ORIGINAL ARTICLE

FACTORS ASSOCIATED TO THE HISTORY OF ACUTE MYOCARDIAL INFARCTION IN HYPERTENSIVE PRIMARY CARE USERS

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ABSTRACT | Objective: To investigate the factors associated to the history of acute myocardial infarction (AMI) in hypertensive patients attended at Primary Healthcare (PHC) units. **Methods:** A cross-sectional study was performed in a health district in the city of Salvador, Bahia, between May and September, 2013. Primary data was collected through trained interviewers. The magnitude of the association was estimated using the OR calculation, adopting the CI of 95%. Subsequently, multivariate analyses were carried out using logistic regression. The project was approved by CEP/UNEB (CAAE 09656012.0.0000.0057) and financed by PRO/PET-Saúde, 2012. **Results:** There were 297 hypertensive patients and, among these, 243 (81.3%) were of the female gender and had average age of 56 years (± 11.54). It was observed that 35 (11.8%) reported having suffered AMI. The risk factors associated the prior AMI were concomitant Diabetes Mellitus (DM) (OR=2.19; CI95% 1.03 – 4.68) and not being aware of the existence of health education groups (OR=5.31; CI95% 1.39 – 20.20); while the protection factors were absence of central obesity (OR=0.43; CI95% 0.20 – 0.95), taking part in health education groups (OR=0.19; CI95% 0.05 – 0.73) and having had an electrocardiogram during the past 06 months (OR= 0.37; CI95% 0.15 – 0,92). **Conclusion:** A high percentage of hypertensive patients with a background of AMI which was associated to the diagnosis of DM, central obesity, not having had periodic electrocardiograms and not having participated in health education groups. Strategies for the promotion of healthcare with the population and outpatient care may be considered as effective actions for the prevention of AMI.

Keywords: Hypertension; Myocardial infarction; Coronary Artery Disease; Health Education; Primary healthcare.

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INTRODUCTION

Cardiovascular diseases (CVD) are the leading cause of death in the world[1]. It is estimated that in 2015 they were responsible for approximately one-third of all deaths on the planet[1], a proportion similar to that found in Brazil[2]. Among CVDs, coronary artery disease (CAD) is the main cause of death, with acute myocardial infarction (AMI) being the predominant etiology[3]. In 2013 the CAD was responsible for about 107 thousand deaths in Brazil[2]. In 2015, 7.4 million died from this cause in the world[1].

Systemic Arterial Hypertension (SAH), one of the main risk factors for CVD mortality, is perpetuated as one of the most important public health problems in the country[4]. An overall prevalence of 31.0% is estimated in the Brazilian population, reaching 52.7% in individuals between 65 and 74 years of age and 55% in those aged 75 years or over[2]. Because it is often asymptomatic and the measurement of blood pressure (BP) is not routine in all health care, many diagnoses are made late. In addition treatment is usually neglected. Epidemiological studies have demonstrated blood pressure control rates ranging from 10.1% to 35.5%, although this measure is essential in the prevention of lesions in target organs[2].

In addition, one of the main pathological mechanisms involved in the genesis of AMI is atherosclerosis[3], a process that can be intensified by SAH and several other risk factors such as diabetes mellitus (DM), sedentary lifestyle, smoking, unhealthy diet, dyslipidemia , obesity, poverty, low educational level, advanced age, male gender, genetic predisposition and psychological characteristics[5]. As part of these factors is amenable to prevention and treatment, it becomes important to investigate the applicability of health education methodologies for this population[6].

According to the Brazilian government's Strategic Action Plan for Coping with Noncommunicable Chronic Diseases (NCDs), SAH and all modifiable risk factors for AMI should be the focus of actions, strategies and health programs at all levels of care[4]. Within the scope of Primary Healthcare (PHC), promotion, health surveillance and prevention measures are advocated[4]. It is therefore considered that effective PHC is essential to reduce the prevalence of NCDs and mortality rates due to acute syndromes caused by these chronic conditions[4]. As no local publications with this theme were identified, the present study aimed to investigate the factors associated with the history of AMI in hypertensive patients attended at PHC units in the city of Salvador, Bahia.

MATERIAL AND METHODS

A cross-sectional study performed with individuals attended for at health units in peripheral regions of the Cabula-Beiru health district, in the city of Salvador, Bahia. People with the diagnosis of SAH, users of some of the services available by the healthcare units during the period of collection, were included in the study. The sample calculation was made using the Openepi calculator (http://www.openepi.com). The size of the sample was calculated using the Open-Epi version 2 program (http://www.openepi.com). The parameters used were: population of 224,508, outcome prevalence of 26%, confidence limit of 5%, and design effect of 1, estimated in 296 individuals. The sample process adopted was consecutive and for convenience.

Primary data was collected by means of the application of original and structured forms during the period between May and September of 2013, by researchers of a project called "Knowledge Multipliers: Junior Doctors", an initiative of the Ministry of Health in a partnership with Universidade do Estado da Bahia and support of the Municipal Health Department of Salvador. The Public Notice "PRO-Saúde/PET-Saúde Vigilância em Saúde 2011" enabled the actions of a research and extension group made up of professionals of the area and undergraduate students of the courses of Physiotherapy, Speech Therapy, Medicine and Nutrition. All of the researchers were trained for the application of the instruments in order to increase the reliability of the information obtained.

The instrument used consisted of blocks containing variables related to the identification, clinical data,

medical treatment, risk factors, diseases, health assistance for SAH and DM. In relation to the socio-demographic data, age considered as a risk was ≥ 45 years for men and ≥ 55 for women[7].

Skin color was estimated by the interviewer and classified in accordance with the IBGE, but for the purpose of analysis was dichotomously collapsed into white, black and brown. The conjugal situation was categorized in living with or without a partner. Schooling was defined dichotomously into illiterate, complete or incomplete elementary education, complete or incomplete secondary education or higher education. Family income was classified as greater, smaller or equal to one minimum wage.

In relation to clinical characteristics, seven variables were included. Body Mass Index (BMI) was calculated dividing the weight (in kilograms) by the height (in meters) squared and categorized according to criteria preconized by the World Health Organization[8]. For the purpose of analysis these were collapsed to low and normal weight or overweight and obesity. The abdominal circumference measurement considered as risk was of ≥ 88 cm for women and ≥ 102 cm for men[2].

For the definition of blood pressure control the last systolic blood pressure measured by professionals of the unit, where 140mmHg was used as the cut-off point[2]. The variables of diagnosis time of SAH, where the cut-off point was ten years; use of medication for blood pressure control; family history of CVD, diagnosis of DM and history of AMI were considered as dichotomous.

With reference to living habits the variables included were: whether the person had smoked in the last 30 days; smoking; drinking; consuming adequate daily portions of fruit, vegetables and cereals; earing chicken with the skin; eating red meat with apparent fat; adding salt to ready cooked meals and the practice of light or moderate physical activities, for at least 30 minutes and 5 days a week. All the variables were classified categorically. Finally, questions on the quality of the healthcare with the variables: attend the set appointments, location where medications for SAH are obtained, awareness of the existence of health education groups (HEG) for hypertensive people at the PHC unit visited, participate of the HEG, having been to a medical appointment within the last six months, verify the blood pressure during the consultations and having had an electrocardiogram within the last six months. These variables were also considered as dichotomous.

Bivariate analyses were performed with the aim of identifying a set of variables most associated to the history of AMI. The magnitude of the association between the studied variables and prior AMI was estimated through the calculation of the odds ratio (OR), adopting the confidence interval of 95% (CI95%) as a measure of precision. Subsequently multivariate analyses were performed using logistic regression, from the theoretical model defined a priori, and listing the risk factors in hierarchized blocks. The strategy used for the entry of variables in blocks was the forward type (anterograde process), through the module in stages – first block: socio-demographic variables; second block: clinical variables; third block: variables related to living habits; and fourth block: variables relating to the quality of healthcare. Variables with levels of statistical significance remained in the model, whereby $p < 0.10$. The statistical packages used were Excel for Windows (version 3.2) and Stata (version 12.0). The project was approved by Plataforma Brasil/CEP UNEB (CAAE 09656012.0.0000.0057) and financed by PRO Saúde/PET-Saúde 2012.

RESULTS

There were 327 people interviewed, of which 30 were excluded. Of these, 16 (53.3%) developed hypertension in the gestational period, 8 (26.6%) had cognitive alterations and 6 (20.1%) had withdrawn from participating in the study. Out of the 297 individuals analyzed, 35 (11.8%) informed they had suffered AMI, mostly women (26, 74.3%) with average ages of 56 years (58 ± 11.4) (data not tabulated).

Table I lists socio-demographic variables and their association with the history of AMI in hypertensive users of the PHC. The population of the study was mostly composed of individuals of the female gender

Table 1. Association between the history of Acute Myocardial Infarction and socio-demographic variables in patients with Systemic Arterial Hypertension linked to primary healthcare units of a health district, Salvador, Bahia, 2015. N=297

Variables	History of Acute Myocardial Infarction			P value
	n (%)	Gross OR (CI 95%)	Adjusted OR (CI 95%)	
Gender				
Female	243 (81.8)	1	1	
Male	54 (18.2)	1.67 (0.73 – 3.80)	1.85 (0.76 – 4.49)	0.175
Age				
< 45 for men and < 55 for women	175 (58.9)	1	1	
≥ 45 for men and ≥ 55 for women	122 (41.1)	1.13 (0.54 – 2.37)	0.87 (0.39 – 1.93)	0.731
Skin color				
White	22 (7.4)	1		
Black and brown	275 (92.6)	0.57 (0.18 – 1.80)	0.50 (0.15 – 1.66)	0.262
Marital status				
Married or common-law marriage	158 (53.2)	1	1	
Living without partner	139 (48.8)	0.81 (0.40 – 1.64)	0.74 (0.35 – 1.56)	0.424
Schooling				
Secondary school complete / higher education	89 (30.0)	1	1	
Illiterate/ Elementary school	208 (70.0)	1.27 (0.57 – 2.83)	1.51 (0.62 – 3.71)	0.367
Family income (minimum wages)				
> 1	133 (44.8)	1	1	
≤ 1	164 (55.2)	0.84 (0.42 – 1.70)	0.74 (0.34 – 1.62)	0.457

* Variables with p value ≤ 0.10 integrated the multivariate logistic regression model adjusted by gender and age.

(81.8%), of average age for women of 56 years (± 11.5) and for men of 62 years (± 12.43) (data not tabulated). It was verified that 122 (41.1%) patients were of ages considered as of risk. In relation to the skin color, black and brown were the great majority (92.6%). Married or common-law marriage totaled 53.2%. For the schooling level results, 70.0% had elementary school or were illiterate, family income was lower or equal to one minimum wage for 44.8% of the interviewed parties. For the variables of this block no statistically significant associations in relation to the history of AMI were found.

Table 2 lists the data related to the association between prior AMI and clinical variables. Among the hypertensive patients evaluated, 80.1% were classified as being overweight or obese and 79.2% reported family history with CVD. These variables did not demonstrate association with the occurrence of AMI, but remaining in the (p< 0.10) were the concomitant presence of DM (p=0.046), the reduced measure of abdominal circumference found in 71.4% of the users (p=0,074), SAH diagnosis time greater or equal to 10 years (p=0.086) and last measured high systolic blood pressure (p=0.105).

Table 2. Association between the history of Acute Myocardial Infarction and patients with Systemic Arterial Hypertension lined to primary healthcare of a health district, Salvador, Bahia, 2015. N=297

Variables	History of Acute Myocardial Infarction			P value
	n (%)	Gross OR (CI 95%)	Adjusted OR (CI 95%)	
Body mass index				
Below weight or normal	59 (19.9)	1	1	
Overweight/obesity	238 (80.1)	1.23 (0.48 – 3.10)	0.98 (0.37 – 2.65)	0.973
Concomitant diabetes				
No	200 (67.3)	1	1	
Yes	97 (32.7)	2.15 (1.05 – 4.38)	2.15 (1.01 – 4.59)	**0.046**
Abdominal circumference measurement				
≥88 for women and ≥102 for men	85 (28.6)	1	1	
<88 for women and <102 for men	212 (71.4)	0.42 (0.21 – 0.87)	0.48 (0.22 – 1.07)	**0.074**
Family history of cardiovascular diseases				
No	61 (20.8)	1	1	
Yes	232 (79.2)	1.06 (0.44 – 2.55)	1.17 (0.46 – 2.99)	0.741
Takes medicine to treat high blood pressure				
No	15 (5.0)	1	1	
Yes	282 (95.0)	1	1	-
Timeframe of diagnosis of Systemic Arterial Hypertension				
< 10	174 (58.6)	1	1	
≥ 10	123 (41.4)	1.80 (0.89 – 3.67)	1.98 (0.91 – 4.32)	**0.086**
Last systolic blood pressure measured				
Compensated	131 (44.1)	1	1	
Decompensated	166 (55.9)	1.59 (0.76 – 3.34)	1.93 (0.87 – 4.27)	**0.105**

*Variables with p value ≤ 0.10 integrated the multivariate logistic regression model adjusted by gender, age, concomitant diabetes, measurement of abdominal circumference, timeframe of diagnosis and blood pressure control.

The association between prior AMI and living habits is exposed in Table 3. It was observed that most of the population does not present risk factors, except for not consuming adequate daily portions of fruit, vegetables and cereals (74.4%), eating red mead with apparent fat (73.7%) and not practicing light or moderate physical activities for at least 30 minutes 5 days a week (81.8%). Among all the variables related to living habits, only the adequate daily consumption of fruit, vegetables and cereals remained in the model (p=0.087).

Table 3. Association between the history of Acute Myocardial Infarction and Variables related to living habits of patients with Systemic Arterial Hypertension linked to primary healthcare units of a health district, Salvador, Bahia, 2015. N=297

Variables	History of Acute Myocardial Infarction			P value
	n (%)	Gross OR (CI 95%)	Adjusted OR (CI 95%)	
Was a smoker during the last 30 years				
No	273 (91.9)	1	1	
Yes	24 (8.1)	1.56 (0.50 – 4.87)	1.88 (0.00 – 953.15)	0.843
Smokes presently				
No	273 (91.9)	1	1	
Yes	24 (8.1)	1.56 (0.50 – 4.87)	0.85 (0.00 – 422.92)	0.958
Drinks alcoholic beverages				
No	238 (80.1)	1	1	
Yes	59 (19.9)	1.74 (0.78 – 3.86)	1.50 (0.59 – 3.85)	0.397
Consumes daily indicated portions of fruit, vegetables and cereals				
Yes	76 (25.6)	1	1	
No	221 (74.4)	0.62 (0.29 – 1.32)	0.48 (0.21 – 1.11)	**0.087**
Eats chicken with apparent fat				
No	273 (91.9)	1	1	
Yes	24 (8.1)	1.08 (0.30 – 3.81)	1.16 (0.30 – 4.67)	0.829
Eats red meat with apparent fat				
Yes	219 (73.7)	1	1	
No	78 (26.3)	1.14 (0.52 – 2.50)	1.13 (0.48 – 2.67)	0.786
Adds salt to ready-made food				
No	227 (76.4)	1	1	
Yes	70 (23.6)	0.79 (0.33 – 1.90)	0.69 (0.26 – 1.79)	0.444
Practices some light/moderate physical activity for 30 minutes or more				
Yes	54 (18.2)	1	1	
No	243 (81.8)	1.83 (0.62 – 5.41)	2.47 (0.77 – 7.90)	0.127

*Variables with p value ≤ 0.10 integrated the multivariate logistic regression model adjusted by gender, concomitant diabetes, measure of abdominal circumference, timeframe of diagnosis, blood pressure control and daily consumption of indicated portions of vegetables.

The variables related to the association between the quality of the healthcare and the history of AMI are presented in Table 4. It was observed that most of the patients appeared for their appointments (92.6%), obtained medication from the same unit of the consultation (52.8%), were not aware whether in the health unit they attended there was a HEG for hypertensive patients (65,7%) (p=0,053), did not participate of the HEG (83.2%) (p=0.049), had their last medical appointment less than six months before (79.1%), had their blood pressure verified during the consultation (95.3%) had an electrocardiogram within the last six months (62.6%) (p=0.061).

Table 4. Association between the history of Acute Myocardial Infarction and Variables related to the quality of the assistance for patients with Systemic Arterial Hypertension linked to primary healthcare units of a health district, Salvador, Bahia, 2015. N=297

Variables	History of Acute Myocardial Infarction			P value
	n (%)	Gross OR (CI 95%)	Adjusted OR (CI 95%)	
Attends set appointments				
Yes	275 (92.6)	1	1	
No	22 (7.4)	1.75 (0.56 – 5.50)	1.66 (0.42 – 6.59)	0.474
Where is the medication for high blood pressure obtained **				
In the same healthcare unit	149 (52.8)	1	1	
In another healthcare unit	133 (47.2)	0.72 (0.35 – 1.47)	0.77 (0.35 – 1.70)	0.515
Awareness of the existence of any accompaniment / experience group at the unit attended				
Yes	102 (34.3)	1	1	
No	195 (65.7)	1.59 (0.71 – 3.53)	3.61 (0.99 – 13.21)	**0.053**
Participates of support / interaction groups in this unit				
Yes	50 (16.8)	1	1	
No	247 (83.2)	0.54 (0.23 – 1.23)	0.26 (0.07 – 1.00)	**0.049**
When was the last doctor appointment				
Under six months	235 (79.1)	1	1	
Over six months	62 (20.9)	0.45 (0.15 – 1.34)	0.69 (0.21 – 2.28)	0.542
Does any professional verify the blood pressure during the consultation				
Yes	283 (95.3)	1	1	
No	14 (4.7)	1.26 (0.27 – 5.89)	1.91 (0.29 – 12.78)	0.504
Was an electrocardiogram taken in the last six months				
Yes	186 (62.6)	1	1	
No	111 (37.4)	0.38 (0.16 – 0.90)	0.40 (0.15 – 1.04)	**0.061**

* Variables with p value ≤ 0.10 integrated the multivariate logistic regression model adjusted by gender, age, concomitant diabetes, measure of abdominal circumference, timeframe of diagnosis, blood pressure control, daily consumption of indicated portions of vegetable, awareness of the existence of groups, participating of groups and having had an electrocardiogram exam. ** n=282, once 15 individuals do not have medication treatment for SAH.

In Table 5 the final model of the multivariate logistic regression is presented. Having concomitant DM (OR=2.19; CI95% 1.39 – 20.20) and not being aware of the existence of HEG at the PHC unit they attend (OR=5.31; CI95% 1.39 – 20.20) were considered as factors associated to prior AMI; while having abdominal circumference lower than considered as of risk (OR=0,43; CI95% 0,20 – 0,95), participate of the HEG (OR=0.19; CI95% 0.05 – 0.73) and having had electrocardiograms within the last 06 months (OR= 0.37; CI95% 0.15 – 0.92) were evidenced as protection factors.

Table 5. Final model of logistic regression between the history of Acute Myocardial Infarction and selected variables in patients with Systemic Arterial Hypertension lined to primary healthcare units of a health district. Salvador, Bahia, 2013.

Variable	History of Acute Myocardial Infarction		P value
	Gross OR (CI 95%)	Adjusted OR (CI 95%)	
Gender	1.67 (0.73 – 3.80)	1.39 (0.54 – 3.57)	0.495
Age	1.13 (0.54 – 2.37)	0.66 (0.29 – 1.51)	0.327
Concomitant diabetes	2.15 (1.05 – 4.38)	2.19 (1.03 – 4.68)	**0.042**
Measurement of abdominal circumference	0.42 (0.21 – 0.87)	0.43 (0.20 – 0.95)	**0.036**
Awareness of the existence of any accompaniment / experience group at the unit attended	1.59 (0.71 – 3.53)	5.31 (1.39 – 20.20)	**0.014**
Participates of support / interaction groups in this unit	0.54 (0.23 – 1.23)	0.19 (0.05 – 0.73)	**0.015**
Was an electrocardiogram taken in the last six months	0.38 (0.16 – 0.90)	0.37 (0.15 – 0.92)	**0.032**

*Variables with p value ≤ 0.10 integrated the multivariate logistic regression model adjusted by gender, age, concomitant diabetes, measurement of abdominal circumference, awareness of the existence of groups, participation in the groups and having had an electrocardiogram exam in the last 6 months.

DISCUSSION

The results of this study showed that having diabetes and not being aware of the existence of health education groups were factors positively associated with the history of acute myocardial infarction in hypertensive patients accompanied at health units. It should be noted that even after adjustment for potentially confounding variables, these associations remained statistically significant. It was also evidenced that the waist circumference below that considered at risk was considered as protective factors for the history of acute myocardial infarction, participating in support groups for SAH treatment in the unit and performing electrocardiogram in the last six months.

SAH, once it is present in around 40 to 50% of patients with CAD, it is claimed as one of the main axis for secondary prevention capable of decreasing mortality by CVD[9]. It is one of the main risk factors for atherosclerosis and, without adequate treatment, the natural course of the disease causes chronic vascular lesions, increasing the risk of CAD, cerebrovascular accidents and other vascular diseases[5]. Despite the fact that a longer span of the illness could be considered a risk factor for complications, in the studied population, having a time of diagnosis of over 10 years was not considered a risk factor associated to prior AMI. In fact, evidence suggests that having a longer time to diagnose hypertension is not associated with having a better blood pressure control and thus reducing the chances of cardiovascular complications, as pointed out by Barreto et al[9]. For these researchers, the most unfavorable results regarding the control of blood pressure levels are associated with not attending medical appointments regularly and using more than two different medications for blood pressure control[9].

Still in relation to the pressure control, very different rates have been revealed in national articles. In the present study, 44% of hypertensive patients had controlled TA. Barreto et al.[9], who also exclusively evaluated patients with a previous diagnosis of hypertension, showed a 42.6% non-adherence to blood pressure control. Souza et al.[10], who evaluated

the pressure control of users in 15 Primary Health Care (PHU) of Novo Hamburgo, RS, identified that blood pressure control in hypertensive patients is not satisfactorily achieved and maintained and that women controlled better than men, 37.6% and 25.0%, respectively. Martins et al.[11], also in PHU units, when comparing the control rates of SAH in Family Health Strategy (FHS) and Basic Health Unit (BHU) of Petrópolis, RJ, also identified unsatisfactory controls even for those that obtained better results, BHU 39.2%, while in FHS it was 29.2%. It is speculated that the diversity in the frequencies found occur due to the heterogeneity of the work presented and that the non-relation to the history of AMI occurs because the value of the last systolic blood pressure measures is not capable of reflecting prior blood pressure conditions.

One of the factors associated to prior AMI in the present study was the concomitant diagnosis of DM. Hyperglycemia caused by DM is associated to damages to various organs, where the blood vessels are one of the mostly affected structures. The risk of cardiovascular events is two to three times higher in diabetics, whereby CAD causes 60% of the deaths of these individuals(5). The incidence of hypertension in individuals with DM type 1 reaches 70% in the age group of 40 years[2]. In patients with recent diagnosis of DM type 2 this relation is of approximately 40%[2]. According to the 7th Brazilian Guideline of Arterial Hypertension[2], the goal of SAH in diabetics should be in a narrower safety range, that is less than 130/80 mmHg, but not less than 120/70 mmHg.

The prevalence of obesity evaluated by the BMI has been described as a universal risk factor for CVD(5). Nevertheless, despite this being the most used anthropometric index in accompanying patients after coronary interventions, recent researches demonstrate that the measures of central obesity such as abdominal circumference and the waist-hip ratio are better predictors of high coronary risk and AMI[12,13]. In the present study, being overweight or obesity according to the BMI was not associated to prior AMI. Nevertheless, the abdominal circumference measurement is a more reliable indicator and having this parameter below 88 for women and 102 for men was a protection factor.

With reference to health education, Rufino et al.[6] emphasized that it is not uncommon for patients to leave the doctor's office with various uncertainties about the illness. In the case of SAH, even when precise information are transmitted, specific guidance during the consultation do not seem sufficient to cause great changes in living habits. Unilaterally in the doctor-patient dialogue, the use of academic language and the reduce time of the consultation can contribute towards an inefficient health education process.

It should be noted that the population evaluated were mostly poor and had low schooling levels. Apart from these characteristics being risk factors for atherosclerosis[5], the analysis of this data associated to the perception that the health units attended were inserted in underprivileged regions lacking infrastructure, basic sanitation and safety, permitting a better understanding of the social context in which these patients were inserted and foresee possible difficulties in keeping up living habits considered as healthy. In this context, a health education project is essential for an effective change in lifestyles.

In a randomized clinical trial Radovanovic et al.[14] evidenced that the participation in HEG, tied to the practice of physical activities, was sufficient to decrease and/or control blood pressure, biochemical markers and anthropometric indicators such as BMI and the measure of the abdominal circumference. In the present study, participate in the HEG was considered a protection factor, while unawareness of the existence of these groups was considered as a factor associated to prior AMI.

In hypertensive patients 35% of infarction in men and 45% in women are asymptomatic. Despite this, on a long-term, asymptomatic myocardial infarction has a prognosis as bad as the symptomatic one, which makes it periodical monitoring of these patients essential[15]. The questioning "did you have an electrocardiogram within the last six months?" was used as an indicator of the periodicity of this monitoring. Despite nearly 40% of the interviewed parties having answered negatively to the question, the exam was considered a protection factor for the history of AMI. Hypertensive patients submitted to adequate investigation and who performed preventive measures presented less complications[16], therefore having had a more rigorous medical attention may have contributed towards the result obtained.

According to the last Census by the IBGE in 2010, 79% of the population of the city of Salvador are black and the neighborhood with the highest number of individuals self-declared as black belong to the health district evaluated in this study(17). At the time, 53,580 people (82.5%) who declared themselves as black or brown lived in the neighborhood of Pernambués[17]. Further, the black population uses more the healthcare services provided by SUS and less private healthcare than the white population[18].

Current evidence also suggests a strong reduction of racial inequalities in access to health services with increased coverage of basic health care in Brazil[19], and that the expansion of health care between 2000 and 2003 was associated with a twofold reduction in mortality due to conditions sensitive to outpatient treatment in blacks or brown when compared to the white population[20]. In the present study, 92.6% of the interviewed parties were evaluated a black or brown. The homogeneity of the studied population may have collaborated towards the non-association with this variable and the outcome.

It is estimated that approximately 15% of the world population are smokers. Cardiovascular and breathing diseases and cancer are associated to this practice[5]. Nevertheless, the result of the present investigation did not evidence the relation between smoking and prior AMI. It is supposed that the non-correlation between these variables occurs due to the profile of the patients evaluated. While in Brazil smoking occurs with a prevalence of 16,8% (IC95% 12.0 -16.5) in the male population[21], in this study prevalence was considerably lower than the national average and most of the population was of women.

Among the advantages of the research are the production of knowledge for improvement in local healthcare and access to information for management control, aiming to attend to the attributes of the PHC, such as integrity and longitudinality of healthcare. This could be considered as a limitation to the study, the non-association between the evaluated socio-demographic variables and the outcome. It is possible that such a result is due to the homogeneity of the population in relation to these variables. Further, due to the inexistence of an integrated system of patient records, it was not possible to obtain information of complementary exams in order to permit the detection and register of dyslipidemia, another important risk factor, which for this reason could not be evaluated in this study. On the other hand, due to the lack of diagnostic evidence of prior AMI, this outcome was considered self-reported variable.

CONCLUSION

The results found evidence that a high percentage of hypertensive patients attended at the PHC of the investigated health district have history of AMI and that this outcome is associated to the concomitant presence of DM, central obesity, not having periodical electrocardiograms and not participating in the HEG. Population strategies for health promotion, such as the inclusion of HEG and outpatient care in PHC units could be considered effective actions for the prevention of AMI in this population. Nevertheless, researches with greater analytical power should be encouraged with the aim of improving awareness in relation to secondary prevention methods for CAD in the PHC context.

AUTHOR CONTRIBUTIONS

Fraga-Maia H participated in the study design, data collection, analysis and interpretation, paper writing and submission. Nascimento FH participated in the data collection, analysis and interpretation and paper writing. Cavalcante LR and Silva CD participated in the data collection, analysis and interpretation. Zarife AS participated in the data collection, analysis and interpretation, and paper writing. Brito LL participated in the statistical analysis, data interpretation and paper writing.

COMPETING INTERESTS

No financial, legal or political competing interests with third parties (government, commercial, private foundation, etc.) were disclosed for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.).

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