

Analysis of the Prescription of Captopril to Hospitalized Patients

Márcio Galvão Oliveira¹, Antônio Carlos Beisl Noblat¹, Lúcia Noblat¹, Luiz Carlos Passos²

Complexo Hospitalar Universitário Prof. Edgard Santos¹, Faculdade de Medicina da Bahia da Universidade Federal da Bahia², Salvador, BA - Brazil

One of the most common complications of Systemic Arterial Hypertension is the hypertensive crisis¹ characterized by a symptomatic elevation of blood pressure (BP) with or without involvement of target organs, which may lead to immediate or potential risk to life²⁻⁴. The hypertensive crisis may manifest itself as hypertensive emergency or urgency. In the emergency there is fast deterioration of target organs and immediate risk to life, a situation that does not occur in hypertensive urgency²⁻⁴. On the other hand, situations in which the patient presents elevated BP due to an emotionally charged, painful or uncomfortable event, with no evidence of lesion of target organs or immediate risk to life, characterize the hypertensive pseudo-crisis, a condition that does not require the use of emergency antihypertensive therapy^{1-3,5}. Despite this fact, the practice has become widespread of prescribing antihypertensive medication prior to situations believed to present a risk of abrupt BP elevation, irrespective of the symptoms. This study aims at assessing the frequency of prescription of captopril prior to BP elevation in patients hospitalized in a university hospital. It was also intended to map the places (clinical or surgical wards) where this procedure was more frequent.

Methods

A retrospective cross-sectional study was conducted in a university hospital with 308 beds. Since it is a teaching hospital, prescriptions are written mainly by resident doctors.

All the patients hospitalized during the first semester of 2005 who were prescribed captopril prior to BP elevation were identified using the medical prescriptions. The study focused on the following prescription: "Captopril 25 mg if BP \geq 170 x 110mmHg."

The following variables were obtained with the help of a standard form: use of captopril prior to BP elevation, maintenance anti-hypertensive therapy, hypertension diagnostic records, hospitalization units, records of medical

evaluation prior to the administration of captopril and administration route used. For the purpose of this study, we considered medical evaluation records prior to BP elevation all evaluation records upon BP elevation (as measured by the nursing staff), since the procedure was to administer captopril as previously prescribed.

To analyze the differences between the proportions we used either the chi-square test or Fischer's exact test. Patients hospitalized in the ICU were excluded. Statistical differences below 5% ($p < 0.05$) were considered significant.

This study was approved by the local Ethics Research Committee.

Results

During the study period, 2,771 patients were admitted: 2003 (72.3%) in surgical wards and 768 (27.7%) in clinical wards. The frequency of patients who were prescribed captopril prior to BP elevation was 25.7% (712/2,771). This procedure was more frequent ($p < 0.001$) in surgical wards (30.9%; 620/2,003) than in clinical wards (12.6%; 92/768).

The hypertension diagnosis was not written on the records of 52% (370/712) patients who were prescribed captopril prior to blood pressure elevation. This was more frequent ($p < 0.0001$) in surgical wards (56.1%; 348/620) than in clinical wards (23.9%; 22/92).

Of the patients considered hypertensive, 18.1% (62/342) had not been prescribed maintenance antihypertensive medication. This was the case especially in surgical wards (93.5%; 58/62).

Although captopril had been prescribed prior to BP elevation to 712 patients, the medication was administered to only 147 (20.6%) of them; 32.6% (30/92) of these were hospitalized in clinical wards and 18.9% (117/620) in surgical wards ($P < 0.0001$).

There was no medical evaluation prior to the administration in 81% (119/147) of the cases. This was more frequent ($p = 0.001$) in surgical wards (84.5%; 98/116) than in clinical wards (67.7%; 21/31). Additionally, 14.3% (21/147) of the patients who used captopril had not been diagnosed with hypertension.

Discussion

The data show that captopril prescription prior to BP elevation was frequent in the period assessed, and for most patients there was no record of hypertension diagnosis. Another study⁵ conducted in the same hospital in 1997

Key words

Prescriptions, drugs; hypertension; captopril; inpatients.

Mailing Address: Márcio Galvão Oliveira •

Rua Professor Sabino Silva, 558/403 - Jardim Apipema - 40155-250 - Salvador, BA - Brazil

E-mail: mgalvao@ufba.br

Manuscript received October 25, 2007; revised manuscript received December 21, 2007; accepted January 04, 2008.

demonstrated that nifedipine was widely prescribed in the same situation, although captopril was already prescribed in 4.3% of the cases. The authors pointed out that there was a possible trend towards substituting nifedipine for captopril and attributed this to the publication of studies about the potential risks of using nifedipine in fast acting formulations for the treatment of hypertension⁵.

The higher frequency of captopril prescription in surgical than in clinical wards may be related with the different interpretations by clinicians and surgeons as regards the approach to hypertension and the specifics of surgical and clinical environments⁵. Similarly, the higher frequency in surgical wards could also be related to the lack of careful pre-surgical assessment and to the surgeons' concern about patients developing hypertensive peaks perioperatively to the detriment of long-term BP control⁵. In the cases of BP elevation preoperatively, the antihypertensive therapy should be maintained until the minutes before the surgical procedure, and injectable antihypertensive medication should be used in cases of hypertensive crisis^{4,5}.

It is important to consider that the mere elevation of BP does not constitute a hypertensive crisis and does not require an immediate therapeutic approach to abruptly reduce BP. Aggressive antihypertensive treatment may bring risk to patients. Once the possibility of a hypertensive pseudo-crisis is excluded, immediate therapy should start⁴.

In this study, there was no medical assessment in the majority (81%) of cases prior to the administration of captopril and this was more frequent in surgical wards. In the study that assessed the prescription of nifedipine to hospitalized patients, there was no medical assessment in 98% of the cases⁶. This procedure delegates to non-medical professionals the decision on whether to use antihypertensive medication with no proper indication based only on the BP level, which may lead to complications for the patients. Additionally, the logical sequence of events that precedes good prescription and which is the physicians' responsibility is disrupted: diagnosing, determining the prognostic of the condition to be treated and of the therapeutic objectives, as well as selecting the appropriate treatment. Of course medical evaluation is indispensable to determine the therapy that is appropriate to hypertensive emergency or urgency and even the treatment of symptoms of pseudo-crisis.

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As regards patients who used captopril, 14.3% had not been diagnosed with hypertension. In addition to unnecessary exposure to medication, these patients ran the risk of presenting adverse events as a result of such exposure.

Some studies have demonstrated the importance of the hospital stay as an opportunity to control hypertension^{7,8}. Captopril prescription prior to BP elevation in hypertensive patients who are not in maintenance antihypertensive therapy shows that the hospitalization period might not be taken advantage of as regards choosing the best therapeutic regime to control hypertension according to the evidence available, including non-pharmacological approaches. Although captopril prescription prior to BP elevation has been more frequent in surgical wards, it was administered mostly in clinical wards. This may be explained by the higher frequency of patients with hypertension in clinical than in surgical wards, although it does not reflect better management of patients; also, some of them may have been discharged with no proper control of BP.

An important aspect of this study is the absence of evidence to support the need of prescribing captopril prior to BP elevation. Although this is a current practice, it is clear that it has to be reviewed to eventually be incorporated as a therapeutic conduct.

The data presented, as well as the literature reviewed, show no evidence that warrants the prescription of captopril prior to BP elevation in hospitalized patients. Although this practice has been more frequent in surgical wards, the results presented here suggest that this topic should be approached in continued medical education to improve health care quality.

Potential Conflict of Interest

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

Sources of Funding

This study was partially funded by CNPQ.

Study Association

This article is part of the thesis of master submitted by Márcio Galvão Oliveira, from Universidade Federal da Bahia.