Prevalence of True Hypertensive Crises and Appropriateness of the Medical Management in Patients with High Blood Pressure Seen in a General Emergency Room

Francisco das Chagas Monteiro Júnior, Fernando Antônio Costa Anunciação, Natalino Salgado Filho, Genise Mayara Alves da Silva, José Bonifácio Barbosa, Pedro Antônio Muniz Ferreira, Joyce Lages, Natália Ribeiro Mandarino, Wellington Santana da Silva Júnior, Carolina Cipriano Monteiro

Universidade Federal do Maranhão, São Luís, MA - Brazil

Summary

Background: **High blood pressure is a common reason for patients to seek an emergency room, and many of them may possibly be wrongly diagnosed with hypertensive crisis and, consequently, be inappropriately treated.**

Objective: **To analyze the cases of patients seen in a general emergency room because of high blood pressure as for meeting the criteria for the diagnosis of hypertensive crisis and the appropriateness of medical management.**

Methods: **Of the 1012 patients consecutively seen in a private referral general emergency room in the city of São Luís, State of Maranhão, between August and November 2003, 198 (19.56%) had a main diagnosis of high blood pressure in that visit. Of these, proper information could only be obtained from the patient charts of 169 patients; 54.4% of them were females with a mean age of 53.3 ± 15.2 years. Data regarding patients and the attendant physicians were collected, and each case was classified as an urgency, emergency or pseudohypertensive crisis; the medical management was classified as appropriate or inappropriate. We also sought to identify the factors associated with the medical management and with the use of antihypertensive medication.**

Results: **Criteria for the characterization of a hypertensive crisis were present in only 27 patients (16%), and all were classified as urgencies. Medical management was considered appropriate in 72 cases (42.6%), and was neither influenced by specialty (p=0.5) nor by the physician's experience (p=0.9). Blood pressure levels, but not the presence or absence of symptoms, were predictive of the use of antihypertensive medication (p<0.001).**

Conclusion: **In the population analyzed, less than one fifth of the patients seen in an emergency room with a presumed hypertensive crisis met defined criteria for this diagnosis. Medical management was considered appropriate in less than half of the occurrences. (Arq Bras Cardiol 2008; 90(4): 247-251)**

Key words: **Hypertensive crisis, diagnosis, prevalence, medical management.**

Introduction

Systemic hypertension is a highly prevalent disease, affecting approximately 15 to 20% of the adult population, and is considered one of the major cardiovascular risk factors. Despite the notable advances that have occurred in the past decades regarding its treatment, the rates of adequate control of hypertension are still very low in several countries, including Brazil, and patients commonly seek emergency rooms because of high blood pressure, usually due to an inadequate outpatient control, thus not necessarily characterizing a hypertensive crisis[1-3].

A hypertensive crisis is defined as an acute and symptomatic elevation of blood pressure requiring immediate reduction in order to avoid acute target-organ damage and death[4]. Although theoretically simple in practice, the management of hypertensive crises has been object of many controversies related mainly to the correct diagnosis and to the definition of emergency and urgency, as well as to the choice of an appropriate treatment and its correct use within the different settings in which the crises occur. This assumes greater importance when we consider that the correct diagnosis and appropriate treatment are able to prevent the serious complications resulting from this medical condition. However, it has been verified that many times the recommendations of international organizations have not been effectively followed in the clinical practice. In addition, information regarding the prevalence of and medical care conditions for hypertensive crises[5] are scarcely available in our midst.

The lack of standardization on the diagnosis and treatment of hypertensive crises is commonly seen in many health care services. This situation is aggravated because the diagnosis is

Mailing address: Francisco das Chagas Monteiro Júnior •
Rua Santa Luzia, 27 Qd.17, Calhau, 65.067-460, São Luís, MA - Brazil
E-mail: francchagas@cardiol.br
Manuscript received July 02, 2007; revised manuscript received August 19, 2007; accepted October 09, 2007.

frequently omitted in the presence of a concomitant clinical situation, which makes it difficult to estimate the actual prevalence of hypertensive crises. On the other hand, in situations characterized as pseudohypertensive crises, the use of medications and precipitous fall in blood pressure may be harmful to the patient[5].

In light of the magnitude of the clinical and epidemiological variables involved in the management of hypertension, and especially of hypertensive crises, we found that this study was timely, in the sense of demonstrating the real prevalence of the problem in our midst, and how physicians are dealing with this clinical situation.

Methods

This is a cross-sectional descriptive analytical study including adult patients (age ≥18 years) of both genders consecutively seen in a private general referral emergency room in the city of São Luis, State of Maranhão, between August and November 2003, whose main diagnosis in that visit was hypertension or one of its acute complications (acute pulmonary edema, aortic dissection, stroke, and others). Patients whose patient charts did not contain minimal clinical information to allow case classification and analysis of the medical management were excluded from the study.

Data regarding the patients and medical management were collected from the patient charts, and we sought to classify each case as an urgency, emergency, or pseudohypertensive crisis, and the medical management as appropriate or inappropriate. The physicians on duty in the Service were fully in charge of the information noted down on the patient charts and of drug prescription, and they were not aware of the study that was being conducted. Data were collected during all shifts of the emergency room previously mentioned. Information regarding attendant physicians (specialty and time after graduation) was obtained with the Human Resources Service of the Institution where the study was conducted.

The following variables were analyzed: gender, age, case classification (urgency / emergency / no hypertensive crisis), blood pressure (BP) levels at admission, presence of symptoms, medical management (appropriate / inappropriate), attendant physician's specialty (cardiologist / non-cardiologist), physician's practice time after graduation (shorter than 10 years / equal to or longer than 10 years), and use of antihypertensive medication.

According to the pressure levels, hypertension was classified as: mild or stage I (blood pressure ≥ 140 x 90 and < 160 x 100 mmHg); moderate or stage II (blood pressure ≥ 160 x 100 and < 180 x 110 mmHg); and severe or stage III (blood pressure ≥ 180 x 110 mmHg). Hypertensive crisis was defined according to Mesquita[6] criterion as a significant and symptomatic blood pressure elevation (generally equal to or higher than 180 x 110 mmHg), and was classified as an emergency if imminent life threat or loss of organic function were present, and as an urgency in the absence of these risks. The medical management was considered appropriate when the physician had prescribed antihypertensive medication in light of hypertensive crises (oral/sublingual for urgencies and intravenous for emergencies) and had not prescribed it in the lack of criteria characterizing a true hypertensive crisis.

Statistical analysis of the data collected was made with the Stata version 6.0 program, using the chi-square test for the comparison of proportions; p values < 0.05 were considered significant. Categorical variables were expressed as absolute (n) and relative (%) frequencies and continuous variables were expressed as means and standard deviation.

Results

The chief complaint of 198 (19.5%) out of the 1012 patients seen in the Service during the study period was high blood pressure. Of these, 169 met the inclusion criteria (corresponding to a loss of 14.65% of the total) and comprised this study sample. The mean age was 53.3 ± 15.2 years, and 92 patients (54%) were females.

The complaints most frequently attributed to high BP were headache (54.4%), dizziness (22.4%) and chest pain (28.4%). Other symptoms such as nervousness, nausea, blurred vision, malaise and bodily pain were less frequently reported, totalling 35.5% of the cases.

In only 27 patients (16%) criteria for the effective characterization of a hypertensive crisis were verified, and all were classified as hypertensive urgencies. The mean baseline systolic BP was 160.2 ± 24 mmHg, whereas the mean diastolic BP was 97.9 ± 13.9 mmHg. Only 59 patients (34.9%) presented with BP equal to or higher than 180 x110 mmHg. The frequency of patients in each BP range (systolic and diastolic) is shown in Table 1.

As regards the medical management, it was considered appropriate in only 71 cases (42%). No correlation was found between medical management (appropriate / inappropriate) and medical specialty (cardiologist / non-cardiologist) (Table 2).

No correlation was demonstrated between management and the attendant physician's practice time after graduation either (Table 3).

Table 1 - Distribution of patients according to the baseline ranges of BP levels.

Ranges of BP levels (mmHg)	Nº of patients	Frequency
Systolic BP		
130-139	27	15.9%
140-159	22	13.0%
160-179	61	36.1%
≥ 180	59	34.9%
Diastolic BP		
85-89	31	18.3%
90-99	22	13.0%
100-109	60	35.5%
≥ 110	56	33.1%

Table 2 - Relationship between attendant physician's specialty and appropriateness of management.

Specialty	Appropriate management (nº of patients)	Inappropriate management (nº of patients)
Cardiologist	39 (23.0%)	49 (28.9%)
Non-cardiologist	32 (18.9%)	49 (29%)

p = 0.5

Table 3 - Relationship between attendant physician's practice time after graduation and appropriateness of management.

Time after graduation	Appropriate management (nº of patients)	Inappropriate management (nº of patients)
< 10 years	24 (14.2%)	34 (20.1%)
≥ 10 years	46 (27.2%)	65 (38.4%)

p = 0.99

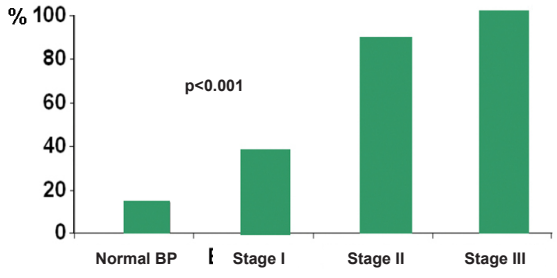
The medications most frequently used at the baseline visit were sublingual captopril (112 patients) and sublingual nifedipine (24 patients) (Graph 1).

The study also demonstrated that the use of antihypertensive medication was correlated with blood pressure levels (p<0.001) (Graph 2), but not with the presence or absence of symptoms (p= 0.72) (Graph 3).

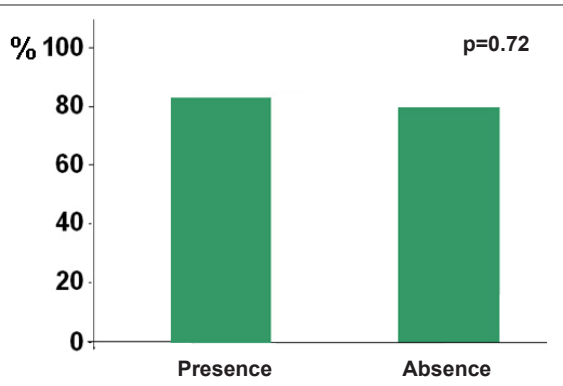
Discussion

Complaint of high blood pressure as the reason to seek an emergency service was relatively frequent in this study, and corresponded to almost 20% of all visits, thus corroborating the findings of other authors[5,7,8].

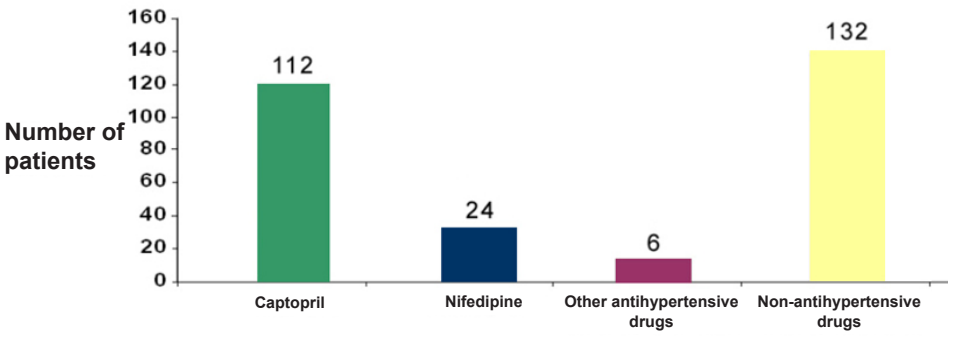
Our findings, like those of Nobre et al[8], also demonstrate a relatively high frequency of patients who are admitted to an emergency room and are inappropriately diagnosed with hypertensive crisis. In this study, only a minority of patients (16%) met the criteria for the diagnosis of a true hypertensive crisis, and no case of hypertensive emergency was recorded. However, it is worth pointing out that almost 15% of the patients initially eligible for the study were excluded due to inadequate documentation in the patient charts.



Graphic 2 - Frequency of use of antihypertensive medication according to the blood pressure level found at the baseline visit.



Graphic 3 - Frequency of use of antihypertensive medication according to the presence or absence of symptoms.



Graphic 1 - Medication used at the baseline visit in the Emergency Unit.

The medical management was considered inappropriate in more than half of the cases, mainly as a result of the inappropriate use of medications, that is, in patients who did not meet the criteria for the diagnosis of hypertensive crisis, a finding that was similar to that of Gus et al[9]. Notably, although the treatment aiming to rapidly reduce blood pressure had been administered for higher BP levels, a smaller number of cases with mild BP increase or even BP within normal limits was also treated with antihypertensive medication.

These data may result from a lack of standardization in the care of patients with high blood pressure, as well as from the non-compliance of physicians to this standardization, which is a disturbing fact, since recent evidences suggest that increased BP alone, in the absence of symptoms, seldom requires specific emergency therapy[9], and, even more serious, precipitous BP reduction with the use of medication in patients with high BP, but without hypertensive crisis, may be harmful and cause a drop in perfusion and, occasionally, target-organ lesion.

Almeida[10], for instance, verified that BP reduction from severely increased levels to values of approximately 140 x 90 mmHg for 45 minutes resulted in a decrease in renal function by 44.7 ± 6.8%. This did not occur when BP was reduced to similar levels in moderately hypertensive patients, thus demonstrating the degree of unbalance in the renal autoregulation of severely hypertensive individuals.

Other undesirable consequences of the wrong diagnosis of hypertensive crisis and abuse of medications are overburdened emergency services and unnecessary expenses, as emphasized by Nobre et al[8].

The use of medications for BP control in patients diagnosed with a hypertensive crisis has been a matter of debates and controversies. In general, it is accepted that emergencies should be treated with intravenous medications aiming to reduce BP over a few hours, and urgencies with oral medications aiming to control BP over 24 hours[2]. Despite the lack of scientific background, for circumstantial reasons, the use of sublingual medications, especially captopril and nifedipine, is common in our midst; captopril is preferred because of its more gradual action[5,11]. Despite its proven efficacy in reducing BP[12,13], short-acting nifedipine has been harshly criticized in relation to its use in the treatment of hypertensive crises because the speed and intensity of BP reduction are unpredictable, and this can lead to target-organ ischemia. In fact, nifedipine has been pointed out as the cause of severe complications and deaths, especially in elderly individuals and patients with coronary artery disease[14-16], and is currently proscribed for the treatment of hypertensive crises, in compliance with current guidelines[5]. Despite these evidences, in this study we observed that nifedipine was still used in many patients, and, even more disturbing, frequently in the absence of criteria for the definition of a hypertensive crisis.

The data presented here demonstrate that physicians are not prepared to manage patients with high BP in the setting of an emergency unit. In addition, the medical management (appropriate vs. inappropriate) was neither influenced by specialty (cardiologists vs. non-cardiologists), nor by the professional's experience. Another interesting finding was that the analysis of predictive factors of the use of antihypertensive medications revealed that it was blood pressure levels, and not the presence or absence of symptoms, that influenced the decision of whether or not to use an antihypertensive drug.

For these reasons, the introduction and broad dissemination of specific guidelines for the management of hypertensive crises are necessary and should be adapted to the peculiarities of the emergency services in our country, so as to provide better health care, thus avoiding complications and unnecessary costs.

Potential Conflict of Interest

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

Sources of Funding

There were no external funding sources for this study.

Study Association

This study is not associated with any graduation program.

References

1. Sociedade Brasileira de Cardiologia. Sociedade Brasileira de Hipertensão. Sociedade Brasileira de Nefrologia. IV Diretrizes Brasileiras de Hipertensão Arterial. Arq Bras Cardiol. 2004; 82 (supl 4): 1-14.
2. Valdés SG, Roessler BE. Recomendaciones para el manejo de las crisis hipertensivas: documento de Consenso de la Sociedad Chilena de Hipertensión Arterial. Rev Med Chile. 2002; 130: 1-17.
3. Filgueira NA. Condutas em clínica médica. 2ª ed. Rio de Janeiro: Medsi; 2001.
4. Franco RJS. Crise hipertensiva: definição, epidemiologia e abordagem diagnóstica. Rev Bras Hipertens. 2002; 9: 340-5.
5. Praxedes JN, Santello JL, Amoedo C, Giorgi DMA, Machado CA, Jabur P. Encontro multicêntrico sobre crises hipertensivas – relatório e recomendações. J Bras Nefrol. 2001; 23 (supl 3): 1-20.
6. Mesquita ET. Rotinas de emergências cardiovasculares. São Paulo: Atheneu; 2001.
7. Martin JFV, Higashiama E, Garcia E, Luizon MR, Cipullo JP. Perfil da crise hipertensiva: prevalência e apresentação clínica. Arq Bras Cardiol. 2004; 83: 125-30.
8. Nobre F, Chauchar F, Viana JM, Pereira NKC. Avaliação do atendimento do hipertenso em serviço de urgência e ambulatório de hipertensão. Arq Bras Cardiol. 2002; 78 (2): 159-61.
9. Gus M, Andrigheto AG, Balle VR, Pilla MB. Abordagem terapêutica de pacientes com queixa de pressão arterial elevada em um setor de emergência cardiológica. Arq Bras Cardiol. 1999; 72 (3): 324-6.
10. Almeida FA. Emergências hipertensivas: bases fisiopatológicas para o tratamento. Rev Bras Hipertens. 2002; 9: 346-52.
11. Case DB, Atlas AS, Sullivan AP, Laragh JH. Acute and chronic treatment of severe and malignant hypertension with the oral angiotensin-converting enzyme inibitor captopril. Circulation. 1981; 64: 765-72.
12. Varon J, Marik PE. The diagnosis and management of hypertensive crisis.

Chest. 2000; 118: 214-27.

13. Beer N, Gallegos I, Cohen A, Klein N, Sonnenblick E, Frishman W. Efficacy of sublingual nifedipine in the acute treatment of systemic hypertension. Chest. 1981; 79: 571-80.

14. Zampaglione B, Pascale C, Marchisio M, Cavallo-Perin P. Hypertensive urgencies and emergencies: prevalence and clinical presentation. Hypertension. 1996; 27 (1): 144-7.

15. Opie LH, Messerli FH. Nifedipine and mortality: grave defects in the dossier. Circulation. 1995; 92 (5): 1068-73.

16. Furberg CD, Psaty BM, Meyer JV. Nifedipine: dose-related increase in mortality in patients with coronary heart disease. Circulation. 1995; 92 (5): 1326-31.