



Prevalence of hypertension in individuals who sought care at the family health strategy in a city of southeastern Brazil

Oswaldo Costa Moreira^{1*}, Nathália Faria Guimarães², Cláudia Eliza Patrocínio de Oliveira² and Leonice Aparecida Doimo²

¹Instituto de Ciências Biológicas e da Saúde, Universidade Federal de Viçosa, Rua Francisco Machado, 39, 36570-000, Viçosa, Minas Gerais, Brazil. ²Departamento de Educação Física, Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil. *Author for correspondence. E-mail: osvaldo.moreira@ufv.br

ABSTRACT. This study aimed to verify the prevalence of hypertension among individuals who sought care at the Family Health Strategy (FHS) units, registered in Basic Attention Information System (BAIS), in a city of Southeastern Brazil, classified by gender and age. Were evaluated 12,636 individuals who underwent clinical evaluation in ESF units of Viçosa, Minas Gerais State, in the first half of 2011. Data were collected from files registered in BAIS. Statistical analysis consisted of descriptive analysis and calculation of odds ratios according to gender, with a confidence interval of 95% (CI95%). The prevalence of hypertension was 13.40%, in men the prevalence was 11.21%, and in women, 15.53%. The odds ratio indicated that women are 1.46 times more likely CI95% (1.27, 1.52) to present hypertension than men. In both sexes, the prevalence of hypertension increases with advancing age, especially in the age groups above 50 years. We conclude that the prevalence of hypertension was below the national average, being higher in women and increases along with advancing age.

Keywords: epidemiology, public health, hypertension.

Prevalência de hipertensão arterial sistêmica em indivíduos que procuraram atendimento na estratégia saúde da família em uma cidade do sudeste do Brasil

RESUMO. O objetivo do presente estudo foi verificar a prevalência de hipertensão arterial sistêmica (HAS) em indivíduos que procuraram atendimento na Estratégia Saúde da Família (ESF), cadastrados no Sistema de Informação de Atenção Básica (SIAB), de um município do Sudeste do Brasil, segmentados por gênero e por faixa etária. Foram avaliados 12.636 indivíduos que se submeteram à avaliação clínica em unidades de ESF do município de Viçosa, Estado de Minas Gerais, no primeiro semestre de 2011. Os dados foram coletados das fichas que compõem o cadastro do SIAB. O tratamento estatístico constou da análise descritiva dos dados e cálculo da razão de chances, segundo gênero, com intervalo de confiança de 95% (IC95%). Encontrou-se prevalência de HAS de 13,40%, e nos homens a prevalência foi de 11,21% e nas mulheres foi de 15,53%. A razão de chance indicou que as mulheres têm 1,46 vezes mais chances IC95% (1,27; 1,52) de apresentarem HAS, que os homens. Em ambos os gêneros, a prevalência de HAS aumentou conjuntamente com o aumento da idade, sobretudo, nas faixas etárias acima dos 50 anos. Conclui-se que a prevalência de HAS apresentou-se inferior à média nacional, sendo mais elevada nas mulheres e aumentando conjuntamente com o aumento da idade.

Palavras-chave: epidemiologia, saúde pública, hipertensão.

Introduction

The program Family Health Strategy (FHS) aimed at reorganizing the *Sistema Único de Saúde* (SUS) services through primary health care, is operated by multidisciplinary teams in primary health (BRASIL, 2012a). In units of the FHS program, are monitored several chronic diseases, including hypertension, also known as high blood pressure, which associated with other diseases, is most responsible for admissions (SBC, 2010), implying public spending for maintenance of health treatments.

In the world, according to the World Health Organization (WHO, 2002) are estimated over 600

million people with hypertension. In Brazil, the statistics related to hypertension are also starting, since research in Brazilian cities show that the prevalence of this disease varies from 22.3% to 43.9% (SBC, 2010).

There are some risk factors that together and associated with other conditions provide the development of hypertension. Among these risk factors are aging, since the arterial stiffening caused by the aging process contributes to the occurrence of isolated systolic hypertension (GRAVINA et al., 2007). The gender factor acts discretely on hypertension, there is no agreement among authors

about the prevalence, as some studies have indicated a higher prevalence of hypertension in men (AZEVEDO; PAZ, 2006), and others in women (ZAITUNE et al., 2006).

Since it is a silent disease, the prevention, diagnosis and control of hypertension is a problem for the health system. However, it is responsibility of health professionals to identify, early, the risk factors and other conditions related to hypertension. The preventive strategies include the adoption of healthy eating habits, engaging in physical activity and quitting smoking (SBC, 2010).

Therefore, to study the prevalence of hypertension in Brazilian countryside cities, can determine the primary risk and, contribute to the reduction of incidence rates of cardiovascular disease and other associated diseases. Moreover, there is the merit of providing subsidies to health professionals, so that they can establish effective strategies of health promotion, since there is a tendency that the magnitude of preventive and/or therapeutic interventions should be determined by the magnitude of disease incidence in population.

Based on this assumption, this study aimed to verify the prevalence of hypertension among individuals, classified by gender and age, who sought care at the Family Health Strategy (FHS) units, registered in Basic Attention Information System (BAIS), in a city of Southeastern Brazil.

Material and methods

This is an observational, cross-sectional epidemiological study, with sample collected in the Basic Attention Information System (BAIS) database of the Family Health Strategy (FHS), formerly the Family Health Program (FHP) of Viçosa, Minas Gerais State.

Viçosa is located in the Zona da Mata in Minas Gerais State. The city has about 72,220 inhabitants (IBGE, 2012), of which 45,351 (62.8%) are attended by the fifteen health units linked to the FHS in the city, where the epidemiological control of chronic diseases is performed by Basic Attention Information System (BAIS) (BRASIL, 2012c).

For this study, data were collected from five FHS units. The choice of these units was due to the number of people attended and location, covering urban and rural areas, so that the sample had representation before the whole city population. The information from all FHS units is allocated in the Municipal Health Department, where the data of this research were collected.

The sample studied consisted of spontaneous patients attended by FHS units, who underwent

clinical consultation in the first half of 2011, totaling 12636 individuals aged over 10 years, covering 27.86% of the population attended by FHS units, 6236 male and 6400 female.

The classification of blood pressure levels followed the recommendations of the VI Brazilian Guidelines on Hypertension (SBC, 2010) (Table 1). For the analysis was considered the distinction between gender (male or female) and age (divided into seven classes: 10-19, 20-39, 40-49, 50-59, 60-69, 70-79, 80 years or more).

Table 1. Systolic (SBP) and Diastolic (DBP) Blood Pressure: rated for over 18 years.

Classification	Systolic Blood Pressure (mmHg)	Diastolic Blood Pressure (mmHg)
Optimum	< 120	< 80
Normal	< 130	< 85
Borderline	130-139	85-89
Stage 1 hypertension	140-159	90-99
Stage 2 hypertension	160-179	100-109
Stage 3 hypertension	≥ 180	≥ 110
Isolated systolic hypertension	≥ 140	< 90

Source: Adapted from VI DBHA (SBC, 2010).

Data were collected in FHS coordination, in the Municipal Health Department, during a week, at times scheduled by the FHS coordinator. Therefore, there was the involvement of two people, the researcher and a collaborator to query the personal records to each individual attended in 2011 and registered in the BAIS database. This register is updated regularly on the department computer network. The access to information has been previously authorized by the Municipal Health Department and all procedures followed the Guidelines and Standards Research Involving Human (National Health Council Resolution 196/96), in accordance with the Helsinki Declaration of 1964, being approved by the ethics committee for human research of the *Universidade Federal de Viçosa* (Ref. n. of 187/2011/Comitê de Ética).

The hypertension was diagnosed through medical examinations conducted through regular consultations. To measure blood pressure, physicians adopt the indirect method, with the auscultatory technique, using mercury sphygmomanometers, properly calibrated.

The data were stored and processed in the programs Microsoft Office Excel 2010 and Epi Info 6 (Centers for Disease Control and Prevention, Atlanta, USA). Statistical analysis consists of descriptive analysis and calculating the prevalence of hypertension in the sample. In addition, we calculated the odds ratio (OR) of developing hypertension between genders, with a confidence interval of 95%.

Results

Among the 12636 subjects enrolled in the study, 1691 were classified as hypertensive (698 men and 993 women) and the hypertension prevalence was 13.40%. In relation to gender, the hypertension prevalence was 11.21% for men and 15.53% for women. The prevalence stratified by gender and age group is shown in Table 1. Table 2 lists the schematic arrangement of individuals exposed to hypertension, segmented by gender, to calculate the OR.

Table 1. Prevalence of hypertension in individuals attended by the Family Health Strategy segmented by gender and age.

Age (years)	Prevalence of		Prevalence of		Total number of hypertensive	Total hypertension prevalence
	Men	in men	Women	in women		
20-39	49	2.35%	91	4.14%	140	3.27%
40-49	104	13.12%	158	18.88%	262	16.07%
50-59	193	28.30%	258	40.50%	451	34.19%
60-69	180	49.86%	236	58.42%	416	54.38%
70-79	115	61.49%	164	67.49%	279	64.88%
80 or more	57	75.00%	86	66.15%	143	69.42%

Table 2. Schematic layout of the prevalence of hypertension in individuals segmented by gender, to calculate the odds ratio.

	n	Prevalence of		
		Hypertensive	hypertension by gender	OR
Women	6400	993	15.53%	1.46
Men	6236	698	11.21%	

OR: odds ratio; IC95%: confidence interval of 95%.

Discussion

Prevalence of hypertension found in the population attended by FHS units analyzed in the first half of 2011 was 13.40% in Viçosa, Minas Gerais State. Comparing to the study of Vigitel (BRASIL, 2012b), in which the prevalence of hypertension in adults ranged from 12.9% in Palmas, Tocantins State, to 29.8% in Rio de Janeiro, Rio de Janeiro State, the values reported in this study are similar to those of Palmas, Tocantins State (12.9%), Porto Velho, Rondônia State (16.8%) and Boa Vista, Roraima State (17%). The Brazilian Society of Cardiology mapped the disease across the country, through the project named "Hearts of Brazil" (SBC, 2005), with 28.5% of hypertension prevalence. To the Southeast, the same study found a prevalence of 29.1%. When compared to the Minas Gerais State, the findings of this study are lower, since Belo Horizonte, Minas Gerais State has a prevalence of hypertension of 22.4% (BRASIL, 2012b).

The low prevalence of hypertension in this study compared to studies in Brazilian capital cities might be explained by the lifestyle of inhabitants, because

it is country town, where the population has a less stressful routine, which can generate physiological benefits (PUGLIESE et al., 2007). Moreover, because it is a college town, it can be inferred that the academic knowledge production and extension activities may be influencing the people regarding maintenance and prevention of health.

Taking into account gender, the prevalence of hypertension was higher in females (15.53%) compared to males (11.21%), regardless of age. Data from the Health Ministry (BRASIL, 2012b) indicate a prevalence of 25.4% for women and 19.5% for men. Specifically in Belo Horizonte, the same study showed a similar trend, with 25.3% prevalence for women and 19.1% for men.

Additionally, other authors also demonstrate a higher prevalence of hypertension in women, as is the case of Borges et al. (2008) in a study conducted in Belém, Pará State, which reported prevalence of hypertension of 18.3 and 16.2% respectively for women and men; of Cipullo et al. (2010), in a study in São José do Rio Preto, São Paulo State, which found 26.8 and 23.8% hypertension prevalence, for women and men respectively; and of Castro et al. (2007), in a study that assessed the population of Formiga, Minas Gerais State, which showed 33.6% prevalence of hypertension in women and 31.7% in men. Although the aforementioned studies pointed higher prevalence when compared to the present work, all showed that women consistently exhibited higher hypertension rates than men.

The Brazilian Society of Cardiology (SBC, 2010) states that especially after 50 years, women tend to have higher hypertension prevalence. Therefore, the higher prevalence of hypertension in women of this sample might be explained by hormonal changes due to decreased levels of estrogen and progesterone circulating in women especially after menopause (CASANOVA; SPRITZER, 2007), since more than half of women evaluated were aged less than 40 years. Another factor that may have influenced the higher prevalence of hypertension in women is the greater demand for health services, compared to men (ALVES; GODOY, 2001).

In terms of age, the prevalence of hypertension tended to increase with advancing age group. This finding suggests that the aging process has a positive association with increased blood pressure, indicating that increasing age is a risk factor predisposing to the manifestation of this syndrome, for both genders (CASTRO et al., 2007; CIPULLO et al., 2010; BORGES et al., 2008; SBC, 2010). With increasing life expectancy in the world, there is a higher incidence of hypertension. Aging changes make individuals more prone to hypertension developing

(SOUZA et al., 2007), and changes in vascular properties, especially in the aorta, which occur with aging, have an important role in the disease genesis and progression (MIRANDA et al., 2002).

The high prevalence of hypertension, especially in people over 50 years, indicates that the aging process works by intensifying the manifestation of this condition. In addition to the vascular changes caused by the aging process, another factor that may be interfering with this result is the overweight in the elderly population, as noticed in the study of Ferreira and Ferreira (2009) with individuals registered in the HiperDia system, with 60% of elderly with excessive weight (overweight and obesity).

As recommended by the Brazilian Society of Cardiology (SBC, 2010), the non-pharmacological treatment of hypertension encompasses nutrition control, smoking quitting, reduction in body weight and regular practice of physical activity. Thus, the emphasis in the importance of establishing public policies for the prevention of chronic degenerative diseases, so that, through multiple strategies, including non-pharmacological measures such as regular practice of physical exercises, it is possible to control the hypertension, since, with the aging population, they tend to cover an increasingly large number of individuals.

The study has limitations because the record charts had no further important information for a more detailed analysis. These files did not contain socioeconomic information, a fact that prevented the use of parameters like social class and education level to better control the variables. Another limiting factor was the sample composition, since the database was made up of individuals who voluntarily sought health FHS units. This may imply the existence of a large number of individuals who know their health status in the city of Viçosa, Minas Gerais State.

Conclusion

The prevalence of hypertension among individuals who sought care at Family Health Strategy units, registered in the Basic Attention Information System from Viçosa, Minas Gerais State, was 13.40%, with 15.53% for women and 11.21% for men. Although not population-based, this study provided the fraction of hypertensive individuals in a given time interval. Knowledge of the proportion of this disease may contribute to the planning of local health strategies considering the reality of the group, such as planning a program of non-pharmacological intervention through the regular practice of physical activities

for a better quality of life for hypertensive individuals.

Acknowledgements

To the Municipal Health Department of Viçosa, Minas Gerais State.

References

- ALVES, M.; GODOY, S. C. B. Search by worker health care service and absenteeism-illness in a university hospital. **Revista Mineira de Enfermagem**, v. 5, n. 1/2, p. 73-81, 2001.
- AZEVEDO, R. G.; PAZ, M. A. C. The prevalence arterial hypertension in old-age people who attended at "centro de convivência de idosos" de Cuiabá - Mato Grosso. **Estudos Interdisciplinares sobre o Envelhecimento**, v. 9, p. 101-115, 2006.
- BORGES, H. P.; CRUZ, N. C.; MOURA, E. C. Association between hypertension and overweight in adults in Belém, state of Pará (Brazil), 2005. **Arquivos Brasileiros de Cardiologia**, v. 91, n. 2, p. 110-118, 2008.
- BRASIL. Ministério da Saúde do. **Programa Saúde da Família**. Available from: <http://www.portal.saude.gov.br/portal/saude/cidadao/area.cfm?id_area=149>. Access on: Sept. 2, 2012a.
- BRASIL. Ministério da Saúde do. Secretaria de Vigilância em Saúde. **Vigitel Brasil 2011: Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico**. Ministério da Saúde, Secretaria de Vigilância em Saúde, Brasília: Ministério da Saúde, 2012. Available from: <http://www.portalsaude.saude.gov.br/portalsaude/arquivos/pdf/2012/Ago/22/vigitel_2011_final_0812.pdf>. Access on: Sept. 3, 2012b.
- BRASIL. Ministério da Saúde do. **Sistema de informação à atenção básica**. Available from: <<http://www2.datasus.gov.br/SIAB/index.php?area=01>>. Access on: Sept. 3, 2012c.
- CASANOVA, G.; SPRITZER, P. M. Aspectos fisiopatológicos: estrogênios, menopausa e terapia hormonal. **Hipertensão**, v. 10, n. 4, p. 131-134, 2007.
- CASTRO, R. A. A.; MONCAU, J. E. C.; MARCOPITO, L. F. Hypertension prevalence in the city of Formiga, MG (Brazil). **Arquivos Brasileiros de Cardiologia**, v. 88, n. 3, p. 334-339, 2007.
- CIPULLO, J. P.; MARTIN, J. F. V.; CIORLIA, L. A. S.; GODOY, M. R. P.; CAÇÃO, J. C.; LOUREIRO, A. A. C.; CESARINO, C. B.; CARVALHO, A. C.; CORDEIRO, J. A.; BURDMANN, E. A. Hypertension prevalence and risk factors in a brazilian urban population. **Arquivos Brasileiros de Cardiologia**, v. 94, n. 4, p. 519-526, 2010.
- FERREIRA, C. L. R. A.; FERREIRA, M. G. Epidemiological characteristics of diabetic patients within the public health system - an analysis of the HiperDia system. **Arquivos Brasileiros de Endocrinologia e Metabologia**, v. 53, n. 1, p. 80-86, 2009.
- GRAVINA, C. F.; GRESPLAN, S. M.; BORGES, J. L. Non-pharmacological treatment of hypertension in the elderly.

Revista Brasileira de Hipertensão, v. 14, n. 1, p. 33-36, 2007.

IBGE-Instituto Brasileiro de Geografia e Estatística. **IBGE cidades**. Available from: <<http://www.ibge.gov.br/cidadesat/topwindow.htm?1>>. Access on: Sept. 2, 2012.

MIRANDA, R. D.; PERROTTI, T. C.; BELLINAZZI, V. R.; NÓBREGA, T. M.; CENDOROGLO, M. S.; TONIOLO NETO, J. Arterial hypertension in the elderly: peculiarities of physiopathology, diagnostics, and treatment. **Revista Brasileira de Hipertensão**, v. 9, n. 3, p. 293-300, 2002.

PUGLIESE, R.; ZANELLA, M. T.; BLAY, S. L.; PLAVINIK, F.; ANDRADE, M. A.; GALVÃO, R. Efficacy of lifestyle change psychological intervention in coronary risk reduction. **Arquivos Brasileiros de Cardiologia**, v. 89, n. 4, p. 225-230, 2007.

SBC-Sociedade Brasileira de Cardiologia. Sociedade Brasileira de Hipertensão, Sociedade Brasileira de Nefrologia. VI Diretrizes Brasileiras de Hipertensão Arterial. **Arquivos Brasileiros de Cardiologia**, v. 95, n. 1, suppl. 1, p. 1-51, 2010.

SBC-Sociedade Brasileira de Cardiologia. **Atlas corações do Brasil**. 2005. Available from: <http://www.prefeitura.sp.gov.br/cidade/secretarias/upload/saude/arquivos/programas/Atlas_CoracoesBrasil.pdf>. Access on: Sept. 2, 2012.

SOUZA, A. R. A.; COSTA, A.; NAKAMURA, D.; MOCHETI, L. N.; STEVANATO FILHO, P. R.; OVANDO, L. A. A study on systemic arterial hypertension in Campo Grande, MS, Brazil. **Arquivos Brasileiros de Cardiologia**, v. 88, n. 4, p. 441-446, 2007.

WHO-World Health Organization. Issues of communication and risk. **World health report 2002: from non-communicable diseases and mental health (NMH) communications**. Geneva: WHO, 2002.

ZAITUNE, M. P. A.; BARROS, M. B. A.; CÉSAR, C. L. G.; CARANDINA, L.; GOLDBAUM, M. Arterial hypertension in the elderly: prevalence, associated factors, and control practices in Campinas, São Paulo, Brazil. **Cadernos de Saúde Pública**, v. 22, n. 2, p. 285-294, 2006.

Received on September 27, 2012.
Accepted on August 13, 2013.

Received on September 27, 2012.

Accepted on August 13, 2013.

License information: This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.