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ORIGINAL ARTICLE

PROFILE OF THE POPULATION AFFECTED BY ACUTE MYOCARDIAL INFARCTION

PERFIL DA POPULAÇÃO ACOMETIDA POR INFARTO AGUDO DO MIOCÁRDIO

EL PERFIL DE LA POBLACIÓN AFECTADA POR EL INFARTO AGUDO DE MIOCARDIO

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ABSTRACT

Objective: to characterize the profile of the population affected by acute infarction ***Method:*** descriptive study, retrospective, with documentary analysis and quantitative approach, conducted at the Emergency Unit of the General Hospital Prado Valadares de Jequié (BA), Brazil. The sample consisted of 106 medical records. The software Microsoft® Excel2010 was used for data analysis, and the results were organized in tables. ***Results:*** from the people affected by the infarction, 66% were men and 34%, women, with an average of 65.3 years old; 34% self-reported brown, 33% were married, 7.5% had no education, 47.2% had systemic arterial hypertension, and 31.2% were smokers. The mortality rate achieved 20.8%. ***Conclusion:*** one highlighted the arterial hypertension as the main factor for the acute infarction, besides enhancing a significant rate of hospital mortality, equally reported by other authors. ***Descriptors:*** Myocardial Infarction; Cardiovascular Diseases; Urgency; Mortality.

RESUMO

Objetivo: caracterizar o perfil da população acometida por infarto agudo. ***Método:*** estudo descritivo, retrospectivo, de análise documental, com abordagem quantitativa, realizada na unidade de Emergência do Hospital Geral Prado Valadares de Jequié (BA), Brasil. A amostra foi constituída de 106 prontuários. Utilizou-se o programa Microsoft® Excel2010 para análise de dados, apresentados em forma de tabelas. ***Resultados:*** 66% dos infartados eram do sexo masculino e 34% do sexo feminino, com média de 65,3 anos, sendo a predominância de 34% autodeclarados pardos, 33% casados, 7,5% apresentaram-se sem escolaridade, 47,2% tinham hipertensão arterial sistêmica e 31,2% eram fumantes. O índice de mortalidade chegou a 20,8%. ***Conclusão:*** evidenciou-se a hipertensão arterial como o fator de risco mais prevalente no evento do infarto agudo, além de evidenciar um índice expressivo de mortalidade hospitalar, demonstrado igualmente em outras literaturas. ***Descritores:*** infarto do miocárdio; doenças cardiovasculares; urgência; mortalidade.

RESUMEN

Objetivo: **c**aracterizar el perfil de la población afectada por el infarto agudo**.** ***Método:*** estudio descriptivo, retrospectivo, con análisis de documento y un enfoque cuantitativo, realizado en la Unidad de Urgencias del Hospital General Prado Valadares Jequié (BA), Brasil. La muestra consistió de 106 registros. El programa Microsoft® Excel2010 fué usado para el análisis de los datos, presentados en tablas. ***Resultados:*** 66% de infartado eran hombres y 34%, mujeres, con una edad media de 65,3 años, 34% marrones autodeclarados, 33% casadas, 7,5% sin escolaridad, 47,2% tenía hipertensión, y el 31,2% eran fumadores. La tasa de mortalidad alcanzó el 20,8%. ***Conclusión:*** se evidenció la hipertensión arterial como el factor principal de riesgo en el infarto agudo, y una tasa significativa de la mortalidad hospitalaria, también demostrado en otras literaturas. ***Descriptores:*** Infarto del Miocardio; Enfermedades Cardiovasculares; Urgencias; Mortalidad.

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INTRODUCTION

Cardiovascular diseases (CVD) are, among the chronic diseases, the main causes of death in both developed and developing countries.[1] The world epidemiological situation has been showing changes over the past years. Since the 1960s, the decline in infectious and parasitic diseases (IPD) and the increase in chronic non-communicable diseases (CNCD) have been significant, mainly the cardiovascular diseases, due to its large magnitude.[2]

According to the World Health Organization (WHO)[2], every year, 17.1 million of people die due to cardiovascular diseases. Among 20 millions of people affected by this disease, roughly 12 million are fatal victims of Acute Myocardial Infarction (AMI). Based on the recent patterns, the estimative for 2030 is that about 23 million of people die due to cardiovascular diseases in the world.[2] The mortality rate for this disease, in Brazil, is also considered extremely high and responsible for 6 to 10% of deaths, which means 300 to 400 thousands of yearly cases.[3] In Bahia, in 2011, this index affected 4.649 thousands of people.[4]

The term a*cute myocardial infarction* basically means the death of cardiomyocytes, caused by long-term ischemia. Generally, this ischemia is caused by thrombosis and/or vasospasm of an atherosclerotic plaque. Mostly, the thrombus develops over vulnerable plaques, inflamed, full of lipid and thin fibrous cap, and, at a small portion, is related to the erosion of that atherosclerotic plaque.[5]

The AMI is still one of the mains causes of morbidity, mortality and disability in the developed Western countries, representing a huge problem in public health worldwide.[6] Therefore, as it is a disease of great impact, it should be considered as an important indicator of policy quality standards in public health.

Epidemiological studies report mortality rates of AMI as roughly 30%; half of these deaths occur in the first two hours of the event, and 14% of patients die before receiving medical care.[7] A research shows that only 80% of the patients with acute chest pain look for the emergency department, due to the wrong interpretation and the lack of knowledge of the disease's symptoms, complicating the early diagnosis and treatment, and resulting in and increased incidence of complications and even deaths; these are the reasons for the study conduct at this sector.[8-9] Despite these numbers, the patients early attended by the hospital emergency service have been benefited from the therapeutic advances during the past decades.[6]

The following guiding question emerged from the exposed data: What is the profile of the patients affected by AMI in the General Hospital in the city of Jequié (BA)?

It is noteworthy the importance of providing, with this study, the profile of patients who suffered from AMI so that more incisive actions are used in the formulation of public policies to reduce the morbidity and mortality rates, through prevention and control of risk factors for this disease. Thus, the objective of this study is:

- To characterize the profile of the population affected by acute infarction.

METHOD

Descriptive study, retrospective, with documentary analysis and quantitative approach, conducted at the Emergency Unit of the General Hospital Prado Valadares (HGPV), one of the main reference hospitals of the inner Bahia State, attending roughly 30 cities and a population of 600 to 900 thousands habitants, located at the local health center in the city of Jequié (BA), Brazil.[11] The data were collected in August 2013, by the patients' medical records, stored in the Medical Record Service (SAME) sector of the respective hospital. From 2.424 registered hospitalizations in 2012, 106 were medical records of patients mainly diagnosed with AMI.

The variables were included in the study according to sociodemographic characters, such as: gender, age, marital status, education and city of residence; information about primary diseases – Systemic Arterial Hypertension (SAH) and *diabetes mellitus* (DM); information about life habits - smoking and alcohol consumption; and clinical findings - myocardial electrocardiogram, cardiac enzymes (creatine kinase MB (CK-MB), cardiac troponin T (TnTc) and cardiac troponin I (TnIc)) and cholesterol/triglycerides.

Some of the mentioned variables were absent or not clearly reported in the records; however, they were part of the study for its importance in MAI event. The obtained data were analyzed and presented in tables for consideration, and those not found in the medical records were mentioned in the study and classified as ignored variables.

The software Microsoft® Excel2010 was used to analyze the data and to organize the variables of the study in relative and absolute frequencies, mean and standard deviation of each category of variables.

Concerning the ethical and legal aspects, the study was in accordance with Resolution Nº 466/12 of the National Health Council - CNS and was submitted to the Research Ethics Committee of the State University of Southwestern Bahia (UESB) under Nº CAAE 15052613.2.0000.0055, being approved and released for data collecting.[12]

RESULTS

From the surveyed population of 106 medical records, 66% were men and 34%, women, with an average of 65.3 (±13.8), and 33.0% were married, according to Table 1.

Regarding education, and from the data present in the medical records, most of the individuals had no education (7.5%); as for the variable *self-reported skin color/race*, most of the patients were brown, representing 36 individuals (34%).

Table 1. Clinical, sociodemographic and mortality profile of the population diagnosed with Acute Myocardial Infarction at the General Hospital, in 2012. Jequié (BA), 2013.

Variables (n)	n	%
Female	36	34.0
Male	70	66.0
Gender (106)		
Education (106)		
No education	08	7.5
Until 8 years	05	4.7
More than 8 years	05	4.7
Blank	88	83.0
Marital situation (106)		
Single	26	24.5
Married	35	33.0
Divorced	01	0.9
Widow(er)	03	2.8
Blank	41	38.7
Race/Skin color(106)		
Brown	36	34.0
Negro	01	0.9
White	03	2.8
Blank	66	62.3
Hypertension/Diabetes (106)		
SAH	50	47.2
DM	04	3.8
SAH + DM	38	35.8
None	11	10.4
Ignored data	03	2.8
Hospital Release (106)		
Death	22	20.8
Transference	01	0.9
Better	83	78.3
Smoking/Alcohol consumption(106)		
Smoker	27	25.5
Alcoholic	2	1.9
Smo + Alc	6	5.7
None	4	3.8
Ignored data	67	63.2
ECG Diagnosis (106)[2]		
AMI without SST[3]	34	32.1
AMI with SST	72	67.9

1 Continuous variable as mean + standard deviation; 2 ECG: Electrocardiogram; 3 AMI: Acute Myocardial Infarction; SST: expressa como média + desvio padrão; 2ECG: Eletrocardiograma; 3 IAM: Infarto Agudo do Miocárdio; SST: Super-elevation of the ST segment..

Concerning the variables of co-morbities, the most representative one was AMI, with 50 individuals (47.2%), followed by DM, with 42 (39.6%). The averages of Arterial Pressure (Systolic – SP and Diastolic – DP) and glycemic values were, respectively, 155.4 (± 32.59), 92.63 (± 17.89) and 189.5 mg/dl (±113.23), considering the data collected at the moment of the hospitalization (Table 3).

In addition to these variables, the independent risk factors, such as smoking, were found in about 33 individuals (31.2%), with 27 only smokers (25.5%) and 6 smokers and alcoholics (5.7%). The alcohol consumption as reported in a sample of 8 individuals (7.6%).

The most obvious and incident diagnosis found in this research, from the Electrocardiogram examination (ECG) was the AMI with SST, with 72 individuals (67.9%).

Regarding the number of deaths, the prevalence was 20.8%. Table 2 show the origin of the patients attended with a primary diagnosis of AMI, whose cities of origin are attended by the HGPV. The city of Jequié-BA had the highest prevalence, with 63.8% of individuals.

Table 2. Cities of origin of the population diagnosed with Acute Myocardial Infraction, attended at the General Hospital Prado Valadares, in 2012. Jequié (BA), 2013.

City	n	%
Jequié	67	63.8
Itagiba	3	2.9
Brejões	1	1.0
Santa Inês	1	1.0
Ibirataia	2	1.9
Lafaiete Coutinho	1	1,0
Ipiaú	7	6.7
Itamari	1	1.0
Boa nova	1	1.0
Apuarema	2	1.9
Jitauna	6	5.7
Maracás	5	4.8
Nova Itarana	1	1.0
Itagi	3	2.9
Planaltino	2	1.9
Itaquara	2	1.9
Total	106	100.0

Regarding the length of stay of the patients victims of acute infarction, the average was 6.6 (±5.47) days of hospitalization.

Besides ECG, the biochemical markers *Isoenzime MB of creatine Kinase (CKMB), CKMB total* and *Troponin T* had the respective averages: 82.95 (+ 92.69), 914.84 (± 1203.62) and 760.59 (± 853.67).

Table 3. Laboratorial-clinical profile of the population diagnosed with Acute Myocardial Infarction, attended at the General Hospital Prado Valadares, in 2012. Jequié (BA), 2013.

Variables	MEAN (SD)
Days of hospitalization	6,6 + 5,47
Systolic presure	155,4 + 32,59
Diastolic pressure	92,63 + 17,89
Glycemia	189,5 + 113,23
CKMB[1]	82,95 + 92,69
CKMB_Total	914,84 + 1203,62
Troponin T	760,59 + 853,67

1 CKMB : isoenzime MB of creatine kinase.

DISCUSSION

The definition of a risk factor is any clinical or laboratory element associated with the probability of the disease to occur, along with its progression, during certain period of time. The association of risk factors observed between populations may not necessarily be

the same, because the atherosclerotic process is influenced by environmental factors and genetic susceptibility.[13]

In this study, the men were the most affected, confirming the data found by other authors.[14-5] An study conducted at the biggest emergency room of the southern country, where 152 patients with acute coronary syndrome (ACS) were assessed, reported that 67.6% of the cases were men, 32.4%, women, with an average of 61 years old (± 10.3).[14] Still concerning the gender, other study, conducted in Teresina – PI, showed no significant differences between men and women, although most of the surveyed individuals were men (56.2%).[15]

When evaluating the risk factors for AMI, the studies confirm that the level of education is inversely proportional to the disease.[13]

Among the analyzed variables, the self-reported race/skin color was the one different from other studies. The literature enhances White individuals as the most affected by the disease[16]; similar study found that white patients had AMI from eight to ten years more than negro patients.[17]

Regarding the co-morbidities, the arterial hypertension is the most frequency one, statistically similar to other studies about the prevalence of SAH in AMI[18]. A study conducted at the First Aind Station of the University Hospital in the city of Belo Horizonte/MG found this disease in seven (71%) patients who had suffered from infarction[19]. The limit values for hypertensive adults are definied by the systolic arterial pressure (SAP), between 130 and 139 mmHg, and by the diastolic arterial pressure (DAP), between 85 and 89 mmHg[20]. It is important to mention that this cronic co-morbidity represents one of the main risk factors for cardiovascular diseases, increasing from twice to three times the odds for AMI when comparing to individuals without it. [21]

Among the many factors that influence the course of SAH, the most important are those that change, for its high rate in the population and for being the main concern of public health policies.[22] These factors are influenced by the living conditions of the population and are expressed in their life actions, established inter-personal relationships and socio-cultural context they live in.[23]

The AMI occurs more than ten years earlier in smokers when compared to non-smokers, leading to a decrease in other risk factors related to the disease[3]. A research demonstrated that this disease affected 61 (40.1%) individuals, which is close to the findings of this study.[15]

In this study, the smoking was pointed out as the most important independent risk factor for AMI. Confirming this research, other analysis, conducted in Porto Alegre, evidenced the smoking as the prevailing risk factor (76.3%).[24]

Regarding the diagnosis, ECG is the most important examination to confirm AMI, and shall be ideally realized in less than ten minutes after the patient gets to the emergency, for it is the center of the initial decision process in patients with ischemia suspicion.[6,3] This study showed the AMI with SST as the most frequent one; nevertheless, a research in Porto Alegre reported more caes of AMI without SST, with 50.7% of the individuals.[14]

The mortality rate found in this study was consistent with a research conducted in Rio de Janeiro, with the objective of analyzing the profile and factors associated with hospital mortality in AMI hospitalizations in the city, where the rate was 20.6% in a stratified random sample of 391 records.[25]

It is noteworthy the significant data values ignored in the surveyed population of this research. Some variables were hampered due to incomplete information provided in the patient's record. The importance of filling properly this document helps both improvement of the care provided to the individual as planning actions in public health aimed at healthy eating, regular physical activity, leisure, social participation, and the quality of life of the entire population.

Still concerning the diagnosis and prognosis of patients, biochemical markers were used. These myocardial injury markers are intracellular macromolecules released after the injury of the sarcolemmal membrane of myocytes due to necrosis.[26,27]

The creatine kinase-MB (CK-MB) is an enzyme that catalyzes the formation of high energy molecules and found in tissues that consume it, like the cardiac and skeletal muscle, and nerve tissue. As for the cardiac troponins, these are proteins of the myofibrillar complex found only in heart muscle. They are highly sensitive, so minimum elevations are compatible with small (micro) infarcts, even with no increase of CK-MB.[28]

Thereby, it is necessary to transmit the knowledge about the risk factors, signals and symptoms of AMI in order to early diagnose it, for 40 to 60% of the deaths occur in the first hour, and roughly 80% in the first 24 hours.[29] The Brazilian Society of Cardiology highlights the importance of promoting actions in preventive health to the community and, by the health team, the development of policies

and programs that enable the health education at schools, churches, companies, sports associations, in order to reduce the mortality rate by AMI.[3,30]

CONCLUSION

The results of this research show SAH as the main risk factor for AMI, and a significant rate of hospital mortality in patients with definitive diagnosis, also shown in other studies. The major limitation of the study regarded the lack of complete data, enhancing the importance of correctly and completely filling the medical records, promoting the continuity and quality of care provided to patients by the multidisciplinary team.

Health promotion strategies are necessary to contribute for the change of people's living habits, including abandoning routines of poor nutrition, physical inactivity, obesity, stress of modern life, the use of illicit drugs, tobacco consumption and harmful use of alcohol. It is necessary to identify the profile that characterizes the population affected by AMI, as each person has his/her own limitations and characteristics, influenced by the environment where he/she lives, which contributes for the implementation of health policies directed to preventing risk factors and reducing the incidence of the disease in the city and region.

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