PREVALENCE OF ARTERIAL HYPERTENSION AND ASSOCIATED FACTORS IN THE ELDERLY

Prevalência da hipertensão arterial e fatores associados em idosos

Prevalencia de Hipertensión arterial en mayores y los factores asociados

ABSTRACT

Objective: To investigate the prevalence of systemic hypertension among the elderly and verify the sociodemographic profile, risk factors and complications of elderly individuals identified with hypertension. **Methods:** Quantitative descriptive study, performed with 220 medical records of elderly patients in a Health Center in São Luís, Maranhão, Brazil, between 2011 and 2012. By applying a structured questionnaire containing sociodemographic and clinical variables, data was collected from the medical records and Hiperdia files. Descriptive statistical analysis was performed with the Statistical Package for the Social Sciences and the chi-square test was applied. **Results:** The prevalence of hypertension in the elderly was 51.4% (n=113; IC95%). Of these, 63.7% (n=72) were female; 64.6% (n=73) were sedentary; 52.2% (n=59) were overweight; 53.1% (n=60) had abdominal obesity; 29.2% (n=33) had diabetes; 17.7% (n=20) had comorbidities and complications; 79.6% (n=90) were found with increased blood pressure in the first consultation, and 66.6% (n=60), in the last one. **Conclusion:** The prevalence of hypertension was high among the elderly assessed, being higher in some subgroups: women, low level of education, and non-white. Among the most common risk factors, the sedentary lifestyle, overweight, and abdominal obesity stand out.

Descriptors: Aged; Hypertension; Prevalence.

RESUMO

Objetivo: *Investigar a prevalência de hipertensão arterial sistêmica (HAS) em idosos e verificar perfil sociodemográfico, fatores de risco e complicações dos idosos identificados com hipertensão.* **Métodos:** *Estudo descritivo, quantitativo, realizado com 220 prontuários de idosos em um Centro de Saúde de São Luís-MA, Brasil, entre 2011 e 2012. Por meio da aplicação de um formulário estruturado, coletaram-se dados dos prontuários e das fichas do Hiperdia, com variáveis sociodemográficas e clínicas. Realizou-se análise estatística descritiva com o Statistical Package for the Social Sciences e aplicou-se o teste qui-quadrado.* **Resultados:** *A prevalência da hipertensão entre os idosos foi de 51,4% (n=113; IC95%). Destes, 63,7% (n=72) eram do sexo feminino; 64,6% (n=73), sedentários; 52,2% (n=59) tinham sobrepeso; 53,1% (n=60), obesidade abdominal; 29,2% (n=33) eram diabéticos; 17,7% (n=20) apresentavam comorbidades e complicações; 79,6% (n=90) estavam com a pressão arterial aumentada na primeira consulta; e 66,6% (n=60), na última.* **Conclusão:** *A HAS apresentou alta prevalência nos idosos investigados, sendo maior em determinados subgrupos: mulheres, baixa escolaridade e não brancos. Dentre os fatores de risco mais comuns, destacaram-se o sedentarismo, o sobrepeso e a obesidade abdominal.*

Descritores: *Idoso; Hipertensão; Prevalência.*

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RESUMEN

Objetivo: *Investigar la prevalencia de hipertensión arterial sistémica (HAS) en mayores y verificar el perfil sociodemográfico, factores de riesgo y complicaciones de los mayores identificados con hipertensión.* **Métodos:** *Estudio descriptivo y cuantitativo realizado en 220 historiales clínicos de mayores de un Centro de Salud de São Luíz-MA, Brasil, entre 2011 y 2012. Se recogieron datos de los historiales clínicos y fichas del Hiperdía a través de un formulario estructurado con variables sociodemograficas y clínicas. Se realizó el análisis estadístico descriptivo con el Statistical Package for the Social Sciences y la aplicación de la prueba de Chi-cuadrado.* **Resultados:** *La prevalencia de hipertensión en los mayores fue del 51,4% (n=113; IC95%). De ellos, el 63,7% (n=72) eran del sexo femenino; el 64,6% (n=73) sedentarios; el 52,2% (n=59) tenían sobrepeso; el 53,1% (n=60) obesidad abdominal; el 29,2% (n=33) eran diabéticos; el 17,7% (n=20) presentaban comorbidades y complicaciones; el 79,6% (n=90) presentó la presión arterial elevada en la primera consulta; y el 66,6% (n=60) en la última.* **Conclusión:** *La HAS presento elevada prevalencia en los mayores investigados, siendo la presión arterial mayor en determinados grupos: mujeres, escolaridad baja y mayores no blancos. De los factores de riesgo más comunes, se destacaron el sedentarismo, el sobrepeso y la obesidad abdominal.*

Descriptores: *Anciano; Hipertensión; Prevalencia.*

INTRODUCTION

In Brazil and all around the world, systemic hypertension (SH) has been highlighted for its high incidence and prevalence. This disease occurs when the blood pumps through the vessels at a high pressure – equal to or higher than 140x90mmHg. Its development is multifactorial, and factors include: age, gender, ethnicity, overweight/obesity, salt intake, alcohol consumption, sedentary lifestyle, socioeconomic factors and genetics[1].

It can affect any age group, but there is a great number of older people with SH due to organic changes that aging brings. It is known that the aging process is accompanied by morphological (arterial stiffening), metabolic and psychic changes that contribute to an increase in blood pressure[2].

SH is a public health problem in Brazil and all around the world as it has shown a prevalence of over 30% in the past 20 years, and from 2003-2008, 44 studies conducted in 35 countries showed an overall prevalence of 37.8% in men and 32.1% in women[1]. Additionally, hypertension is a risk factor for cardiovascular diseases, cerebrovascular diseases and chronic kidney disease, accounting for 40% of deaths from cerebrovascular accident (CVA) and 25% of deaths from coronary artery disease. In addition to diabetes,

it accounts for 62.1% of primary diagnosis of people undergoing dialysis[3].

Studies show that over 60% of the Brazilian elderly (> 65 years) are hypertensive[4]. However, information from epidemiological studies on the elderly are rare or poorly disclosed in Brazil until 2008[2]. Furthermore, the elderly population represents 12% of the population according to the last 2010 census[5]. Thus, it is necessary to know the current health situation of older people and their demand for medical services to provide subsidies to the planning of preventive and curative actions, reducing morbidity and mortality, and providing the elderly with a better quality of life. In this sense, primary care is highlighted for prioritizing actions to promote health and disease prevention, constituting a key component for the control of the incidence and prevalence of hypertension in the elderly[2].

Given that, this study aimed to assess the prevalence of SH in the elderly and determine the socio-demographic profile, risk factors and complications of the elderly with hypertension.

METHODS

This is a quantitative descriptive research conducted with older people – individuals aged 60 years and older[6] – duly registered in a Health Center in the municipality of São Luís, Maranhão, Brazil. The city has four teams of the Family Health Strategy (FHS) that assist over four thousand families covered by the program in addition to areas that are not covered. A team in charge of 270 elders enrolled in the program was intentionally selected. The sample was calculated based on the statistical formula for finite populations with a 95% confidence interval, resulting in a sample of 220 elders[7].

The study included records of hypertensive individuals aged 60 or older, regardless of sex, enrolled in the *Hiperdia* program of the Health Center from 2005 to 2011. Patients whose records had insufficient data would be excluded from the research, but no one met these criteria. Records were randomly selected by drawing numbers.

Data were collected from the records and forms of the *Hiperdia* at the reception of the *Unidade Básica de Saúde – UBS* (Basic Health Center) from October 2011 to January 2012.

A structured formulary was used to collect socio-demographic variables (age, sex, race, education), anthropometric variables [weight, height, Body Mass Index (BMI), abdominal circumference (AC)], risk factors (sedentary lifestyle, smoking, family history of cardiovascular disease (FHCD)], blood pressure (BP), medications, diabetes mellitus and complications, including

cerebrovascular accident (CVA), kidney disease and myocardiopathy.

BMI was calculated according to the formula proposed by Ketelet[8] (BMI=kg/m2), which uses the cut-off points for the elderly population according to the recommendations of the Ministry of Health: *low weight* ≤ 22, *eutrophic* >22 and <27, and *overweight* ≥ 27. AC was considered high – abdominal obesity – according to the cut-off points recommended by the World Health Organization (WHO)[9]: AC ≥ 102 cm for men and AC ≥ 88 cm for women. BP, according to the *VI Diretrizes Brasileiras de Hipertensão* (VI Brazilian Guidelines on Hypertension), was classified as follows: *optimal*: < 120 x 80mmHg; *normal*: < 130 x 85mmHg; *borderline*: 130-139 x 85-89mmHg; *stage I hypertension*: 140-159 x 90-99mmHg; *stage II hypertension*: 160-179 x 100-109mmHg; *stage III hypertension*: ≥ 180 x 110mmHg; and *isolated systolic hypertension*: ≥ 140 x < 90mmHg[1].

Descriptive statistical analysis and the Statistical Package for the Social Sciences (SPSS), v. 18.0, were used in combination with the chi-squared test to check the association between socio-demographic variables and risk factors with BP and BMI.

The research respected all the ethical principles of Resolution 466/12[10] of the National Health Council about research with human beings. This study is part of an integrated project approved by the Research Ethics Committee of the *Universidade Federal do Maranhão – UFMA* (Federal University of Maranhão) under Opinion No. 150/2011.

RESULTS

Of the 220 records assessed, 113 reported hypertension, representing a prevalence of 51.4% (CI95%: 44.8% - 58%) of the elderly.

According to the data on the 113 hypertensive elders used in the statistical analysis, the prevalence of SH was higher in women than in men, representing 63.7% (n=72) of the hypertensive elderly. There was a greater number of elders in the age group 70-79 years, accounting for 31% (n=35) of the total and with a mean age of 72.7 years (SD = 72.7 ± 8.9). Most of the elderly, 32.7% (n=37), had an incomplete elementary education and 65.5% (n=74) were non-whites (Table I).

Table I – Distribution of hypertensive elders according to the socio-demographic profile. São Luís, MA, 2011.

Characteristics	n	%	
Sex			
Female	72	63.7	
Male	41	36.3	
Age (years)			Mean ± SD
60-64	20	17.7	72.7 ± 8.9
65-69	30	26.5	
70-79	35	31	
≥ 80	28	24.8	
Education			
Cannot read	30	26.6	
Literate	33	29.2	
Incomplete elementary	37	32.7	
Complete elementary	4	3.5	
Incomplete high school	2	1.8	
Complete high school	2	1.8	
Not available	5	4.4	
Race			
White	38	33.6	
Black	16	14.2	
Yellow	3	2.7	
Parda	51	45.1	
Indigenous	4	3.5	
Not available	1	0.9	

Among hypertensive elders, 15.9% (n=18) had FHCD, most of them were sedentary, 64.6% (n=73), and part of them smoked, 12.4% (n=14). Most of the elderly were overweight 52.2% (n=59), with a mean BMI of 27.7. Abdominal obesity was found in 53.1% (n=60) of the individuals, with a mean abdominal circumference of 92.2 cm.

The total number of hypertensive elders with diabetes accounted for 29.2% (n=33) of the sample. The presence of comorbidities and complications were reported in 17.7% (n=20) of the records, with a prevalence of CVA and kidney disease, with 40% (n=8) and 25% (n=5), respectively (Table II).

The medications most commonly used were Hydrochlorothiazide (HCTZ) (54.8%, n=62), Captopril (50.4%, n=57) and the Propranolol (19.5%, n=22). Patients who used monotherapy accounted for 23% (n=26) of the records and used Captopril and HCTZ with a higher prevalence. The most commonly used form of treatment was the combination therapy, used in 64.6% (n=73) of the patients. A total of 12.4% (n=14) of the patients abandoned the treatment or stopped attending the Health Center.

There was an improvement in blood pressure levels between the first and last consultations, considering that 79.6% (n=90) of individuals presented altered BP ($\geq$140/90 mmHg) in the first consultation and in the last consultation this percentage decreased to 66.6% (n=60). It was observed that patients who were 80 years old or older presented a greater improvement, with a decrease of almost 30% in BP, although blood pressure levels were still high in the last consultation. Regarding sex, both men and women had lowered their blood pressure levels, but men had greater difficulty in controlling BP. Concerning race/color and education, there was a similar positive evolution of blood pressure levels. BP was higher in non-diabetic individuals than in diabetic ones in the first consultation,

Table II - Distribution of hypertensive elders according to the clinical profile. São Luís, MA, 2011.

Characteristics	*n*	%			
Risk factors					
FHCD	18	15.9			
Sedentary lifestyle	73	64.6			
Smoking	14	12.4			
BMI			**Mean ± SD**		
Low weight	10	8.8	27.7 ± 4.4		
Eutrophic	43	38.1			
Overweight	59	52.2			
Altered abdominal waist			**Mean ± SD**		
	60	53.1	92.2 ± 16.9		
Diabetes	33	29.2			
Comorbidities/Complications					
Yes	20	17.7			
CVA	8	40			
Kidney disease	5	25			
Myocardiopathy	2	10			
Others	5	25			
Medications	I*	A**	Total	%	
Hydrochlorothiazide	6	56	62	54.8	
Captopril	14	43	57	50.4	
Propranolol	1	21	22	19.5	
Others	5	32	37	32.8	
TOTAL	26	152	178		
No medication ***	-	-	11		
Discontinuation ****	-	-	3		

FHCD: Family History of Cardiovascular Diseases; BMI: Body Mass Index; CVA: Cerebrovascular Accident; *Isolated use; **Associated use; ***Did not use any medication in the last consultation; ****Did not attend the consultations of the *Hiperdia*.

but the evolution of BP was more favorable in non-diabetic individuals. Patients with comorbidity presented a reduction in BP in the last consultation of 29.5% (n=6), and the ones without comorbidity presented a reduction of 17.3% (n=24) (Table III).

In the first consultation, 1.8% (n=2) of individuals presented optimal BP; 8% (n=9) were classified as normal; 10.6% (n=12) as borderline; 13.3% (n=15) as stage I hypertension; 15% (n=17) as stage II hypertension; 16.8%

(n=19) as stage III hypertension; and 34.6% (n=39) as isolated systolic hypertension.

The study revealed a high prevalence of overweight in hypertensive elders, with a greater proportion of women (56.9%, n=41) when compared to men (43.9%, n=18). Among overweight patients, 56.9% (n=41) were sedentary, 75% (n=45) presented abdominal obesity, 66.7% (n=22) had diabetes and 53.8% (n=50) did not have comorbidities – a proportion that is greater than that of people with some comorbidity (Table IV).

Table III - Distribution of hypertensive elders with blood pressure higher than 140 X 90 mmHg during the first and last consultations. São Luís, MA, 2011.

| Characteristics | BLOOD PRESSURE ≥ 140 X 90 mmHg | | | | | |
| | First Consultation* | | | Last Consultation** | | |
	n	%	p	*n*	%	p
Age			0. 020			0.186
60-64	12	60.0		6	37.5	
65-69	23	76.7		19	67.9	
70-79	28	80.0		18	58.1	
≥ 80	27	96.4		17	68.0	
Sex			0.035			0.024
Male	37	90.2		25	75.8	
Female	53	73.6		35	52.2	
Race/Color			0.597			0.931
White	28	73.7		18	58.1	
Black	12	75.0		8	53.3	
Yellow/Indigenous	6	85.7		3	60.0	
Parda	43	84.3		30	62.5	
Education			0.439			0.244
Cannot read	25	83.3		18	66.7	
Literate	26	78.8		18	54.5	
Incomplete Elem.	28	75.7		18	56.3	
≥ Complete Elem.	8	100		3	100	
Not available	3	60		3	60	
Diabetes			0.092			0.480
Yes	23	69.7		17	54.8	
No	67	83.8		43	62.3	
Comorbidities			0.183			0.043
Yes	13	68.4		7	38.9	
No	77	81.9		53	64.6	

FHCD: Family History of Cardiovascular Diseases; *n=90; **n=60.

Table IV - Distribution of hypertensive elders according to the Body Mass Index BMI and characteristics. São Luís, MA, 2011.

Characteristics	Body Mass Index – BMI						
	Low weight		Eutrophic		Overweight		
	n	%	n	%	n	%	*p*
Sex							
Male	5	12.2	18	43.9	18	43.9	0.328
Female	5	6.9	26	36.1	41	56.9	
Sedentary lifestyle	7	9.7	24	33.3	41	56.9	0.336
Abdominal obesity	0	0.0	15	25.0	45	75.0	< 0.0001
Diabetes	1	3.0	10	30.3	22	66.7	0.113
Comorbidities							
Yes	1	5.3	9	47.4	9	47.4	0.623
No	9	9.7	34	36.5	50	53.8	

DISCUSSION

The prevalence of SH in the elderly (51.4%) was similar to that found in another research that assessed the records of a UBS of the city of Marcelino Ramos, Rio Grande do Sul[11]. However, the prevalence was significantly lower than the one found in a study conducted in Fortaleza, Ceará, i.e., 68.6%[12]. According to the data from DATASUS, which considered individuals aged 65 or older, the prevalence was also lower in relation to the Brazilian elderly population, 63.2%, and individuals from the city of São Luís, 57.2%[13].

In the present research, there was a higher prevalence of SH in women, a result that is similar to those of other studies[14,15]. This is due to the fact that the global prevalence of SH between men and women is higher among women over 50 years old[1]. Additionally, women live longer and seek health services more often than men do, favoring the diagnosis of SH[12].

Regarding education, the prevalence of SH was higher in the elderly with lower education levels. These data are in accordance with the national prevalence and research that detected a low educational profile in the Brazilian elderly[1,16]. However, it is difficult to establish such data[1] given that the present research has been conducted in a suburban area where there is a low education level.

Most of hypertensive elders were non-whites, confirming a research that has verified that SH is two times more prevalent in non-white individuals[1]. However, the impact of miscegenation on SH in Brazil is not exactly known[1].

The FHCD, a non-modifiable risk factor, presented a relatively low prevalence (15.9%) if compared to another research conducted with hypertensive individuals enrolled in the *Hiperdia* program in a municipality of Paraná[17], where most of the individuals had family history of SH (70%). In another study conducted with elders from the suburbs of Fortaleza, Ceará, 59.3% of individuals presented FHCD[2]. The low prevalence of this risk factor in the present study may have been caused by the underreporting of data as the study population may not have accurate information about the health status of their family members.

Sedentary lifestyle was the most prevalent risk factor in the present research, i.e., 64.6% of hypertensive elders, corroborating a cross-sectional study conducted with a sample of 2,100 elders (≥ 65 years) in Northeastern Brazil, in which there was a prevalence of 67.5%[18]. Physical activity is important for the maintenance of health but it has decreased a lot in modern societies, mainly in groups with lower socioeconomic and education levels[19].

The present research revealed a prevalence of smoking of 12.4%, which is similar to the prevalence of 15.2% found in a study conducted with elders aged 65 and older from Southern and Northeastern Brazil who had no diagnosis of hypertension[18].

Regarding BMI, most of hypertensive elders in the present study were overweight, corresponding to 52.2%. Similar data were found in a research conducted with hypertensive and diabetic elders enrolled in the *Hiperdia* program in Pelotas, Rio Grande do Sul, in which 52.3% of the sample was overweight[20]. As for gender, women were more

significantly overweight than men in the present research. Two other studies have also revealed that overweight rates are higher in women than in men[20,21]. Researchers from the Duke University Medical Center discovered that women have 48% more chances of becoming obese than men. The reason for this difference is not well understood yet, but it was observed that the natural tendency to gain more weight than men may explain part of this difference[22].

There was a high prevalence of abdominal fat in the present research, 53.6% of the patients. In another study conducted with hypertensive elders of a Family Health Center of Londrina, Paraná, the prevalence was even higher, 64.3%[21], which may be explained by an expected increase in abdominal adipose tissue during the aging process[21].

Sedentary lifestyle and obesity were highly associated with each other in the present research. A study conducted in Paraná with 53 patients with stage I hypertension observed significant reductions in BMI after six months of regular physical activity[23].

In the present study, 29.2% of hypertensive elders had diabetes, a rate that is higher than that of a research conducted in the municipality of Marcelino Ramos, Rio Grande do Sul, in which there was a prevalence of 7.5%[11].

The use of antihypertensive medications aims to reduce cardiovascular morbidity and mortality, and not only lower blood pressure[1]. In the population of the present study, HCTZ, Captopril and Propranolol were the most commonly prescribed drugs; however, Captopril and HCTZ were mostly used as monotherapy, and combination therapy (64.6%) was more prevalent than monotherapy (23%). Most of the elders need to use combination therapy for the proper control of systolic BP as evidence shows that in two thirds of the patients monotherapy is not sufficient to achieve the expected blood pressure reductions and treat the advanced stages in which the elderly are during the first consultation, indicating the initial use of combination therapy for blood pressure control[1].

One of the reasons why the aforementioned drugs are highly common in the antihypertensive treatment of the Health Center in the present research is that these medications are provided free of cost by Brazil's Unified Health System through Ordinance No. 2982, of November 26, 2009[24]. The Federal, State and Municipal governments have recommended the use of these and other medications in primary care for the treatment of SH.

Drug therapy abandonment and discontinuation of the follow-up of hypertensive elders were highlighted in the present research and in another research that found a prevalence of non-adherence to the *Hiperdia* program of 8.5%. Among the associated factors were elders and

family members' unawareness of the disease and the small participation of the family in the treatment of hypertension[25].

There was an important reduction in BP between the first and last consultations. A research conducted with hypertensive individuals in a UBS in Salvador, Bahia, showed that soon after the introduction of the treatment, 28.9% of the individuals had their BP controlled and 57% had controlled it by the end of the observational period[26]. Women presented a better control of BP in relation to men, maybe because they are less exposed to risk factors such as smoking and drinking and also because of the different attitudes between men and women regarding the control and treatment of diseases[12]. Patients with some comorbidity presented a better control of BP in the present research. This is observed in research with elders aged ≥ 80 years in Spain and elders aged ≥ 65 years in France, considering that they can be treated more aggressively within these circumstances since physicians are generally reluctant to treat elderly patients more aggressively due to the fewer benefits perceived and the increased risk of side effects[27].

It was observed that hypertensive elders presented more advanced stages of SH, which is proportional to older age groups. Additionally, a great percentage (34.5%) of elders presented isolated systolic hypertension – an elevation of systolic blood pressure without the elevation of the diastolic blood pressure. This occurs because systolic blood pressure increases steadily with age; in contrast, diastolic blood pressure increases until age 60 and then starts to lower[28]. According to the 30-year data of a study, this is extremely harmful due to the increased risk of cardiovascular problems with the elevation of systolic pressure, particularly in the elderly[28].

In the present research, overweight was most commonly observed in patients without comorbidities compared to patients with some comorbidity. A study shows that this may be explained by the caretaker's commitment – who is often more present in patients with comorbidities – to influence the adherence to the treatment[29].

The search for the socio-demographic and clinical profile of patients had some limitations because the registration formulary of the *Hiperdia* does not provide some relevant data such as the socioeconomic status, occupation and occurrence of other chronic diseases.

The study suggests that special attention should be given to hypertensive elders, especially the most vulnerable subgroups, aiming to contribute to the control of hypertension and to the health of the elderly, intensifying actions of health promotion, disease prevention, diagnosis, treatment and maintenance of health.

CONCLUSION

Systemic hypertension (SH) presented a high prevalence in the elderly assessed, mainly in certain subgroups: women, low education and non-whites. Among the most common risk factors, sedentary lifestyle, overweight and abdominal obesity were highlighted. The most common complications identified in the elderly were the cerebrovascular accident and kidney disease. On the other hand, there was an improvement in the evolution of blood pressure after starting the clinical treatment.

ACKNOWLEDGEMENTS

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