

Dialogue between primary and secondary health care providers in a Brazilian hypertensive population

 Chislene Pereira Vanelli, MSc^{1,2,3}

Mônica Barros Costa, PhD^{1,2}

Fernando Antonio Basile Colugnati, PhD^{1,2}

Hélady Sanders Pinheiro, PhD^{1,2}

Elaine Amaral de Paula, MSc^{1,4}

Christiane Chaves Augusto Leite Simão, PhD^{1,2}

Mayra Zanon Casagrande¹

Katiana Vinha de Sousa¹

Rogério Baumgratz de Paula, PhD^{1,2}

1. Núcleo Interdisciplinar de Estudos e Pesquisas em Nefrologia (Niepen), Juiz de Fora (MG), Brasil

2. Faculdade de Medicina da Universidade Federal de Juiz de Fora (UFJF), Juiz de Fora, (MG), Brasil

3. Faculdade de Ciências Médicas e da Saúde de Juiz de Fora (SUPREMA), Juiz de Fora, MG, Brasil

4. Hospital Escola da Universidade Federal de Pelotas (HEUFPel), Pelotas, RS, Brasil

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SUMMARY

OBJECTIVE: To describe clinical and epidemiological profiles of patients with hypertension referred to a secondary care unit and to assess the adequacy of the referral criteria.

METHOD: This descriptive transversal study analysed 943 hypertensive patients referred to a secondary healthcare unit from September 2010 to August 2012. Clinical and sociodemographic data as well as data regarding the liaison between secondary and primary care services were collected.

RESULTS: Patients' mean age was 59±13.1 years, and 61.3% were female. Sedentary lifestyle, alcohol consumption, and smoking were observed in 80.3%, 31.1%, and 18.1% of the patients, respectively. Uncontrolled blood pressure was observed in 72.5% of the sample, and 80.1% of individuals were overweight or obese. There was a high prevalence of dyslipidaemia (73.1%), cardiovascular disease (97.5%), and reduced glomerular filtration rate (49.9%). Thirty-eight percent of patients did not meet the referral criteria, of whom approximately 25% were not hypertensive.

CONCLUSION: Even in a universal-access healthcare system, poor control of hypertension and high prevalence of obesity and cardiovascular diseases were observed. Inadequate referrals and the presence of clinical complications suggest low efficiency of the assistance provided in primary care and reinforce the need for sharing care with the secondary level.

KEYWORDS: Health services. Delivery of health care. Hypertension. Chronic disease.

INTRODUCTION

Changes in lifestyle and population aging have led to an increasing prevalence of chronic disorders such as hypertension¹. Therefore, health systems must adapt to the magnitude of this challenge, especially in developing countries that face scarcity of resources².

As in other countries, hypertension is highly prevalent in Brazil, affecting approximately 32% of the adult population³. Due to its asymptomatic nature, it is estimated that approximately 50% of hypertensive patients are unaware of the diagnosis, and among

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CORRESPONDING AUTHOR: Chislene Vanelli

Leny Lessa Carelle 230 – Juiz de Fora – Minas Gerais
Brasil – CEP 36038-012

E-mail: chisvanelli@gmail.com

monicabc@acessa.com

fcolugnati@gmail.com

heladysanders@gmail.com

elaineamp@hotmail.com

chris_caleite@hotmail.com

mayrazc@gmail.com; katyvinha@hotmail.com

rogeriobaumgratz@gmail.com

those with an established diagnosis, 65% do not receive treatment, and only 33% present adequate blood pressure control^{3,4}. Despite an unfavourable socioeconomic profile, the rates of hypertension control in Brazil are close to those of other countries^{5,6}, which can be attributed to universal access to the public health system². However, the high rates of morbidity and mortality due to cardiovascular diseases in our country point toward a need to improve the effectiveness of the health system^{1,7}.

To meet this challenge, the Brazilian Ministry of Health has proposed the reorganization of the Integrated Networks of Health Services, seeking a more efficient dialogue between primary health-care (PHC) and secondary healthcare (SHC). In the state of Minas Gerais, this proposal was implemented through the Hiperdia Minas SHC centres. These centres offer an interdisciplinary approach to hypertensive patients with high cardiovascular risk, shared with the PHC⁸. Given the scarcity of data on the operation of the health system and the data needed for future planning of treatment for severe hypertension, this study aimed to describe the epidemiological profile of patients referred from PHC to the Hiperdia Minas Centre in the city of Juiz de Fora (CHDM/JF) during the implementation phase of the centre.

METHODS

Study design and population

The study was retrospective, cross-sectional, and descriptive. All patients with a diagnosis of hypertension and high cardiovascular risk, on antihypertensive drugs, of both genders, with at least 18 years old, resident in the city of Juiz de Fora, and referred by PHC to the CHDM/JF in the first 2 years of its operation (September 2010 to August 2012) were considered eligible. Juiz de Fora city has 516,247 inhabitants, of whom 99% reside in the urban area. Of 1,190 eligible patients, 247 were excluded: 241 for living in other cities, 5 due to a lack of record of the city of residence, and 1 for being under 18 years old. Thus, 943 individuals were evaluated.

Date setting and data collection

Three researchers (C.P.V., K.V.S., and M.Z.C.) who were not part of the CHDM/JF collected the data by consultation of electronic medical charts, carried out from November 2012 to May 2014. Data

was analysed from February 2013 to August 2014. Demographic, clinical, and laboratory data was collected from the first consultation, and the diagnoses of cardiovascular disease and target-organ lesions (TOL) were collected at the first appointment or up to 3 months after entry into the program. Missing data was included in the category of “not informed/not available”, with differentiated coding for “not applicable” cases.

Epidemiological variables

The sociodemographic data encompassed age (years), gender, ethnicity (self-declared: Caucasian vs. non-Caucasian), marital status (married/stable partner vs. other), occupation (active vs. not active), family income (in multiples of minimum wage. Brazilian minimum wage references per month were US\$330.00, in 2010; US\$329.27, in January and February 2011; US\$328.31, from March to December 2011 and US\$332.62, in 2012), education level (illiterate, up to 8 years, 8 to 11 years, >11 years), practice of physical activity (direct question: yes vs. no), currently smoking (yes vs. no) and alcohol consumption (yes, in any quantity vs. no).

Clinical data

We collected systolic blood pressure (SBP) and diastolic blood pressure (DBP) measurements, and the diagnosis of hypertension was based on blood pressure (BP) $\geq 140/90$ mmHg. Blood pressure levels above these values in patients using anti-hypertensive medication were considered to indicate uncontrolled BP⁹. Obesity and/or overweight were assessed by body mass index (BMI) and abdominal obesity by waist circumference (>102 cm in men or >88 cm in women)⁹. The diagnosis of dyslipidaemia was established by one of the following criteria: triglyceride levels ≥ 150 mg/dl; LDL-c ≥ 160 mg/dl; and HDL-c < 40 mg/dl for men and < 50 mg/dl for women¹⁰. The TOL evaluated were hypertensive retinopathy, low estimated glomerular filtration rate (eGFR), and cardiovascular diseases⁹.

Estimated glomerular filtration rate below 60 ml/min/1.73 m² was considered suggestive of chronic kidney disease¹¹. Cardiovascular diseases included previous diagnosis of stroke or coronary disease; peripheral vascular disease, diagnosed by ankle-brachial index lower than 0.9; and presence of diastolic dysfunction of the left ventricle or left ventricular hypertrophy (LVH) on echocardiography.

System operation

Compliance with the referral criteria of the patient to the SHC centre was assessed in order to investigate the efficiency of the dialogue between PHC and the CHDM/JF. Referral criteria included refractory hypertension, hypertension associated with TOL, suspicion of secondary arterial hypertension, or high cardiovascular risk. Failures to complete medical records at the SHC service were also recorded.

Ethical considerations

The study was authorized by the City Health Office of Juiz de Fora, MG and approved by the Human Research Ethics Committee of the University Hospital of the Federal University of Juiz de Fora, under the number 133,399.

Statistical analysis

Categorical and quantitative variables were analysed descriptively, in strata. The results were presented as mean and standard deviation or median and 25–75 percentiles, according to normality, reviewed by the Kolmogorov-Smirnov test. Numerical variables were compared by Student's t test. For the analysis of the association between the variables, the Pearson's coefficient was used. The data was analysed using SPSS 19.0 software (SPSS Inc., Chicago, USA).

RESULTS

Sociodemographic data

Nine hundred forty-three patients were evaluated, with a mean age of 59±13.0 years and a predominance of individuals in the 41–60-year age range (46.8%), female (61.3%), and non-Caucasian (83.9%). Five hundred forty-five individuals (58.9%) were married or had a stable partner, 468 (49.7%) were not active professionally, and 308 (71.6%) had a family income of up to three times the Brazilian minimum wage, with a median of US\$667.5 (US\$54.0 - US\$4,268.3). Most patients (75.8%) had up to 8 years of education, and 80 individuals (8.5%) self-declared being illiterate. The majority of the evaluated population was sedentary (80.3%), while smoking and alcohol consumption were present in 18.1% and 31.1% of the sample, respectively (Table 1).

Clinical data

Mean SBP and DBP were 151±28.3 mmHg and

TABLE 1: SOCIODEMOGRAPHIC PARAMETERS AND RISK FACTORS IN HYPERTENSIVE PATIENTS AT FIRST CONSULTATION AT THE HIPERDIA MINAS CENTER, JUIZ DE FORA, BRAZIL, FROM SEPTEMBER 2010 TO AUGUST 2012

Variable	Mean ± SD / %*	
Agea	59±13.0	
	> 65 years old	33.9 (320/943)
Gender	Female	61.3 (578/943)
	Male	38.7 (365/943)
Ethnicityb	Caucasian	16.1 (152/943)
	Non-Caucasian	83.9 (791/943)
Marital statusc	Married/stable partner	60.2 (555/922)
	Other	39.8 (367/922)
Occupationd	Active	27.9 (181/649)
	Not Active	72.1 (468/649)
Family incomee	Less than 1 minimum wage	3.0 (13/430)
	From 1 to less than 3 minimum wages	68.6 (295/430)
	From 3 to less than 5 minimum wages	21.4 (92/430)
	More than 5 minimum wages	7.0 (30/430)
Education	Illiterate	8.5 (80/937)
	Up to 8 years	76.3 (715/937)
	From 8 to 11 years	13.3 (125/937)
	Over 11 years	1.8 (17/937)
Sedentary lifestylef		80.3 (647/806)
Tobaccog		18.1 (125/689)
Alcoholh		31.1 (229/737)
Blood pressure	Controlled (<140/90 mmHg)	27.5 (257/936)
	Uncontrolled	72.5 (679/936)
BMI (kg/m ²)a	Women	32±7.1
	Men	29±5.8
	Total	31±6.8
Nutritional status (BMI, kg/m ²)	Underweight	0.6 (06/925)
	Eutrophic	19.2 (178/925)
	Overweight	31.8 (294/925)
	Obese	48.3 (447/925)
	Above weight (overweight + obese)	80.1 (741/925)
Waist circumference (cm)a	Women	104±14.0
	Men	101±14.1
	Total	103±14.1
Abdominal obesity	Absent	14.2 (119/837)
	Present	85.8 (718/837)
Total cholesterol ≥ 200 mg/dl		49.6 (195/395)
Triglycerides ≥150 mg/dl		45.0 (170/378)
LDL-c > 100 mg/dl		66.5 (222/336)
HDL-c below reference valuei		43.2 (161/373)
Dyslipidaemia		73.1 (274/375)

Abbreviation: BMI, body mass index. *For some variables, data were not available for all 943 patients. The number in parenthesis shows the absolute number of individuals over the total available number. **a** Data are presented as mean ± SD or frequency. **b** Ethnicity: self-declared. **c** Marital Status: Married includes married or those living with a partner; Others include divorced, widowed, and single. **d** Occupation: formal employment. **e** Brazilian minimum wage per month: 2010, US\$330.00; Jan 2011, US\$329.27; Mar 2011, US\$328.31; 2012, US\$332.62. **f** Sedentary lifestyle: no practice of physical activity outside working hours. **g** Smoking: cigarettes. **h** Alcohol: consumption of alcoholic beverages at any dose. **i** Corrected HDL-c: below 40 mg/dl for men and below 50 mg/dl for women. **j** The test results were brought by patients to begin treatment at the SHC CHDM/JF program.

91±15.9 mmHg, respectively, and 679 subjects (72.5%) presented inadequate blood pressure control. Although hypertriglyceridemia was the most frequent lipid disorder (Figure 1), the median value was 138 [35-3,255] mg/dL. The mean levels of total cholesterol and LDL cholesterol were elevated, and the level of HDL cholesterol reduced. Notably, 681 (72.2%) patients did not have complete laboratory evaluation of their lipid profile at the time of admission to SHC.

The mean body mass index (BMI) was 31±6.8 kg/m² and higher in women (32±7.1 vs 29±5.8 kg/m²) ($p<0.001$). Excess weight was present in 741 individuals (79.9%), and abdominal obesity was found in 718 subjects (85.8%) (Table 1).

The correlation observed between BP control and BMI classification, education and family income were weak, with coefficient values of 0.13, -0.04, -0.07, respectively. On the other hand, the statistical significance between BP control and BMI classification, education and family income were, respectively, <0.001 , 0.20, 0.04.

Target-organ lesions

We found a predominance of CVD, followed by low eGFR. The most prevalent CVD were left ventricular diastolic dysfunction, peripheral vascular disease, and LVH (Tables 2 and 3). Two hundred twenty-four individuals (23.8%) were not evaluated in relation to all possible TOL.

System functioning

With regard to meeting the criteria for referral to the CHDM/JF, 505 patients (53.6%) were using three or more antihypertensive drugs and 191 (20.3%) had hypertension associated with prior TOL (stroke and/

or coronary disease). By contrast, 87 individuals (9.2%) were not taking any anti-hypertensive drug, and 247 (28.9%) were hypertensive without prior TOL and taking only 1 or 2 antihypertensive drugs, i.e. they did not meet the referral criteria for SHC. Laboratory tests of lipids and renal function were available in only 27.8% and 45.5% of the medical charts, respectively. On the other hand, 71.8% of the charts contained all the minimum standardized information.

DISCUSSION

In this study, high cardiovascular risk hypertensive patients referred to a SHC centre were predominantly elderly, obese, and sedentary women with dyslipidaemia and uncontrolled blood pressure levels. These characteristics are often found in hypertensive patients followed at the PHC and referred to specialized care. In addition, a high prevalence of TOL was observed.

The low socioeconomic level encountered in this study, a known limiting factor for the treatment of chronic conditions, must be highlighted, as it corroborates the data of Yusuf et al.¹² who evaluated 154,000 adults with CVD and observed that individuals of low-income countries face many challenges to accessing proper treatment for the disease.

Approximately 80% of the studied sample had excess weight, especially in the abdomen, consistent with studies showing an association between obesity and hypertension¹³⁻¹⁵. Similarly, in the study of Álvarez-Sala et al.¹⁶, 81.4% of the hypertensive patients had excess weight, while Efstratopoulos et al.¹⁷, who assessed 3,589 hypertensive patients, found 46.4% to be overweight and 35.0% obese. Epidemiological

TABLE 2: CARDIOVASCULAR IMPAIRMENT UPON ADMISSION TO THE HIPERDIA MINES CENTER, JUIZ DE FORA, BRAZIL, FROM SEPTEMBER 2010 TO AUGUST 2012

Variables	% *
Strokea	10.0 (82/822)
Coronary disease	15.3 (126/825)
Peripheral vascular diseaseb	58.1 (200/344)
Left ventricular diastolic dysfunctionc	76.1 (488/641)
Left ventricular hypertrophyc	45.6 (292/641)
Cardiovascular diseased	97.5 (657/674)

*For some variables, data were not available for all 943 patients. The number in parenthesis shows the absolute number of individuals over the total available number. **a** Stroke: prior history. **b** Peripheral vascular disease: assessed by the corrected ankle-arm index. **c** Diastolic left ventricular dysfunction and left ventricular hypertrophy: assessed by echocardiography. **d** Cardiovascular disease: showing some cardiovascular changes.

TABLE 3: PRESENCE OF TOL IN HYPERTENSIVE INDIVIDUALS UPON ADMISSION TO THE HIPERDIA MINAS CENTER, JUIZ DE FORA, BRAZIL, FROM SEPTEMBER 2010 TO AUGUST 2012

Variables	% *
Hypertensive retinopathy	1.5 (12/814)
Estimated glomerular filtration rate	49.9 (214/429)
Cardiovascular disease diagnosed after attendance at the SHC	85.6 (572/668)
TOL	75.7 (714/943)
Diagnosis before attendance at the SHC	27.0 (193/714)
Diagnosis after attendance at the SHC	73.0 (521/716)

Abbreviations: SHC, secondary health care; TOL, target-organ lesions. *For some variables, data were not available for all 943 patients. The number in parenthesis shows the absolute number of individuals over the total available number. **a**Hypertensive retinopathy: diagnosed at the Hiperdia Minas Center.

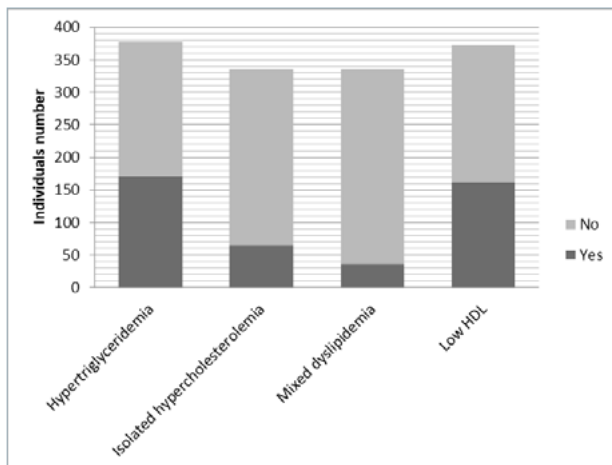


FIGURE 1: Lipid profile of studied population at the admission to SHC.

studies have reported that up to 75% of the risk for the development of hypertension may be attributed to excess weight¹⁸. Moreover, an alarming proportion of our study population was sedentary, contrasting with studies such as that by Gregg et al.¹⁹, who reported a sedentary lifestyle rate of 31.5% in a population of 3,358 hypertensive American women over 65 years of age.

Even though uncontrolled BP was one criterion for entry into the program, the very high rate of uncontrolled BP we observed is worrying. Inadequate hypertension treatment not only increases cardiovascular risk but also favours evolution to more advanced stages of the disease⁷. Accordingly, in a multicentre study that included 2,649 individuals at high cardiovascular risk treated in PHC, it was found that 60% of sample had inadequate hypertension control¹⁶. Despite universal access to the health system, findings of inadequate blood pressure control coupled with sedentary lifestyle, overweight, and obesity at entry into SHC point to a low effectiveness of the management of chronic conditions in PHC^{1,18-21}.

Taking into account the characteristics of this population, risk stratification is crucial for referring individuals at high cardiovascular risk to SHC²². However, the high percentage of individuals referred to SHC without assessment of their lipid profile hampers the stratification of cardiovascular risk in the various levels of the healthcare network (HCN). This strategy is essential in SHC to reduce morbidity and mortality in individuals whose cardiovascular risk is often underestimated^{22,23}.

In addition, the finding of a high prevalence of

TOL, especially left ventricular diastolic dysfunction and LVH, is compatible with inadequate control of hypertension^{7,24}. In parallel, two-thirds of the patients were diagnosed with peripheral vascular disease, a condition associated with a higher risk for coronary disease²⁵. Regarding chronic kidney disease, in a 13-year follow-up study of 281 patients with severe hypertension, Segura et al.²⁶ found that 15% of patients had reduced eGFR due to hypertensive nephrosclerosis. Other authors, in different populations, have emphasized the close relationship between hypertension and risk for chronic kidney disease^{27,28}, which in turn is associated with high cardiovascular risk²⁹. In our sample, we found that 50% of patients had a reduced eGFR. However, this study is not prospective and does not reflect the care at the SHC level, but rather the state of health of hypertensive patients referred from PHC. The higher prevalence of individuals with reduced eGFR observed in this study could be justified by the fact that we evaluated a population with severe hypertension, involving resistant or secondary hypertension and high cardiovascular risk.

The high blood pressure levels and lack of laboratory evaluation of dyslipidaemia in conjunction with high prevalence of obesity and sedentary lifestyle point to the low effectiveness of interventions at the PHC level, suggesting that compliance with clinical guidelines has not received adequate attention in the HCN, resulting in impaired care of patients with hypertension³⁰. This weakness in patient care is consistent with a previous study conducted by our group, in which we found that 43% of PHC physicians do not follow clinical guidelines and/or do not know the criteria for forwarding to SHC services, which can result in inappropriate referral to SHC³¹. In parallel, in the SHC, we observed incompleteness of a large number of medical records, suggesting that this tool, indispensable for monitoring and risk stratification of patients with hypertension, also did not receive proper attention from PHC professionals. In this context, the study of Flink et al.³² also points to a lack of important information for the proper care of patients with chronic health conditions in the context of the HCN. Moreover, according to Paes et al.³³, the assessment of health services quality is crucial for adherence to treatment, doctor-patient relationship and appropriateness in the use of services.

The present study presents limitations such as

lack of basic information in the medical records, which created difficulties in the stratification of cardiovascular risk. Furthermore, the non-inclusion of patients from other cities did not allow the comparison between different PHC services. On the other hand, this study adds information in this field and may be useful for the development of policies to improve healthcare systems.

CONCLUSION

In conclusion, our study showed that in hypertensive patients referred to SHC, inadequate blood pressure control, a high prevalence of TOL and inadequate referral practices point to the ineffectiveness

of treatment and to the weaknesses in the dialogue between the different levels of the HCN. These findings reinforce the importance of improving the HCN effectiveness in order to decrease morbidity and mortality secondary to inadequate treatment of hypertension.

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RESUMO

OBJETIVO: Descrever os perfis clínicos e epidemiológicos de pacientes hipertensos encaminhados para uma unidade de atendimento secundário e avaliar a adequação dos critérios de referência.

MÉTODO: Estudo transversal que analisou 943 pacientes hipertensos encaminhados a uma unidade de atenção secundária à saúde de setembro de 2010 a agosto de 2012. Foram coletados dados clínicos e sociodemográficos, bem como dados de interlocução entre os serviços de atenção primária e secundária.

RESULTADOS: A idade média dos pacientes era de $59 \pm 13,1$ anos e 61,3% eram do sexo feminino. O estilo de vida sedentário, o consumo de álcool e o tabagismo foram observados em 80,3%, 31,1% e 18,1% dos pacientes, respectivamente. A pressão arterial descontrolada foi observada em 72,5% da amostra, e 80,1% dos indivíduos apresentavam excesso de peso. Houve uma alta prevalência de dislipidemia (73,1%), doença cardiovascular (97,5%) e taxa de filtração glomerular estimada reduzida (49,9%). Trinta e oito por cento dos pacientes não atendiam aos critérios de encaminhamento, dos quais aproximadamente 25% não eram hipertensos.

CONCLUSÃO: Mesmo em um sistema de saúde de acesso universal, observou-se um controle insuficiente da hipertensão e uma alta prevalência de obesidade e doenças cardiovasculares. Encaminhamentos inadequados e a presença de complicações clínicas sugerem uma baixa eficiência da assistência prestada na atenção primária e reforçam a necessidade de compartilhar cuidados com o nível secundário.

PALAVRAS-CHAVE: Serviços de saúde. Assistência à saúde. Hipertensão. Doença crônica.

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