversal, quantitativo, realizado através de dados secundários de pacientes infartados. Resultados: a idade predominante foi entre 50-59 anos, sendo em sua maioria homens, pardos, casados. Foram acometidos com infarto com Supradesnivelamento de ST, apresentando precordialgia, sendo hipertensos, diabéticos, com sobrepeso/obesidade além de histórico de tabagismo. Os infartados apresentaram quadro hipertensivo na admissão, e durante a internação necessitaram de drogas vasoativas e suporte de oxigênio. O principal tratamento utilizado foi uso de fibrinolíticos, tendo como desfecho a transferência para hospitais cardiológicos. Conclusão: Há necessidade de aprimorar e intensificar a prevenção de fatores de riscos, elaborar protocolos e dispor de recursos capazes de proporcionar um atendimento adequado.

**Descritores:** Infarto do Miocárdio; Fatores de Risco; Serviço Hospitalar de Emergência.

**ABSTRACT** | Objective: to identify the sociodemographic, epidemiological, clinical profile and outcomes of patients with acute myocardial infarction in an emergency department. Method: descriptive, cross-sectional, quantitative study carried out using secondary data from infarcted patients. Results: the predominant age was between 50-59 years, being mostly men, brown, married. They were affected with infarction with ST elevation, presenting chest pain, being hypertensive, diabetic, overweight/obese, in addition to a history of smoking. The infarcted patients presented with hypertension on admission, and during hospitalization they required vasoactive drugs and oxygen support. The main treatment used was the use of fibrinolytics, with the outcome being transfer to cardiology hospitals. Conclusion: There is a need to improve and intensify the prevention of risk factors, develop protocols and have resources capable of providing adequate care.

**Keywords:** Myocardial Infarction; Risk factors; Emergency Hospital Service.

**RESUMEN** | Objetivo: identificar el perfil sociodemográfico, epidemiológico, clínico y evolución de los pacientes con infarto agudo de miocardio en un servicio de urgencias. Método: estudio descriptivo, transversal, cuantitativo, realizado con datos secundarios de pacientes infartados. Resultados: la edad predominante fue entre 50-59 años, siendo en su mayoría hombres, morenos, casados. Se encontraban afectados de infarto con elevación del segmento ST, presentaban dolor torácico, eran hipertensos, diabéticos, con sobrepeso/obesidad, además de antecedentes de tabaquismo. Los pacientes infartados presentaban hipertensión arterial al ingreso y durante la hospitalización requirieron fármacos vasoactivos y soporte de oxígeno. El principal tratamiento utilizado fue el uso de fibrinolíticos, con resultado de traslado a hospitales de cardiología. Conclusión: Existe la necesidad de mejorar e intensificar la prevención de los factores de riesgo, desarrollar protocolos y contar con recursos capaces de brindar una atención adecuada.

**Palabras claves:** Infarto de Miocardio; Factores de riesgo; Servicio de Urgencias Hospitalarias.

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## INTRODUCTION

Cardiovascular Diseases (CVD) are one of the leading causes of morbidity and mortality worldwide, accounting for more than 15% of deaths, according to the World Health Organization in 2020. <sup>(1)</sup> In Brazil, the prevalence corresponds to 26.9% of all deaths. <sup>(2)</sup> In view of this, it is worth emphasizing that ischemic heart diseases stand out among the CVDs, since they caused 117,549 deaths in 2019 alone, representing 32% of deaths from circulatory diseases, according to the Department of Informatics of the Unified Health System. <sup>(2)</sup>

Among the ischemic coronary diseases, Acute Myocardial Infarction (AMI) is the main one, having great relevance for public health. According to the European Society of Cardiology, AMI is defined as an injury evidenced by an increase in serum troponin by at least one value above the 99th percentile and/or a decrease with a suggestive curve, associated with clinical evidence of ischemia. <sup>(3)</sup> It is a chronic-degenerative disease, related to increased exposure to risk factors, which can be modifiable (smoking, dyslipidemia, systemic arterial hypertension (SAH), diabetes mellitus (DM), physical inactivity and obesity) or non-modifiable (age, sex, race, family history). <sup>(4)</sup> In addition, it causes consequences such as invasive treatments, overcrowding of emergency rooms and prolonged hospital stay. <sup>(4)</sup> It is also noted that there is an extremely significant impact on public health spending, given that the AMI had an estimated financial cost of R\$ 22.4 billion in Brazil in 2015. <sup>(5)</sup>

Therefore, it is necessary to identify the profile of infarcted patients in the emergency unit, which is essential for the promotion of public policies, adequacy of resources, but also to expand knowledge about this pathology, improving the management of this patient, as well as the creation of protocols.

Thus, this research aimed to identify the sociodemographic, epidemiological, clinical profile and outcomes of patients

with acute myocardial infarction in an emergency room.

## METHOD

It is a descriptive study with a cross-sectional design and a quantitative approach. It was performed in the emergency room of the public hospital in the administrative region of Ceilândia, located in the Federal District. Data collection was carried out through the red room admissions book, and the electronic medical records of patients who were admitted with a diagnosis of AMI between June 4th and December 31st, 2019 were analyzed.

Patients aged over 18 years and who presented AMI as a diagnostic hypothesis during admission were included in the research, as well as its confirmation through the medical records through the ECG recording and increase in cardiac markers, within the analyzed period. Patients with medical records that were not located and/or with unavailable information were excluded from the study.

The research instrument used was created after reviewing the literature and analyzing studies following the same theme. <sup>(3,6-7)</sup> It addresses sociodemographic data (age, sex, race, marital status, place of residence, means of entry); clinical condition (medical diagnosis, symptoms, comorbidities and lifestyle habits, clinical presentation according to vital signs at admission, use of vasoactive drugs and oxygen support during hospitalization, and treatment); outcome (transfer, discharge, evasion and death). The data were organized in the Microsoft Office Excel® 2016 program, using descriptive statistical analysis, and the results were made using tables.

The project was approved by the Research Ethics Committee of the Fundação de Ensino e Pesquisa em Ciências da Saúde, under protocol number 4,662,786. The methodological processes of this study were elaborated within the Resolution nº 466/2012 of the National Health Coun-



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cil. The waiver of the Free and Informed Consent Term was requested, due to the use of retrospective secondary data.

**RESULTS**

59 AMI suspects were identified. When analyzing the charts, 9 patients did not have a diagnosis of AMI and 4 charts were not located, thus comprising a total sample of 46 patients who had a confirmed diagnosis.

Patients were between 38 and 100 years old, with a mean age of 60.2 years and a standard deviation of 13.8 years. The predominant age group was patients aged 50-59 years (24%), as shown in table 1.

The research sample had a prevalence of men (54%), brown (28%), married (33%) and residing in the same administrative region as the hospital, in Ceilândia-DF (65%), as shown in Table 2.

Regarding the means of entry, patients were admitted through mobile Pre-Hospital Care (APH) teams (43%), mainly the Mobile Emergency Care Service (SAMU), followed by the Military Fire Brigade (CBM), and by spontaneous search (17%). It is worth mentioning the lack of information regarding color, marital status and means of entry, with no records in 52%, 41% and 17% respectively.

Regarding the characterization of myocardial infarction, there was a prevalence of AMI with ST-segment elevation (STEMI) in 65% of the cases. Chest pain was the most reported symptom (92%), especially with irradiation to the left upper limb and back (24 and 22% respectively). Other symptoms highlighted are sweating that represented 30% of the sample, nausea/vomiting and dyspnea with a percentage of 26% each.

Regarding comorbidities and life habits, we highlight SAH (74%), DM and smoking (35% in both), dyslipidemia (22%) and overweight/obesity (35%). A history of CVD occurred in 37% of the patients, with previous AMI being the most frequent cause (13%).

With regard to clinical manifestations,

**Table 1. Distribution of infarcted patients by sex and age. Brasília - DF, Brazil, 2021.**

Gender	<40 years		40-49 years		50-59 years		60-69 years		70-79 years		>80 years	
	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%
Female	0	0	6	13	3	6	5	11	5	11	2	4
Male	2	4	4	9	8	17	5	11	4	9	2	4
Total	2	4	10	22	11	24	10	22	9	20	4	9

Source: the authors, 2021.

**Table 2. Sociodemographic characterization of infarcted patients. Brasília - DF, Brazil, 2021.**

Variables	(n)	%
<b>Gender</b>		
Female	21	46
Male	25	54
<b>Race/Color</b>		
Black	3	7
White	4	9
Brown	13	28
Others	2	4
Not declared	24	52
<b>Marital status</b>		
Single	7	15
Married	15	33
Others	5	11
Unknown	19	41
<b>Place of residence</b>		
Ceilândia-DF	30	65
Other administrative regions	13	28
Goiás	3	7

Source: the authors, 2021.

these patients arrived at the emergency room hypertensive (48%), normocardiac (54%), with oximetry >94% (76%). Most patients required hemodynamic and respiratory support (52% in both). The medications administered to control hemodynamics include nitroglycerin (33%), noradrenaline (22%) and dopamine (11%). Regarding oxygen supplies, the nasal catheter (37%) followed by endotracheal intubation (24%) were the most

used.

The most frequent treatment was chemical reperfusion therapy with fibrinolytics (52%), followed by cardiac catheterization (39%) and angioplasty (26%). Only 17% of patients had only clinical/drug treatment for Coronary Syndromes. Regarding the outcomes, 48% of the patients were transferred to hospitals with intensive cardiac support, 32% were discharged with outpatient follow-up, 15%

died and 4% evaded the hospital.

**DISCUSSION**

AMI was more frequent in the 50-59 age group, in contradiction to data from DATASUS and recent national and international surveys that show a predominance between 60-69 years, demonstrating a trend of infarctions in younger patients. (6,8-9) As for the average age of 60 years, the same is presented in previously published studies. (9-10)

Regarding gender, men are more affected by heart attacks. (4,8,11-12) The cultural issue of gender resistance in not seeking early care, in addition to the low dissemination of health programs aimed at men and reduced search for preventive care, influence this data. (11-12) Regarding marital status and ethnicity, the data are similar to those already researched in that they show a prevalence of married and brown individuals. (6,8,10-11,13)

When analyzing the age group by gender, it is noted that most female infarcted patients are over 60 years of age, while men are mostly younger. The justification for elderly women to present an increased risk for AMI is related to the hormone estradiol, which inhibits adipose tissue before climacteric, protecting against CVD. (7,10,13-14) On the other hand, the occurrence of infarctions in younger men is influenced by factors previously described. (4,12)

As for the clinical diagnosis, there was a predominance of STEMI (65%), in line with recent research. (6,9-10,15) Chest pain is the most reported symptom, evenly distributed without irradiation or with irradiation. A survey carried out in a hospital in the state of Goiás, presented similar data, in which 98% of the patients had chest pain, with irradiation to the left upper limb and the symptoms of sweating, nausea/vomiting and dyspnea were highlighted. (10)

When analyzing comorbidities and life habits, SAH, DM, dyslipidemia, overweight/obesity, smoking present results

similar to those found in Brazil. (6,8,10,13) Internationally, the data found show a discrepancy in relation to SAH and smoking, since abroad there are fewer hypertensive patients (43%), while smoking has higher rates (62%). (9) It is noted that men, as the main sex affected by AMI, have more inadequate lifestyle habits, in addition to a

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high rate of involvement by diseases such as SAH and DM. (12) Hypertension is highlighted, 70% of patients had this comorbidity, this data demonstrates weaknesses in public policies aimed at promotion and prevention. (4) This disease is responsible for triggering vascular changes, such as increased stif-

ness, endothelial dysfunction and atherosclerosis, increasing the chances of developing AMI. (16)

Overweight or obesity was found in 35% of the medical records, it is worth noting that about 33% of the medical records did not include the Body Mass Index (BMI), this shows that more than half of the patients who presented this data in their medical records had a high BMI. This index is the most used in emergency units because it is easy to measure, but it is subject to limitations, not providing data on the distribution of visceral fat, a dependent factor for heart disease to occur. (7,17)

Regarding the history of CVD, 37% of the patients had these diseases, and 13% had a previous report of AMI. The justification as a risk factor is linked to cardiac remodeling after ischemia, in addition to population aging with a consequent increase in risk factors, with the expectation of new episodes of CVD such as AMI. (7) As for the lifestyle, 35% of the infarcted were active smokers or former smokers, surveys carried out in Brazil show similar percentages. (6,8,10,13)

The clinical presentation during admission shows that the majority had SAH, justified by the patients' previous diagnosis, and by the cardiac alteration generated by the AMI. (18) Heart rate within limits and saturation above 94%, shows a lower level of severity in the first hospital care, these data were in a research related to high mortality. (19)

During hospitalization, patients showed worsening/persistence of the anginal picture and hemodynamics, using mainly nitroglycerin, followed by noradrenaline and dobutamine as vasoactive drugs. Patients who maintain chest pain after treatment with oral nitrate, with normotension or hypertension, need treatment with intravenous nitroglycerin as recommended by the Brazilian and European Society of Cardiology. (3,7) In hypotensive patients, the change in blood pressure is related to decreased cardiac output and cardiogenic shock, requiring the use of



vasopressor and/or inotropic agents, in this case, noradrenaline was highlighted, although dobutamine is indicated as the preferred medication, being its use alone or together with noradrenaline and/or dopamine.<sup>(3,7)</sup>

During hospitalization, a high number of patients required ventilatory support, the main oxygen devices used were the spectacle-type nasal catheter and the endotracheal tube. According to current guidelines, infarcted patients may have fluid accumulation in the interstitium and in the pulmonary alveoli and alterations in the ventilation-perfusion ratio. In more severe cases, in which hypoxemia occurs, patients should receive supplemental oxygen through a nasal catheter or oxygen mask, and even then, when the condition continues to progress, it becomes necessary to use positive pressure or ventilatory support through orotracheal intubation.<sup>(7)</sup>

Regarding treatment, 17% had only clinical treatment with measures for Coronary Syndrome, which differs from the results already analyzed, which indicate a percentage higher than 40%.<sup>(11)</sup> The use of fibrinolytics was the main treatment, showing a higher prevalence compared to other studies, being related to the unavailability of hemodynamic resources that allow the early performance of primary percutaneous coronary intervention, time of onset of symptoms, absence of absolute contraindication factors and availability of medication.<sup>(6,11,17)</sup> Among the patients who underwent angioplasty,

none performed the procedure primarily, that is, within 12 hours of the onset of symptoms and without previous use of fibrinolytics, fact that would justify such a condition would be the lack of hemodynamic services, overcrowding of health services.<sup>(20)</sup>

It is important to emphasize that the precariousness of the emergency service is also related to the diagnosis. In the survey of patients admitted to the emergency department under study, 9 patients were not diagnosed with AMI due to the absence of an ECG and the unavailability of cardiac enzyme markers at the time of admission. This data raises concern, since these elements are indispensable for the investigation of infarction, thus revealing the insufficiency of care in its entirety.

The highest outcome obtained during hospitalization in the hospital studied was transference to the ICU of hospitals with cardiological support, since the hospital in this research does not have this type of service, therefore, patients need to be transferred for appropriate treatment in severe cases or for those who have an indication for percutaneous or surgical treatment.

The mortality rate was the same as that found in studies carried out in Minas Gerais, Paraná and Goiás (10% to 15%).<sup>(6,11)</sup> It is worth noting that the outcome of patients was only monitored while they were inside the study hospital, this number may be higher due to the percentage of patients who were referred to specialized hospitals.

The study has limitations regarding the small number of the sample and the generalization of the findings due to the fact that the research was carried out in a single hospital, in addition to the lack of information in the medical records. We suggest large-scale and prospective studies for a broad assessment.

## CONCLUSION

The profile of infarcted patients was male, between 50-59 years old, brown, married. They were affected with STEMI, presenting chest pain, having SAH, DM, overweight/obesity as comorbidities and smoking as a life habit. The clinical condition presented reveals patients with hypertension, who required vasoactive drugs and oxygen therapy during hospitalization. The main treatment used was the use of fibrinolytics, the most common outcome being transfer to hospitals with intensive cardiac support.

Despite the numerous proposals and projects developed to reduce infarction-related comorbidities, there is still a high presence of risk factors when compared to developed countries. There is a need to improve and intensify preventive measures in relation to CVDs and their risk factors, develop care protocols, train teams, have physical and material resources to provide rapid care with adequate treatment, improve prognosis and reduce hospitalization, mortality and financial costs.

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