Therapeutic Inertia and Control of High Blood Pressure in Primary Health Care Units

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Abstract

Background: The importance of adequate management and control of high blood pressure (HBP).

Objective: To estimate the prevalence of hypertension control and therapeutic inertia among adults treated at primary health care units (PHCU) in the city of Joinville, as well as the associated factors.

Methods: A cross-sectional study, which included cluster sampling and analysis of medical records, with the evaluation of 415 patients with high blood pressure. We evaluated the blood pressure (BP), increments of therapy, risk factors and comorbidities.

Results: There was prevalence of females and nursing appointments. The age ranged between 28 and 90 years (mean of 61.5 years). There was a reduction in the mean BP (155.8 ± 20.8/95.7 ± 10.6 mmHg to 140.3 ± 22/84.1 ± 12.4 mmHg) between the first and last record and the final normal BP in 36.6% of patients, with similar results for men and women. Over the past 12 months, the BP was high on 1,295 occasions, and there was a therapeutic increment on only 156 occasions (12.0%). 1.85 drugs were used per patient, mainly diuretics and ACE inhibitors. There was high prevalence of obesity (40%), diabetes (41%), high LDL (46%) and left ventricular hypertrophy (25.5%).

Conclusion: The high therapeutic inertia, low control of high blood pressure and the large number of comorbidities suggest the need for continuing education programs for health professionals and other measures to improve the disease control in primary health care units. (Arq Bras Cardiol 2010; 95(2): 223-229)

Key words: Inertia; hypertension/control; comorbidity; health education; health centers; Joinville (SC); Brazil.

Introduction

In developing countries, high blood pressure (HBP) is the second risk factor for morbidity and mortality among adults, second only to alcohol[1]. High blood pressure is a risk factor for cerebrovascular, cardiac, renal, aortic and peripheral arterial diseases, but the treatment significantly reduces the risk of complications[2-6] However, despite the existence of effective and safe treatments, the control is still below desired levels[7-15].

The guidelines on hypertension are an important tool to increase control and reduce the impact of the disease, in all health care levels[16,17]. The Brazilian Society of Cardiology, together with other organizations, has published guidelines since 1991, with the purpose of preventing improper conduct in health care services and providing the best option for diagnosis and treatment, based on scientific evidence.

High blood pressure is a priority of care in SUS (National Unified Health System) due to its high prevalence in adults, in addition the fact that it is a condition that is high blood pressure is a priority of care in SUS (National Unified Health System) due to its high prevalence in adults[7,9,12-15], in addition the fact that it is a condition that is highly sensitive to ambulatory care[18]. Preventive measures such as the incentives to do physical exercises, to improve eating habits and to reduce weight and smoking are also used for treatment [16,17]. With respect to drug therapy, there are many drugs available whose efficiency has been confirmed in large studies[2-6,19]. The control of the disease depends on ensuring that proper actions are taken by institutions and by health professionals, and on ensuring that patients will follow the recommendations. SUS offers wide and free access to health care professionals and medicines, especially in primary health care units (PHCU), but SUS has some difficulty in offering expert care. The purpose of this study is to evaluate the control of high blood pressure in PHCU's of SMS (Municipal Health Office) of Joinville City, Santa Catarina State.

Methods

This is a cross-sectional study that includes a retrospective analysis of charts of patients with high blood pressure, registered with Joinville's SMS. Patients were selected by random cluster sampling in two stages, but each PHCU

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formed one cluster. In the first stage, fourteen PHCUs (25%) out of fifty-six were selected, including conventional care units (five) and family health strategy units (nine), covering the nine regional health sections of the municipality. In the second stage, patients from each PHCU were selected by systematic random sampling, with probability proportional to the number of users that belong to the unit. We randomly selected the final digit of the patients' chart, from zero to nine, including all with the same final digit, in the sequence of registration at the unit. When the patient did not meet the inclusion criteria, he was replaced with the following patient and so on, until the amount specified for that PHCU was obtained. The inclusion criteria were: men and women, over the age of 18, suffering from high blood pressure who had been monitored for at least the past twelve months (ending by January 1, 2007), who had paid at least two visits to a doctor and/or nurse in 2007, in which there were blood pressure measurements.

The calculation of the sample was based on 27,000 users registered at the SMS's Department of Pharmaceutical Care[20], as well as on the expected prevalence of hypertension control in 30% of such users, with desired precision of 0.05 and a confidence level of 95%, which resulted in the minimum number of 319 patients.

The analysis of medical records included the patients' demographic characteristics, such as gender, age and PHCU of origin, and the presence of cardiovascular risk factors and comorbidities such as smoking, physical inactivity, obesity, family history of cardiovascular disease, left ventricular hypertrophy (LVH), coronary artery disease (CAD), heart failure (HF), cerebrovascular accident (CVA), peripheral artery disease and chronic kidney disease (CKD). Risk factors and comorbidities were identified by checking the patients' medical records or by looking at reports of supplemental tests. The social and economic characteristics were not included, because they had not been included in the patient's chart/records.

The hypertension monitoring was calculated in months, counting from the first appointment for high blood pressure at the PHCU until the month of January 2007, and we evaluated the values of the systolic blood pressure (SBP) and diastolic blood pressure (DBP) at the beginning of the treatment (initial BP), at the beginning and at the end of 2007 (final BP 1 and 2). For this study, BP was considered to be normal, when the SBP recorded was <140 mmHg and when the DBP recorded was below 86 mmHg (130/80 mmHg in cases of DM and CKD) in the last appointment in 2007. The high blood pressure was considered to be controlled when all BP measurements made in 2007 revealed that the BP levels were normal. To calculate the therapeutic inertia, we used the records of high BP and change in drug therapy made in 2007.

In 2007, we evaluated the number of visits to nurses and to doctors, blood pressure measurements, changes in therapy (dose or combination) and supplemental testing (blood glucose, triglycerides, cholesterol and fractions, creatinine, potassium, partial urine and electrocardiogram). We quantified the drugs used in the treatment, which were identified as diuretics, beta-blockers (BB), calcium channel blockers (CCB), angiotensin-converting enzyme inhibitors (ACEI) and others. Then, we quantified the number of daily doses.

The data were analyzed by using SPSS 12.0. Categorical variables were expressed as absolute and relative frequencies, mean and standard deviation. To analyze the differences between the groups, we used the chi-square test, for categorical variables, and the Student's t-test and Kruskal-Wallis test for continuous variables. We used the significance level of 5% (95% CI for the prevalence studied).

The research project was approved by the Ethics Committee of the Regional University of Joinville (UNIVILLE) and it was approved by the Management of the Primary Health Care Units of SMS.

Results

Seven hundred and fifty-four (754) patient records were analyzed. 339 of them were excluded, 20% of which were excluded due to the absence of high blood pressure. Thus, the sample consisted of 415 individuals, predominantly female, mean age 61.5 ± 11.6 years (28 to 90 years) for men and women. The treatment period ranged between 12 and 324 months (mean of 75.4 ± 49.3 months). Out of the 415 patients, 22 (5.3%) paid visits only to nurses, and 19 (4.6%) paid visits only to doctors in 2007. Visits to a nurse (mean of 3.6 ± 2.8, from 0 to 18, up to 5 in the 75th percentile) prevailed over visits to physicians (2.6 ± 1.9, from 0 to 17, until 3 in the 75th percentile).

2082 measurements of BP were made (up to six in the 75th percentile) and, in 1295 (62.2%) measurements, the BP level was abnormal (0 to 19, mean of 3.1 ± 2.9), with only 53 patients (12.8%, mean of 3.6 measurements) with no record of high BP in 2007. When the doctors found high levels of blood pressure, they made changes to the therapy in 156 cases (12.0%), favoring 122 (29.5%) of the hypertensive patients, by altering the number of drugs or doses, with 103 patients having benefited from one change. The treatment caused significant reductions in SBP and DBP (Table 1). In the last measurement, the SBP and DBP were normal in 41.6% and 57.5% of patients, respectively, with both SBP and DBP at normal levels in 36.6% of patients.

Supplemental tests recommended for annual evaluation were requested for 72% of patients.

In the patients' medical records, there were no notes indicating the stage of the hypertension and target organ damage, as recommended by the hypertension protocol of

Table 1 - Temporal evolution of blood pressure in patients with high blood pressure (n = 415)

Variables	Variation (mmHg)	Mean/SD
Initial SBP	100 to 220	155.8 ± 20.8
Final SBP 1	100 to 240	139.5 ± 20.8
Final SBP 2	80 to 220	140.3 ± 22
Initial DBP	60 to 140	95.7 ± 10.6
Final DBP 1	50 to 160	85.5 ± 13.3
Final DBP 2	60 to 120	84.1 ± 12.4

1- first measurement in 2007, 2- last measurement in 2007.

SMS, for classification and monitoring of patients.

With respect to associated risk factors, it was not possible to determine the prevalence of the sedentary lifestyle or family history of cardiovascular disease, due to the scarceness of information in the medical records. There was prevalence of obesity or overweight, diabetes and high LDL-C, all above 40%, followed by the hypertriglyceridemia, low HDL-C and smoking. Among the complications, there was prevalence of LVH, followed by CAD (coronary artery disease), stroke and CKD, with a low prevalence of CI and peripheral arterial disease. A positive association with continuation of high BP was noted only for LVH (Table 2).

In the distribution of the several variables, such as demography, clinical monitoring, number of drugs used in the treatment and comorbidities among patients whose final BP was normal or high, there was a significant difference only for therapeutic increments (Table 3).

There were no significant differences between men and women, both with 36.6%, or between family health strategy PHCUs and conventional PHCUs (38.6% and 34.7%, p = 0.461), in the distribution of patients with normalized final BP. In the drug treatment, there was greater use of diuretics (72.4%) and ACEI (70.5%), followed by BB (29.4%), CCB (14.5%) and 5% with other drugs. There was no significant variation between the number of drugs (1.7±0.8 and 1.8±0.8) and doses (3.3±2.1 and 3.8±2.3) used in the beginning and at the end of 2007. No comparisons were drawn between monotherapy and combination therapy.

Table 3 - Distribution of monitoring, comorbidity and demography characteristics among hypertensive patients whose final BP was normal or high

Variables	Normal BP (n = 152)	High BP (n = 263)	p
	Mean/SD	Mean/SD	
Age (years)	60.2 ± 11.8	62.3 ± 11.5	0.083*
Treatment (months)	78.2 ± 53.9	73.8 ± 46.4	0.395*
Visits to a physician	2.6 ± 1.7	2.6 ± 1.9	0.418
Visits to a nurse	3.6 ± 3.0	3.5 ± 2.7	0.757
BP measurements	5.0 ± 3.5	4.9 ± 3.4	0.754
Changes in treatment	0.26 ± 0.5	0.44 ± 1.0	0.018
Initial drugs	1.6 ± 0.7	1.7 ± 0.8	0.469
Final drugs	1.7 ± 0.7	1.9 ± 0.8	0.158
Risk factors (total)	1.7 ± 1.3	1.8 ± 1.2	0.332
Comorbidities (total)	0.4 ± 0.7	0.5 ± 0.7	0.336

** T test.*

Discussion

Despite evidence that confirms the impact of the hypertension treatment in reducing morbidity and mortality[2-6], the disease control is poor in most places. Wolf-Maier[10] evaluated large national studies conducted in seven countries, between 1990 and 2000, comparing the prevalence, treatment and control. The lowest levels of treatment, below 32%, were found in England, Sweden, Germany, Spain and Italy. In Canada and the United States, 36% and 53% of the hypertensive patients, respectively, were under treatment. The control of the disease was below 10% in European countries, in contrast to 17% in Canada and 29% in the United States. The HYDRA study[11], which was conducted in Germany with patients monitored in Primary Health Care (PHC), revealed treatment and control of hypertension in 64% and 19%,

Table 2 - Distribution of comorbidities among hypertensive patients whose final BP was normal or high

Variables	Total (n = 415)		Normal BP (n = 152)		High BP (n = 263)		p
	N	%	N	%	N	%	
Obesity	167	40.2	57	37.5	110	41.8	0.446
Diabetes	172	41.4	64	42.1	108	41.0	0.917
Smoking	37	8,9	15	9,8	22	8,3	0,734
LDL cholesterol	192	46.2	63	41.4	129	49.0	0.163
HDL cholesterol	51	12.3	18	11.8	33	12.5	0.955
Triglycerides	120	28.9	42	27.6	78	29.6	0.744
LVH	106	27.5	29	19.0	77	29.2	0.029
CAD	29	7.0	11	7.2	18	6.8	0.961
HF	7	1.7	2	1.3	5	1.9	0.959
CVA	30	7.2	14	9.2	16	6.0	0.322
CKD	28	6.7	9	5.9	19	7.2	0.758
PAD	9	2.2	5	3.2	4	1.5	0.297*

*LVH - left ventricular hypertrophy; CAD - coronary artery disease, HF - heart failure, CVA – cardiovascular accident (stroke); CKD - chronic kidney disease; PAD – peripheral arterial disease * Fisher's exact test.*

respectively. A Spanish study[8] involving 29,148 patients evaluated by ambulatory blood pressure monitoring (ABPM), in PHC, the control rate was below 16%.

In Cienfuegos, Cuba, a cross-sectional study[21] was conducted in 2001-2002 with a sample of 1,475 men and women, aged between 25 and 74. The study is part of the CARMEN project, from the Pan American Health Organization. The technical staff was trained for the job. The BP measurements were made in clinics and were repeated at intervals of one minute. A sign of the work quality was the fact that more than 75% of the BP measurements had a final digit other than zero. In our sample, only one physician showed such records of the BP. The blood pressure was controlled in half of the women and 39.9% of hypertensive patients. Only 21.5% of hypertensive patients were unaware of the presence of the disease, mostly young men. The hypertension control rate is remarkable and it is probably related to the accessibility and gratuitousness of health services.

Some Brazilian studies have shown rates of hypertension control. Among such studies, it is possible to mention Souza[14], who found, in the city of Campo Grande, State of Mato Grosso do Sul, the treatment of 57.3% and control in 39.5%; Pereira[13], who found, in the city of Tubarão, State of Santa Catarina, 10.1% of control among 46.8% of hypertensive patients undergoing treatment; and Gus[15], in the State of Rio Grande do Sul, who found control in 10.4%. Even in specialized services, the control rates are below desired levels, as reported by Barbosa[22] and Freitas[23], who found, in centers of cardiology and nephrology, less than 25% of hypertensive patients being controlled. This study shows normal final BP in 36.6% and control in 12.8% of treated individuals, without any differences between conventional PHCUs and family health strategy (FHS) PHCUs, contrary to expectations of better results in FHS PHCUs, due to the supposedly closer relationship of the professionals with the community.

There are different causes for insufficient control, including the fact that a significant share of people that have the disease are unaware of such disease[7,9,13-15,21], as well as the lack of adherence to treatment[24] and the improper management of the treatment by health professionals[25-27]. Wang and Vasan[27], in a review article, mention obesity, sedentary lifestyle and old age as causes related to the patients. The prevalence of obesity in this study is very high, but no record of sedentary lifestyle was found in the patients' medical records.

Tests with several classes of drugs, as well as epidemiological studies, show that the proper treatment of hypertension allows reducing the complications in a few years[5,6]. The reduction in cases of stroke is around 33% to 50% in the clinical trials and 35% to 40% in the epidemiological studies. The reduction in the rates of coronary disease is between 4% and 22% in the clinical trials and between 20% and 25% in the epidemiological studies[6]. It is possible to prevent one death in every eleven hypertensive patients treated, with reduction of 12 mmHg in blood pressure and simultaneous treatment of another risk factor[17]. In the sample analyzed here, we found a high prevalence of complications (35%), which is a fact that increases the importance of a proper hypertension treatment. The high prevalence of diabetes suggests the existence of a selection bias, in PHCUs, towards monitoring patients with more severe diseases. However, a study conducted by Cabral in 2005-2006 in Joinville, with patients that had suffered a stroke, also revealed a high prevalence (26.9%) of DM[28].

The tests with drugs show that it is possible to reach normal levels of BP in a large number of participants[2,3,5,6,19,29]. In the ALLHAT study[19], after four years of monitoring, BP was controlled in 72% of white Latin Americans and in 69% of Afro-Latin Americans. In CONVINCE[29], the control was kept throughout the two years of the research, in 69% of the participants. The HOT trial[3] showed that the lowest levels of cardiovascular events occurred with DBP below 85 mmHg. This raises the question: why are high levels of hypertension control achieved only in clinical trials? Several studies suggest that a significant portion of the responsibility for the problem lies with the behavior of physicians. Berlowitz et al[25], in a study conducted between 1990 and 1995, evaluated the care provided to 800 hypertensive men, who were monitored in New England. They found that approximately 40% of the patients maintained the BP above 160/90 mmHg, despite an average of six appointments/visits per year. Increments in therapy occurred in less than 7% of the visits. It was concluded that many physicians have a complacent attitude towards hypertension care. When the study was repeated in 1999[26], 18% of patients maintained the blood pressure above 160/100 mmHg, and 57% above 140/90 mmHg. Another study carried out in primary health care[29], by reviewing the medical records of patients that were not controlled, showed changes in therapy in only 38% of the visits[30]. The present study demonstrates that there is little control of the disease and that professionals working in PHCUs miss many opportunities to intensify the treatment of patients.

Phillips e al[31] point to the biomedical model, which focuses on the relief of symptoms, as a cause of failure in the management of hypertension. The authors mention the so-called "therapeutic inertia," i.e., the failure of health professionals to initiate or intensify a therapy when this is indicated. For them, the therapeutic inertia results from three problems: overestimation of care provided; use of "weak" reasons to avoid the intensification of treatment and gaps in education, in training and in the organizational practice intended to achieve therapeutic goals. Hyman and Pavlik[32] sent questionnaires to 1,200 PHC doctors, with the purpose of getting to know the practices related to the treatment of hypertension. They found that between 25% and 43% of physicians only initiated or intensified the treatment of hypertension when the DBP exceeded 95 mmHg or the SBP exceeded 160 mm Hg.

The guidelines on hypertension[16,17] are one of the tools used to bridge gaps in medical knowledge. However, PHC doctors and general practitioners are often unaware of the guidelines, which are usually directed at cardiologists and nephrologists. A study conducted in Brazil[33], in 2004, revealed that only 42.7% of physicians had received the IV Brazilian Guidelines on Hypertension. Hyman and Pavlik[32] noted that 49% of PHC physicians did not know the American guidelines. In Joinville, in a recent study, it was found that 36.8% of PHC doctors did not know the Brazilian guidelines. At other times, doctors know the guidelines, but they adhere only partially to the recommendations[26,29,32,34]. Some of the

justifications for the partial adherence are: more time to monitor the BP; satisfaction with the levels achieved in the treatment, even when such levels are high; consideration that the guidelines are restrictive and have exaggerated goals; alleged late side effects of drugs and reduced quality of life due to the treatment. A Spanish study[34], which analyzed the implementation of the European guidelines, described the difficulties found for wide acceptance. According to the study that analyzed interviews with 2,841 physicians, general practitioners are sometimes suspicious of the intentions of the pharmaceutical industry and the results of pharmacological tests. The differentiated knowledge and deep-rooted practices also hinder the implementation of the guidelines. For the respondents, the guidelines facilitate the stratification of the global cardiovascular risk and the selection of the best therapy for each patient, but there is no consensus that the recommendations will result in better control of hypertension, or in fewer future complications. In a recent critical review[35], even specialists, such as Zanchetti, Grassi and Mancia, considered that the evidence for some of the recommendations of the main guidelines was limited.

Despite the controversy, there has been an increase, in the last decade, in the diagnosis[7,9,36], treatment and control[7,9,36,37]. In the United States[7], between 1994 and 2004, there was an increase in the number of hypertensive individuals under treatment, from 53.1% to 61.4%, and hypertensive patients under adequate control, from 26.1% to 35.1%. In England[9], the control rates doubled between 1994 and 2003, and there was an increase in the number of hypertensive patients taking two or more drugs (56%). The Canadian Hypertension Education Program (CHEP)[36,37] began in 1999. Since the first years of its implementation, it caused a large increase in diagnoses and treatment. By 2003, the number of individuals diagnosed with hypertension grew by 65.1%, and the number of individuals being treated increased by 77%. There was a reduction in the annual number of deaths caused by stroke, HF, and AMI and a significant decrease in hospitalization for stroke and HF, comparing the periods before and after 1999. The percentage of hypertensive individuals diagnosed and untreated decreased from 31.47 to 15.34. Cabral et al[38] compared the 1995 findings with those of 2005/06 and they noticed a reduction in the incidence (27%) of stroke in Joinville, which suggested an improvement in primary prevention.

It was noted that some actions recommended by the protocol of SMS[20] are inadequately implemented by health professionals. Some of the problems mentioned included the frequent presence of the final zero digit in the pressure measurement record, the rare record of sedentary lifestyle and family history, insufficient requests for supplemental tests and no record of classification of hypertension and target organ damages. The last ones are necessary for scheduling appointments and for stratification of risks to patients. The absence suggests that, in the working process of the healthcare team, there are no criteria to prioritize the care of patients whose condition is most serious and those that are more likely to suffer from hypertension complications.

Probably, there is a significant portion of the population that does not seek or does not have access to services provided by PHCUs, which prevents the diagnosis of hypertension. Another portion already diagnosed may have been excluded from the system. The high percentage of comorbidities suggests a late diagnosis and inadequate treatment of hypertension. Among hypertensive patients, many were not included in the study because of inadequate monitoring. In the group studied, there was a significant reduction in mean pressure levels. However, most patients continue to have no control of the disease, and there is evidence of significant therapeutic inertia. The patients' medical records have forms that are appropriate for recording the patients' information in a well structured way. However, they are not used by the professionals. This is a fact that limits the quality of the records and of our study. There may be more hypertensive patients that have received an additional drug or non-drug treatment, without the proper registration. The lack of adherence to treatment may have been discovered, but maybe it was not recorded, and the previous therapy may have been maintained. Just as the therapeutic inertia may be overestimated, the comorbidities may be underestimated. As a result of the inclusion criteria, the sample does not represent the totality of hypertensive individuals being monitored in PHCUs.

A review of the world literature[36,37,39,40] suggests that continuing education programs that use multiple teaching tools and training, tailored to local conditions and which involve students, residents, physicians and other health professionals are likely to be successful. Easy access to medical specialists, multidisciplinary care and administrative interventions are also important to improve the control of the disease[16,21,36,37,39,40].

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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Study Association

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