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Arterial hypertension diagnostic and drug therapy failure among Brazilian elderly – FIBRA Study

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Abstract *This study aimed to investigate the prevalence of failure in hypertension diagnosis, antihypertensive drug use and drug therapy efficacy and the association of these parameters with sociodemographic, health-related and access to health services variables in community-dwelling elderly. This is a descriptive cross-sectional study with 3,478 elderly from different Brazilian regions. We used Pearson's chi-square test to verify associations between outcomes and independent variables, and Poisson multiple regression to estimate crude and adjusted prevalence ratios. Of the total, 29.6% of the elderly evidenced failure in the diagnosis, 4.6% in the use of antihypertensives and 65.3% in drug efficacy. Diagnostic failure was associated with males, presence of morbidity, having a partner, white skin color/ethnicity, having access to the health covenant or private health service, with low/medium personal income and working. Antihypertensive use failure was associated with low/medium personal income and work. Hypertension management failures are prevalent in community-dwelling elderly. There is a need for actions that minimize the negative impact of these health shortcomings, in a country burdened by social, economic and ethnic differences.*

Key words *Hypertension, Elderly, Access to health services, Vulnerability in health*

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Introduction

Ageing generates progressive changes in the organic systems, which determine the loss of adaptability to the environment, increased vulnerability and probability for the development of chronic degenerative diseases, among which is systemic arterial hypertension (SAH), a prevalent clinical condition among the elderly population[1].

According to data from the 2013 National Health Survey[2], the prevalence of self-reported hypertension in people aged 60-64 years was 44.4%. In the more advanced age groups of 65-74 years and 75 years and over, hypertensive rate was higher at 52.7% and 55.0%, respectively. Moreover, distribution was unequal between genders, with an increasing trend among older women.

Hypertension is frequent and an important risk factor for cardiovascular events and is associated with functional disability and death in the elderly[3]. While mortality due to cardiovascular diseases has shown a decreasing trend in recent years, SAH early diagnosis is fundamental for the establishment of actions that ensure disease control and prevent complications[4].

The literature evidences improved access to hypertension treatment in Brazil[5]; however, coverage is still inadequate, with low control rates[6]. The understanding of conditions that underpin shortcomings in the diagnosis and treatment of hypertension enables the analysis of access to services and treatment and equity, favoring prevention, health promotion and education actions.

Thus, this study aimed to investigate the prevalence of failure in SAH diagnosis, regular antihypertensive drug use and drug therapy efficacy and the association of these parameters with sociodemographic, functional capacity, multimorbidity and non-institutionalized elderly access to health services variables.

Methods

This is a cross-sectional descriptive study of data from the main multicenter project called FIBRA (Brazilian Elderly Frailty) – Unicamp complex, which aimed to identify community-dwelling elderly's frailty conditions and was approved by the Research Ethics Committee of the Faculty of Medical Sciences of Unicamp[7].

In total, 3,478 elderly from different locations, selected by simple random sampling from urban census tracts of cities chosen through convenience sampling were evaluated. In order to calculate the sample size, a sampling error of 4% was accepted for cities with more than 1 million inhabitants (601 elderly in Campinas, São Paulo and Belém, Pará) and 5% in those with a population of less than 1 million of inhabitants (235 elderly in Ivoti, Rio Grande do Sul and 384 elderly in the remaining cities). The number of elderly included in each census tract observed the distribution proportionality in the age groups of 65-69, 70-74, 75-79 and more than 80 years, according to the number of elderly of these segments in the urban population of each city[8]. The number of census tracts drawn and recruited and the definition of regions for the comparative analyses were: South/Southeast, consisting of the municipalities of Campinas, São Paulo (90 census tracts), Poços de Caldas, Minas Gerais (75 census tracts), Ivoti, Rio Grande do Sul (27 census tracts) and sub-district Ermelino Matarazzo, São Paulo (62 census tracts); North/Northeast, consisting of municipalities of Belém, Pará, (93 census tracts), Parnaíba, Piauí (60 census tracts) and Campina Grande, Paraíba (60 census tracts). The recruitment of elderly was not epidemiologically perfect within each census tract.

Inclusion criteria were age 65 years and over, understanding the instructions, agreeing to participate and being a permanent resident at home and in the census tract. Exclusion criteria were severe cognitive impairments suggestive of dementia, wheelchair use or being temporarily or permanently bedridden, suffering from severe sequelae of stroke, having Parkinson's disease, being a carrier of severe hearing or vision impairment, seriously compromising communication and being in a terminal stage[9,10].

Recruitment included two stages, the first of which was information to the community involved, with lectures and announcements in the media. The second consisted of recruiters' visits to the elderly. The elderly who were recruited moved on to the data collection stage in a previously scheduled place, date and time. Data collection sessions ranged from 40 to 120 minutes. The elderly were informed about FIBRA study's characteristics and signed the Informed Consent Form if they agreed to participate.

Elderly participants were referred to an interviewer for the first stage of data collection and were submitted to measurement of socioeconomic and demographic variables, anthropometric measures, blood pressure, frailty and cognitive status by MMSE[11]. Cutoff points used to define cognitive impairment by MMSE were 17 for the illiterate; 22 for the elderly with 1-4 years

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schooling; 24 for those with 5-8 years schooling; and 26 for those with 9 years or more schooling[12].

Individual scores below the cutoff point for their level of schooling participated only in the first stage of data collection and then were dismissed. Elderly scoring above the cutoff points in the MMSE measured variables collected in the first stage and self-reported measures about functional physical conditions, care and psychosocial variables[7].

All the information was collected and recorded by trained interviewers, and sociodemographic variables age, gender, skin color/ethnicity, personal income, current work status and marital status were selected for this study. Variable "morbidities" was also selected and was characterized by the number of diseases reported through the question: "Has any doctor ever diagnosed any of the diseases listed?", and classified in two categories (one disease or two and more chronic diseases).

Regarding functional capacity, independence levels for basic activities of daily life (BADL)[13] and instrumental activities of daily living (IADL)[14] were investigated, and the elderly reporting that they did not need help for any activity were classified as independent and those who reported needing partial or total help for one or more activities were classified as dependent.

Access to the health service was defined as the type of health service frequently used and reported by the elderly in the interview (public health services, covenants, private health plans and private services paid directly by the patient).

The "blood pressure" (BP) variable was obtained through three consecutive measurements of systolic blood pressure (SBP) and diastolic blood pressure (DBP) in a sitting position, with the arm supported at the approximate height of the heart. Measurements were performed at 1-minute intervals, according to the Brazilian Hypertension Guideline recommendations[7,15], using the Omron HEM-705 CP IT® sphygmomanometer. The elderly were instructed to do bladder emptying before measurements and placed in a comfortable 5-minute rest in a seated position. They were also instructed to avoid coffee consumption, smoking and high food intake before the interview. Simple means were calculated from the values obtained and then recorded as continuous values, in mmHg. The classification of SAH was based on SBP and DBP means. Individuals with mean SBP>140 mmHg and DBP>90 mmHg were classified as hypertensive, those with mean SBP>140 mmHg and DBP<90 mmHg as patients with isolated systolic hypertension (ISH) and those with means of SBP<140 mmHg and DBP<90 mmHg[15] as normotensive patients.

The following dependent variables were created: (1) Failure in the diagnosis of hypertension, defined by the record of arterial hypertension in an individual who did not self-declare as hypertensive; (2) Failure in the use of regular medications for SAH, corresponding to the elderly who declared themselves hypertensive, but did not use antihypertensive medication; (3) Failure in the effectiveness of the drug treatment, by self-reported hypertension among participants taking antihypertensive medication, but with high BP values at the time of collection (those classified with SAH and ISH).

All analyses were performed by statistical program Stata® SE version 14.0. Associations between variables were verified by Pearson's chi-square test with a significance level of 5%. Then, a Poisson regression analysis was performed with robust, crude and adjusted variance (by type of service used, that is, private or public service users, since access to services was associated with income), with prevalence ratio (PR) and respective 95% confidence intervals (95% CI). We chose this statistical model because the dependent variables are highly prevalent in the population and because this cross-sectional study used prevalence ratio as a measure of association.

Results

According to the sample studied, elderly's mean age was 72.9 years, and 67.6% were women and most (53.75%) resided in the South/Southeast regions of the country. Table 1 shows the distribution of the dependent variables; 29.6% had diagnostic failure, 4.6% showed failure in the use of medication and 65.3% had failed efficacy (Table 1).

Considering diagnostic failure, we observed a higher prevalence in the male elderly, with a personal income of up to three minimum wages, who worked, lived with a partner, had one morbidity and were private health services users (Table 2). Specifically, in the South/Southeast regions, the highest prevalence ratios for diagnostic failure were individuals who worked and used private health services, and lower prevalence rates were among black/mulatto females living without partners and reporting two or more morbidities (Table 2). In the North/Northeast regions, lower prevalence ratios were found for

females, with an income of 1-3 minimum wages and reporting two or more morbidities (Table 2).

Table 3 shows a higher prevalence of failure to use antihypertensive medication in male elderly and in those who worked. Furthermore, in the South/Southeast regions, the highest prevalence rate for drug use failure occurred among those who worked, a result also found in the North/Northeast regions, in addition to the significance maintained among elderly individuals receiving 1-3 minimum wages (MW).

SAH drug therapy efficacy failure showed a higher prevalence for males aged 75 years and older, not mentioning being white and having up to one morbidity; on the other hand, reporting monthly income of 1-3 MW showed lower prevalence in relation to the reference category (Table 4).

Discussion

SAH is a widely studied clinical condition; however, little is known about the factors associated with the lack of knowledge of the diagnosis of hypertension, failures in the use of antihypertensive drugs and the efficacy of drug therapy among hypertensive patients. Understanding the determinants of these shortcomings is a challenge.

In this context, this study showed the expressive failure prevalence of 29.6% and 65.3% for diagnosis and hypertension treatment efficacy, respectively, in non-institutionalized elderly people living in different Brazilian regions. Specifically, the lack of knowledge of the disease diagnosis was associated with males, presence of one morbidity, having a partner, white skin color/ethnicity, access to covenant or private health services, low and medium personal income and working. In addition, antihypertensive drug use failure was significantly associated with low and medium income and working. Notably, the main results also showed dissimilarities in these associations, according to the regions studied.

Previous data show the extent of shortcomings in SAH diagnosis and treatment in Brazil. It is estimated that one third of the hypertensive population is unaware of the clinical diagnosis of the disease and, among diagnosed, only 30% check their pressure[16]. Despite medical advances in recent years, there is a need to pay more attention to these failures, especially among the elderly, because they have high rates of hypertension and are more vulnerable.

In a recent study, Bezerra et al.[17] showed the difficulty in accessing the diagnosis and treatment of hypertension in Brazilians with greater social and health vulnerabilities. The sample consisted of 350 participants with a wide age group (18 years and over) of quilombola communities. Authors noted that more than 30% of hypertensive patients were unaware of the diagnosis of SAH and pointed out that there was a positive association between the lack of knowledge of stage 1 SAH disease and males.

Corroborating these findings, our study evidenced a higher prevalence in the lack of knowledge of hypertension in elderly men, for all regions included in the study. It is known that due to behavioral and cultural issues, men seek health services less frequently and have fewer consultations. Awareness of treatment and prevention is still typically female[18-20].

Diagnostic failure in the North/Northeast and South/Southeast regions was also higher among individuals with only one reported chronic disease. The hypothesis for this result consists in the attitudes of greater needs and search for health services among patients with simultaneous diseases, consequently increasing the probability of knowing the diagnosis[17,21,22]. Studies carried out at the national[23] and international levels[24] show the trend of greater demand for medical care among the elderly with multimorbidity, and this clinical condition is related to greater risks of complications and unfavorable outcomes in the more advanced age groups.

Table 1. Percentage distribution of the variables diagnostic failure, failure in the use and efficacy of antihypertensive drugs, according to regions. FIBRA 2008/09.

Variables	% (n)	South/ Southeast	North/ Northeast
SAH diagnosis failure			
Yes	29.6 (583)	27.3 (281)	32.1 (302)
No	70.4 (1391)	72.7 (751)	67.9 (640)
Failure in the use of antihypertensives drugs			
Yes	4.6 (97)	3.3 (39)	6.3 (58)
No	95.4 (2032)	96.7 (1165)	93.7 (867)
Drug efficacy failure			
Yes	65.3 (1311)	62.5 (717)	69.0 (594)
No	34.7 (698)	37.5 (431)	31.0 (267)

Table 2. Prevalence of diagnostic failure and prevalence ratio, according to sociodemographic, health and access to health service variables in community-dwelling elderly. FIBRA 2008/09.

Variables	Prevalence (%)	South/Southeast		North/Northeast	
		Crude PR	Adjusted PR	Crude PR	Adjusted PR**
Gender*	<0.001				
Male	38.6	1	1	1	1
Female	24.7	0.59 (0.47-0.76)	0.62 (0.48-0.81)	0.65 (0.52-0.82)	0.63 (0.48-0.82)
Age group (years)	0.726				
65-69	30.9	1	1	1	1
70-74	28.7	1.00 (0.74-1.35)	0.94 (0.68-1.29)	0.89 (0.67-1.19)	0.84 (0.60-1.18)
75-79	28.0	0.90 (0.64-1.28)	0.96 (0.66-1.40)	0.90 (0.65-1.23)	0.86 (0.89-1.25)
80+	30.1	1.17 (0.82-1.67)	1.24 (0.83-1.84)	0.89 (0.63-1.25)	0.73 (0.46-1.14)
Skin color / ethnicity*	0.055				
White	31.4	1	1	1	1
Black, mulatto, caboclo and brown	27.4	0.62 (0.48-0.80)	0.65 (0.45-0.92)	0.89 (0.69-1.14)	0.94 (0.69-1.28)
Personal Income* (Minimum wages – MW)	0.021				
< 1 MW	26.8	1	1	1	1
1-3 MW	31.3	1.15 (0.86-1.54)	1.01 (0.73-1.39)	1.32 (1.03-1.70)	1.42 (1.06-1.92)
> 3 MW	34.2	1.62 (1.19-2.20)	1.32 (0.92-1.89)	0.94 (0.64-1.39)	0.84 (0.53-1.35)
Employment status*	<0.001				
Not working	27.3	1	1	1	1
Working	43.1	1.75 (1.32-2.32)	1.60 (1.18-2.16)	1.41 (1.04-1.91)	1.38 (0.97-1.97)
Marital status*	0.007				
With partner	32.4	1	1	1	1
Without partner	26.9	0.65 (0.51-0.84)	0.71 (0.54-0.94)	0.80 (0.70-1.11)	0.89 (0.68-1.18)
Morbidities*	<0.001				
≤ 1	37.3	1	1	1	1
≥ 2	22.2	0.56 (0.42-0.74)	0.59 (0.45-0.78)	0.60 (0.45-0.81)	0.62 (0.46-0.83)
Functional capacity	0.654				
Independent	29.9	1	1	1	1
Dependent	31.3	1.27 (0.90-1.79)	1.28 (0.92-1.79)	0.84 (0.59-1.22)	0.86 (0.59-1.23)
Access to health services*	0.006				
Public network	27.5	1	1	1	1
Covenants or private	34.2	1.24 (1.03-1.50)	1.24 (1.03-1.50)	1.23 (0.93-1.64)	1.23 (0.93-1.64)

*Statistical significance $p < 0.05$. **Adjusted by health service type.

Again, in the total population, a higher prevalence of diagnosis failure was observed among the elderly with partners. However, interestingly, the South/Southeast regions showed a lower prevalence of the lack of knowledge of SAH among those who had no partners. These results are in agreement with a previously published study[25], in which it identified the highest rates of SAH reported in unmarried or single elderly. In addition, authors emphasized that life without a partner interferes with emotional well-being and hastens the onset of chronic diseases, and in these cases of health vulnerabilities, medical demand is more frequent and would be related to greater knowledge of the diagnosis of the disease.

Black, caboclo, mulatto and brown were negatively associated with diagnostic failure in the South/Southeast regions. It is suggested that there is a greater preparation of network health professionals in relation to the epidemiological characteristics of SAH in the more developed regions. Another hypothesis is the high percentage of black and mainly brown individuals in the north and northeast of Brazil[26], and this factor

Table 3. Prevalence of failure in the use of antihypertensive drugs and prevalence ratio, according to sociodemographic, health and access to health service variables in community-dwelling elderly. FIBRA 2008/09.

Variables	Prevalence (%)	South/Southeast		North/Northeast	
		Crude PR	Adjusted PR	Crude PR	Adjusted PR**
Gender*	0.012				
Male	6.4	1	1	1	1
Female	3.8	0.51 (0.27-0.96)	0.74 (0.34-1.61)	0.66 (0.39-1.13)	0.69 (0.38-1.25)
Age group (years)	0.863				
65-69	4.2	1	1	1	1
70-74	4.3	0.73 (0.31-1.72)	0.75 (0.26-2.11)	1.25 (0.66-2.38)	1.04 (0.52-2.06)
75-79	5.2	1.39 (0.61-3.17)	1.28 (0.68-4.63)	1.10 (0.53-2.28)	0.88 (0.38-2.04)
80+	4.8	1.56 (0.62-3.92)	2.22 (0.74-6.65)	0.84 (0.36-1.91)	0.90 (0.35-2.29)
Skin color / ethnicity	0.063				
White	3.8	1	1	1	1
Black, mulatto, caboclo and brown	5.5	0.65 (0.34-1.24)	0.72 (0.29-1.82)	1.53 (0.81-2.89)	1.40 (0.70-2.78)
Personal Income (Minimum wages – MW)	0.083				
< 1 MW	4.6	1	1	1	1
1-3 MW	5.7	1.13 (0.57-2.25)	1.09 (0.48-2.50)	1.65 (0.96-2.83)	2.12 (1.15-3.91)
> 3 MW	2.6	0.82 (0.31-2.11)	0.72 (0.23-2.24)	0.44 (0.13-1.44)	0.58 (0.16-2.04)
Employment status*	<0.001				
Not working	3.9	1	1	1	1
Working	9.2	2.08 (1.00-4.39)	2.44 (1.07-5.55)	2.65 (1.45-4.85)	2.86 (1.52-5.36)
Marital status	0.156				
With partner	5.3	1	1	1	1
Without partner	4.0	0.68 (0.36-1.29)	0.89 (0.42-1.88)	0.74 (0.44-1.24)	0.85 (0.48-1.51)
Morbidities	0.164				
≤ 1	5.6	1	1	1	1
≥ 2	4.1	0.84 (0.41-1.72)	0.97 (0.46-2.06)	0.67 (0.37-1.21)	0.70 (0.39-1.27)
Functional capacity	0.945				
Independent	4.8	1	1	1	1
Dependent	4.9	0.85 (0.29-2.45)	0.94 (0.32-2.74)	1.00 (0.50-2.01)	1.02 (0.50-2.05)
Access to health services	0.431				
Public network	5.2	1	1	1	1
Covenants or private	4.3	0.83 (0.51-1.33)	0.83 (0.51-1.33)	0.71 (0.37-1.37)	0.71 (0.37-1.37)

*Statistical significance $p < 0.05$. **Adjusted by health service type.

may have influenced the regression analysis, mitigating statistical differences through lower ethnicity variability.

Again, in relation to the South/Southeast, interestingly, the covenant and private health service was associated with the diagnostic failure. It is well known that the public health system has some shortcomings, such as difficult access to services; frequent impossibility of scheduling and choosing professionals/providers; long waiting list for elective surgeries and especially low supply of diagnostic and therapeutic support services. These limitations lead the population to disbelief in the public service, and many seek private services, health plans or insurers, especially the elderly for reasons of greater need and use[27]. However, the current Brazilian health system has notable advances in the provision of programs, projects, policies and increased coverage with relevant results. These advances are also understood as a new comprehensive look at the patient, characterized by interdisciplinarity that goes against fragmented treatment in specialties, in which it is common in health covenants[28-30].

However, in spite of progress, access to health is still inadequate, selective and exclu-

Table 4. Prevalence of drug therapy failure and prevalence ratio, according to sociodemographic, health and access to health service variables in community-dwelling elderly. FIBRA 2008/09.

Variables	Prevalence	South/Southeast		North/Northeast	
	(%)	Crude PR	Adjusted PR	Crude PR	Adjusted PR**
Gender*	0,001				
Male	70,9	1	1	1	1
Female	63,1	0,86 (0,73-1,01)	0,85 (0,71-1,02)	0,92 (0,77-1,10)	0,91 (0,74-1,12)
Age group (years)	0,005				
65-69	62,9	1	1	1	1
70-74	62,1	0,88 (0,73-1,05)	0,94 (0,76-1,15)	1,09 (0,89-1,34)	1,21 (0,95 -1,54)
75-79	69,8	1,02 (0,83-1,26)	1,00 (0,79-1,28)	1,12 (0,89 -1,41)	1,27 (0,97-1,66)
80+	71,4	1,07 (0,84-1,36)	1,13 (0,84-1,52)	1,06 (0,84-1,35)	1,25 (0,93-1,69)
Skin color / ethnicity	0,001				
White	61,7	1	1	1	1
Black, mulatto, caboclo and brown	69,3	0,93 (0,80-1,08)	1,07 (0,89-1,30)	1,11 (0,93-1,34)	1,06 (0,85-1,32)
Personal Income (Minimum wages – MW)	0,010				
< 1 MW	68,2	1	1	1	1
1-3 MW	60,9	0,95 (0,80-1,13)	1,01 (0,82 -1,23)	0,83 (0,69-1,02)	0,90 (0,71-1,14)
> 3 MW	65,4	1,07 (0,87-1,32)	1,14 (0,88-1,46)	0,92 (0,72-1,17)	1,02 (0,75-1,38)
Employment status*	0,331				
Not working	65,5	1	1	1	1
Working	62,2	0,92 (0,73-1,17)	1,02 (0,79-1,31)	0,94 (0,71-1,24)	0,92 (0,67-1,25)
Marital status	0,494				
With partner	66,1	1	1	1	1
Without partner	64,6	0,98 (0,85-1,14)	0,91 (0,76-1,08)	0,94 (0,80-1,11)	0,94 (0,78-1,14)
Morbidities	0,016				
≤ 1	67,7	1	1	1	1
≥ 2	61,7	0,90 (0,76-1,07)	0,90 (0,76-1,07)	0,91 (0,75-1,10)	0,90 (0,74-1,09)
Functional capacity	0,576				
Independent	64,7	1	1	1	1
Dependent	62,9	0,87 (0,68-1,12)	0,92 (0,72-1,17)	0,96 (0,76-1,22)	0,96 (0,76-1,23)
Access to health services	0,431				
Public network	5,2	1	1	1	1
Covenants or private	4,3	0,90 (0,79-1,02)	0,90 (0,79-1,02)	0,84 (0,68-1,04)	0,84 (0,68-1,04)

*Statistical significance $p < 0.05$. **Adjusted by health service type.

sionary in many cases, with socioeconomic and geographical hurdles in relation to the guarantee of universality[31,32]. In fact, in this research in less socioeconomically favored regions (North and Northeast), low and medium income is highlighted as a relevant factor in the diagnostic failure of hypertension and in the use of antihypertensive medication. The literature emphasizes that in countries with unequal income distribution, both low and medium income groups suffer from the worst health situation; on the other hand, in regions where a society is equitable, even the poorest groups have a better health status[33,34].

Interestingly, work activity in old age was also an important factor in the level of failure in the diagnosis and the use of antihypertensive drugs in the evaluated regions. It is worth remembering that Brazilian elderly are increasingly introduced in the labor market. According to data from the Brazilian Institute of Geography and Statistics (IBGE), in 2012, people aged 60 and over held 27% of jobs, with a progressive rate increase trend for the coming years[35].

Although work means occupation and a sense of usefulness in society, for some elderly people, retirement allows free time for self-care

and many of them enjoy this benefit by performing pleasurable activities and self-care. The idle period is related to the opportunity to perform physical activities and search for medical care[36].

The variable failed drug therapy efficacy did not obtain the same statistical effect of association observed in the aforementioned outcomes. It is worth noting the difficulty of analyzing the BP variable, based on BP *in loco* measurements, which are subject to the variability resulting from the psychological aspects of participants at the time of screening, such as "white coat hypertension"; even if plausible, now potential bias, the proportion of failed efficacy in the total sample is high. In addition, our study did not analyze non-pharmacological measures such as diet, physical exercise and health education, in relation to the management of hypertension in the studied population. We understand that the treatment of hypertension is based on all pharmacological and non-pharmacological treatment modalities, which are complementary and influential in the control of pressure levels.

The limitation of this research is the cross-sectional design of this study, which does not allow us to describe cause and effect relationships from the analyzed variables. More than identifying risk factors, it is necessary to further study the longitudinal relationship between the social and health determinants involved in the SAH health/disease process. Another critical point is that the timely measurement of blood pressure, even if done systematically and according to the best consensuses, may not accurately represent the blood pressure condition of these elderly patients in their usual environment. However, this is a common condition for blood pressure studies, which does not minimize the importance of the findings.

Conclusion

Failures in the diagnosis of SAH and in the use and efficacy of antihypertensive drugs were prevalent in community-dwelling elderly. Above all, differences in the prevalence of failures among Brazilian regions, through social, economic and ethnic aspects reflect health shortcomings in the most vulnerable groups of the elderly, which deserve special attention. Measures are required to enable adequate screening and treatment of hypertension in a territorially extensive country with socioeconomic differences and intense miscegenation.

Collaborations

MR Santimaria and A Fattori: project design, data analysis and interpretation, and article writing. FSA Borim: data analysis and interpretation, writing and critical review relevant to the intellectual content of the article. DEC Leme: writing, critical review relevant to intellectual content and final revision of the article to be published. AL Neri: critical review relevant to the intellectual content of the article.

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