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Incidence of acute myocardial infarction in elderly people in northern Minas Gerais, From 2008 to 2018

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ABSTRACT

Introduction: Cardiovascular diseases, including acute myocardial infarction (AMI), represent an important public health problem in Brazil and worldwide, increasing incidence and mortality rates, especially among an elderly population. AMI is a condition resulting from coronary artery obstruction, leading to a clinical imbalance between oxygen supply and consumption, due to insufficient flow to the myocardium, which can lead to the death of cells in the cardiac tissue. Methodology: Epidemiological, descriptive, cross-sectional, and quantitative study, carried out through documentary research at DATASUS and the Hospital Information System (SIH / SUS) with data collection in September 2018. Included tabulation and analysis of data related to care emergency room due to AMI in the elderly in the north of Minas Gerais between 2008 and 2018. Results/Discussion: Acute myocardial infarction contributes considerably to the increase in the number of deaths, especially in the elderly population. In the North of Minas, Montes Claros / Bocaiúva, there was a higher prevalence of hospitalizations, 82.3% of the total. The private service represents many hospitalizations and the number of deaths from heart attacks has been decreasing in a way decreasing in he last two years, of the study, in the north of mines. Conclusion: Therefore, with the dedication of a multidisciplinary team, it is possible to develop resources that lead patients to take an active attitude towards their disease, knowing and controlling the risk factors present in their lifestyle.

Keywords: Infarction, Cardiovascular diseases, Seniors, Morbidity, Mortality.

1 INTRODUCTION

Cardiovascular diseases, including acute myocardial infarction (AMI), represent an important public health problem in Brazil and worldwide, with high incidence and mortality rates. This reality can be explained both by the change in the age structure of the population, as well as by the increased prevalence of exposure to risk factors known to be associated with diseases of the circulatory system, such as sedentary lifestyle, increased consumption of meat and fats, reduced consumption of fruits and vegetables, consumption of alcoholic beverages, smoking and increased prevalence of obesity [(1).]

Among the cardiovascular diseases, the one with the highest incidence is coronary artery disease (CAD) whose main clinical manifestations are angina *pectoris*, acute myocardial infarction (AMI) and sudden death [(2)]. AMI is a clinical condition resulting from the obstruction of the coronary artery, leading to an imbalance between the supply and consumption of oxygen, due to insufficient flow to the myocardium, which can lead to the death of cardiac tissue cells [(3).]

In Montes Claros, the largest health macro-region in the north of Minas Gerais, we noticed an increase in the incidence of acute myocardial infarction with age, with a higher prevalence in the population aged 60 to 69 years, as shown in the figure below.

This fact is explained by the higher risk of cardiovascular involvement in the elderly since the process of atherosclerosis (formation of fatty plaques in the wall of the arteries of the heart) is chronic and degenerative. In addition, poor diet and regular physical inactivity make AMI more exuberant in elderly patients [(4).]

In this sense, the objective of the present study was to analyze the prevalence and mortality rate of AMI in the elderly population of northern Minas Gerais, in the period from 2008 to 2018, using data from the Department of Informatics of the Unified Health System (DATASUS).

2 METHODOLOGY

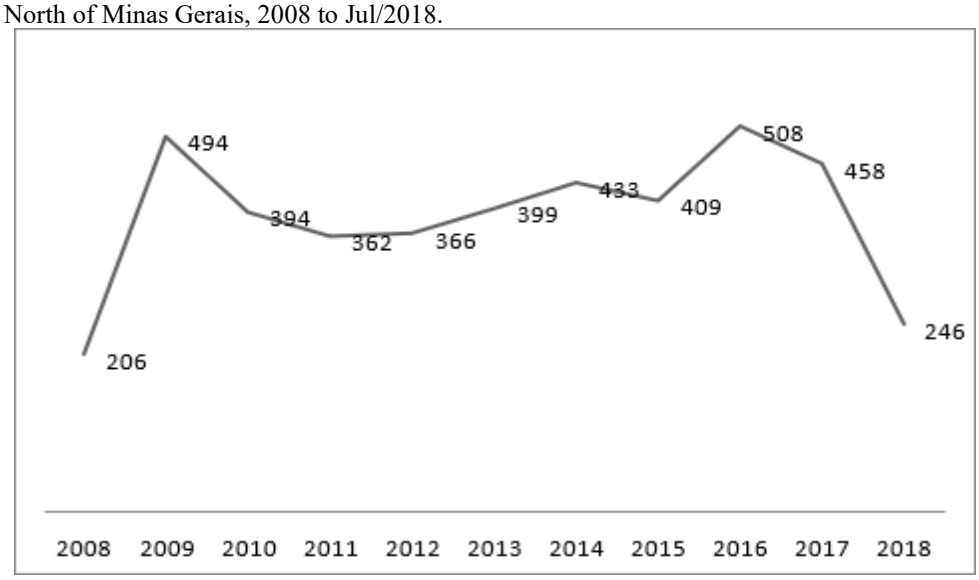
This was a cross-sectional descriptive epidemiological study with a quantitative approach. The data collection technique used was a documentary query in the DATASUS database, which contains health information systems available on the Internet on the http://www.datasus.gov.br website. The data on hospital morbidity of the Unified Health System (SUS) by place of hospitalization for Acute Myocardial Infarction (AMI) in the elderly in the emergency services originated from the Hospital Information System (SIH/SUS), which uses as an instrument the Hospital Admission Authorization (AIH) form. Data collection took place in September 2018 through the use of the TABNET program. The study population consisted of all cases of AMI in the elderly treated in an emergency room in the northern region of Minas Gerais from 2008 to 2018. The tabulation of the SIH/SUS records for the research included the following variables: age, sex, year of hospitalization, health macro-region of the state of Minas Gerais and the North of Minas Gerais, cities of the North of Minas Gerais and deaths. The data were organized in Microsoft Excel® spreadsheets and underwent descriptive statistical treatment, calculating the prevalence, mortality rate and number of hospitalizations for AMI and presented in the form of graphs. Considering that the research was based on data made available electronically by the Ministry of Health, which are in the public domain and, because there is secrecy about the identification information inherent to the human beings involved, this study does not require the appreciation and approval by the Research Ethics Committee.

3 FINDINGS

From January 2008 to July 2018, 4783 elderly people were hospitalized due to Acute Myocardial Infarction (AMI) in the North of Minas Gerais. In this period, the values found ranged from 206 to 508 cases per year, with a predominance of hundreds of 300 and 400, as shown in Figure 1. From 2008 to 2009 there was an increase of 239.8%. The figure makes a downward curve from the

year 2009 to 2011 that represented the lowest percentage of notifications 7.6% of the total, with a subsequent increase of 119% in the number of hospitalizations until 2014, when there was again a reduction to 409 annual cases. The year 2016, presented the highest percentage of notified cases 13.1%, from this year the number of cases decreased 52.6% until 2018.

Figure 01: Number of hospitalizations for Acute Myocardial Infarction according to the second year of care in emergency services in the North of Minas Gerais, 2008 to Jul/2018.



Source: Ministry of Health - Hospital Information System of the SUS (SIH/SUS)

When the cases are divided according to the city of hospitalization, a higher prevalence of hospitalizations is observed in the cities of Montes Claros and Bocaiúva, with 82.3% of the total and lower values in the cities of Francisco Sá and Coração de Jesus, with 0.25% and 0.32% of the total, respectively. According to Figure 2, the number of hospitalizations due to AMI in the cities of Montes Claros and Bocaiúva exceeds by hundreds the number of annual cases in all other regional municipalities.

Figure 02: Absolute number of hospitalizations for Acute Myocardial Infarction according to year of care and city of North of Minas, 2008 to Jul/2018.

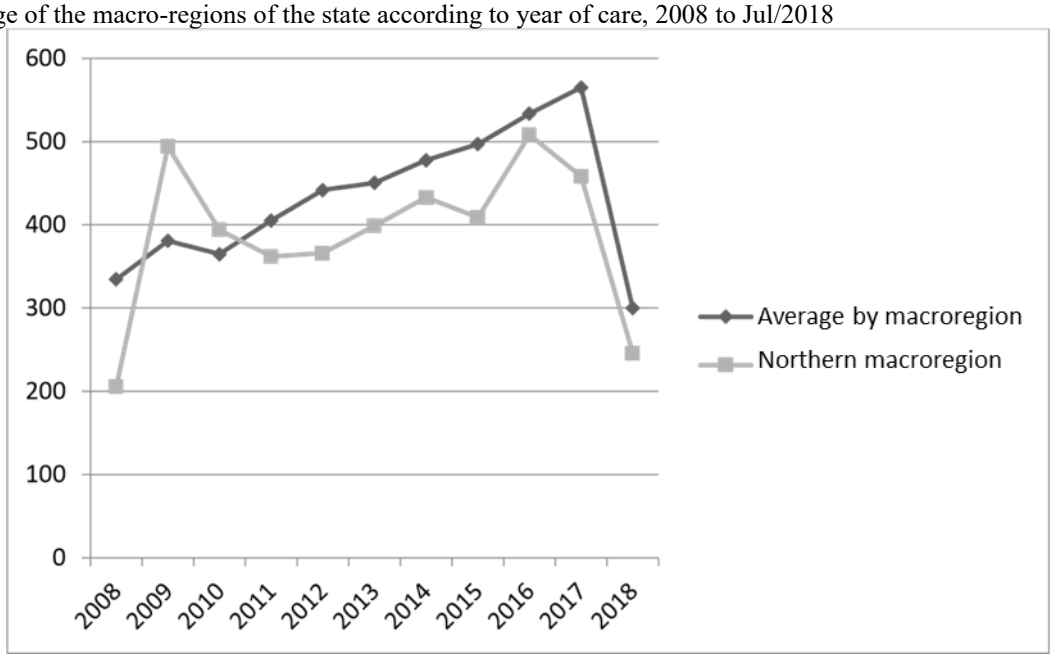
Year processing	BAM/SAF	COJ	FRS	JOHN/MAZ	JAR	ONE	POWER/BOC	PIR	SAL/OR
2008	9	1	1	14	6	4	149	-	22
2009	7	2	1	4	5	10	437	3	25
2010	7	1	-	3	3	10	336	8	26
2011	9	2	-	9	3	10	287	2	40
2012	16	-	-	14	4	19	277	2	34
2013	2	2	1	6	1	24	319	3	41
2014	9	1	3	12	1	3	359	3	42
2015	10	-	-	12	-	5	349	4	29
2016	14	1	2	11	-	8	424	6	42
2017	13	3	2	12	4	8	374	4	38

2018	12	1	1	2	-	9	251	1	20
Total	108	14	11	99	27	110	3562	36	359

Legend: BAM/SAF (Brasília de Minas/São Francisco), COJ (Coração de Jesus), FRS (Francisco Sá), JAN/MAZ (Janaúba/Monte Azul), MOC/BO (Montes Claros/Bocaiuva), SAL/TAI (Salinas/Taiobeiras), JAR (Januária), PIR (Pirapora)
Source: Ministry of Health - Hospital Information System of the SUS (SIH/SUS

In comparison with the average of other state macro-regions, as shown in Figure 3, the north of Minas Gerais presented oscillating values, with a tendency to increase, in the number of annual hospitalizations, while the average of the other macro-regions always presented values higher than the immediately previous year. Excluding the years 2009 and 2010, the number of cases registered in the northern macro-region was lower than the state average during the decade surveyed.

Figure 3: Relationship of the average prevalence of hospitalizations for Acute Myocardial Infarction North of Minas Gerais and average of the macro-regions of the state according to year of care, 2008 to Jul/2018



Source: Ministry of Health - Hospital Information System of the SUS (SIH/SUS)

According to the sociodemographic data of the Hospital Information System of the SUS (SIH/SUS), it was observed that most of the cases were mostly distributed between 60 and 69 years, with 1902 cases (43.96%), and in patients aged between 70 and 79 years there are a total of 1557 cases (36.45%) and in patients over 80 years there are 867 cases (20.04%) registered in the period analyzed. In relation to the most affected sex, there is a higher prevalence of AMI in men (57.2%).

Regarding the number of hospitalizations by hospitalization, in 8.35% were in public hospitals and in 91.6% of the cases were in private hospitals. The average number of hospitalizations in the public sector was approximately 94 cases and for the private sector it was 27 cases.

In relation to the average length of stay according to the public or private regime, there is a general average of 6 days in the public sector and 5 days in the private sector. The region that obtained the highest means of permanence were Montes Claros/Bocaiúva

(8.3 days in the private sector) and Pirapora (4 days in the public sector). The smallest were in the regions of Francisco Sá (2.8 days in the public sector) and Salinas (2 days in the private sector) (Table 1).

Table 01: Sociodemographic and clinical data of hospitalizations for Acute Myocardial Infarction in an emergency regime in the North of Minas Gerais from 2008 to Jul/2018.

BAM/SAF		COJ	FRS	JAN/MAZ	JAR	ONE	POWER/BO	PIR	SAL/OR
AGE GROUP	34	7	2	33	9	54	1613	11	139
60-69 years	36	5	6	25	10	36	1293	18	128
70-79 years	38	2	3	41	8	20	656	7	92
80 years and over									
GENDER **Male Female**	52 56	8 6	3 8	53 46	16 11	53 57	2050 1512	23 13	218 141
REGIMENT **Public-Private** **Ignored**	68 - 40	9 - 5	- 6 5	20 53 26	23 - 4	- 84 26	14 2438 1110	1 22 13	115 141 103
PERMANENCE **Public-Private**	2,8 -	3,2 -	- 5,7	2,8 3	2,3 -	- 2,6	1,1 8,3	4 3,5	2 3
EXPENSE **Public-Private** **Ignored**	56969 - 31459	3766 - 1858	- 3405 3198	17307 28677 18691	9326 - 2510	- 39979 15023	6415,41 13484165 7130616	541,5 36427 10220	63791,04 186654,2 77158,48

Legend: BAM/SAF (Brasília de Minas/São Francisco), COJ (Coração de Jesus), FRS (Francisco Sá), JAN/MAZ (Janaúba/Monte Azul), MOC/BO (Montes Claros/Bocaiuva), SAL/TAI (Salinas/Taiobeiras), JAR (Januária), PIR (Pirapora), MAN (Manga).
Source: Hospital Information System of SUS – SIH/SUS

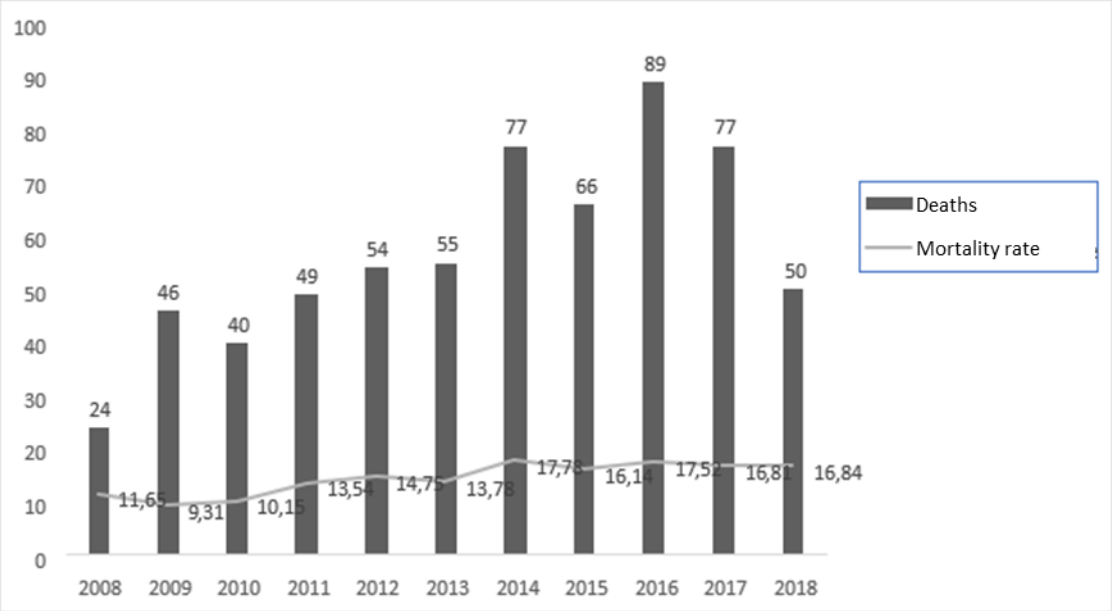
Private expenses (paid by health plans or by the patient's family) reached R$ 13,779,307.20 at the end of the decade studied and were more than 80 times higher than public expenditures, which totaled R$ 158,115.95, although the prevalence of public and private care varied according to the municipality. The municipalities of Brasília de Minas and São Francisco, Coração de Jesus and Januária presented predominantly public hospitalization and absence of private hospitalization.

The number of deaths of patients affected by AMI, whether hospitalized or not, ranged from 24 to 89 annual cases, with a total of 627 deaths in the period from 2008 to July 2018. The year 2008 presented the lowest number of deaths, suggesting a certain control in the mortality of the disease. However, between 2013 and 2017 there was an increase in the frequency of deaths.

The average mortality rate due to acute myocardial infarction in emergency services in the North of Minas Gerais in the period evaluated ranged from 11.5%, a value found in 2008, to 17.78%, a value found in 2014. Although the year 2016 had the highest number of deaths, and 2017 having the

same number of deaths, the mortality rates of these years were 17.52% and 16.81% which still shows a more favorable result to the affected patients. The other results are shown in Figure 4.

Figure 4: Number of deaths and mortality rate from Acute Myocardial Infarction according to year of care in emergency services in the North of Minas Gerais, 2008 to Jul/2018.



Source: Ministry of Health - Hospital Information System of the SUS (SIH/SUS)

4 DISCUSSION

Among the cardiovascular problems, severe episodes that affect the elderly, we highlight the Acute Myocardial Infarction (AMI), which contributes considerably to the increase in the number of deaths, the AMI results from myocardial necrosis by severe ischemia, resulting in rupture of a fat plaque, forming a thrombus that occludes and prevents the coronary artery blood flow [(5)].

The year 2016 represented the year with the highest number of hospitalizations due to AMI

(508) in the north of Minas Gerais diverging with those of Brazil, which had a higher number of hospitalizations in 2017. However, in the North of Minas Gerais and in Brazil, the year with the fewest hospitalizations was in 2008.

As for the regions of the North of Minas, Montes Claros/Bocaiúva, presented a higher prevalence of hospitalizations, 82.3% of the total. This fact can be explained by the size of the population of the cities, number of hospitals and health professionals.

Regarding the hospital regime used in hospitalizations, there is a considerable imbalance of data between the public and private regimes in the emergency services, because the private service represents most hospitalizations (91.6%), with Montes Claros/Bocaiúva being the region with the number of private hospitalizations, unlike cities such as Brasília de Minas/São Francisco where there were no hospitalizations in the private sector.

The World Health Organization (WHO) defines the elderly population as those over 60 years of age when it comes to developing countries. In the elderly under study, a higher frequency was observed between 60 and 69 years in the municipalities evaluated. Aging exerts four basic influences on cardiovascular diseases: it increases vulnerability, promotes heterogeneous and peculiar behaviors, imposes differentiated evaluation and recommends individualized interventions [6].

The number of deaths from infarction has been decreasing significantly in the last two years in the North of Minas, this is due to technological advances after the advent of coronary reperfusion therapies that consequently drastically decrease the number of in-hospital deaths, however the overall mortality rate (extra and in-hospital) has remained more stable, without significant reductions.

5 CONCLUSION

The population that has already suffered one or more cardiovascular events has a high prevalence of risk factors such as hypertension, smoking, sedentary lifestyle, obesity, among others, confirming the low level of information and the need for a specific educational program for this group.

With the dedication of a multidisciplinary team, it is possible to develop resources that lead patients to assume an active attitude towards their disease, knowing and controlling the risk factors present in their lifestyle. In any case, health education can only be a work instrument for health professionals if they know the population they are assisting so that they can take into account their particularities, their limitations and consequently the real needs, allowing the performance of the multidisciplinary team.

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