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Antihypertensive drug prescription trends in Shahrekord, Iran

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ARTICLE INFO

Article Type:
Original

Article History:

Received: 1 February 2021

Accepted: 4 May 2021

Published online: 18 May 2021

Keywords:

Hypertension

Antihypertensive drugs

Blood pressure control

ABSTRACT

Introduction: Hypertension is one of the most leading causes of death worldwide. It is an important risk factor for ischemic heart disease (IHD), chronic kidney disease (CKD) and cerebrovascular diseases.

Objectives: The aim of the study was evaluation of the status of blood pressure control and trends in prescribed antihypertensive medication usage among hypertensive patients in Shahrekord, Iran.

Patients and Methods: In a cross-sectional descriptive study 250 hypertensive patients were enrolled. The patients were evaluated based on the status of blood pressure (BP) control and the prescription trends and efficacy of antihypertensive drugs. The data were also evaluated in subgroups of diabetics or non-diabetics, smokers or non-smokers, patients with or without CKD, patients with or without IHD.

Results: A total of 250 patients (149 women and 101 men) were enrolled in this study. The mean age of participants was 66.22 ± 13.58 years. Mean systolic and diastolic BP were 143.4 ± 29.4 mm Hg and 85.8 ± 12.5 mm Hg respectively. Poor controlled BP was seen in 106 patients. The more common prescribed antihypertensive drugs were angiotensin receptor blockers (46%), diuretics (33.6%) and beta-blockers (32.8%).

Conclusion: The study showed that most of the patients had poor controlled BP and physicians increasingly prescribe angiotensin receptor blockers.

Implication for health policy/practice/research/medical education:

Evaluation of the status of BP control and trends in prescribed antihypertensive drugs are important for planning of education courses for both patients and physicians.

Please cite this paper as: Maghsoudi A, Dehghani Mobarakeh M, Momeni A, Nematollahi A, Asgari Sh, Rasooli L. Antihypertensive drug prescription trends in Shahrekord, Iran. J Nephroarmacol. 2022;11(1):e13. DOI: 10.34172/npj.2022.13.

Introduction

Hypertension is a common and serious leading cause of morbidity and mortality worldwide (1,2). Hypertension is associated with an increased risk of glucose intolerance, cardiovascular disease, reduce cognitive function and chronic kidney disease (CKD) (3-6). In recent decades, treatment of hypertension reduced the morbidity and mortality of cardiovascular disease (7). Common prescribed antihypertensive agents are diuretics, β -blockers, calcium channel blockers (CCBs), angiotensin-converting enzyme inhibitors (ACEIs), and angiotensin receptor blockers (ARBs) (7-9).

Fixed-dose combination of antihypertensive drugs may be more effective in reducing blood pressure (BP) than increasing dose in mono-therapy (10). Diuretics

commonly were recommended as the first-line agents for antihypertensive treatment, but recent data show an increasing use of more expensive drugs such as CCBs and ACEIs (11).

Objectives

There are a few studies about the prescription trends of antihypertensive agents in Iran. Beta-blockers are shown to be the most common drugs prescribed in these studies (12-14). The aim of the study was evaluation of the status of BP control and trends in prescribed antihypertensive agents in hypertensive patients in Shahrekord city, Iran.

Patients and Methods

The study was a cross-sectional distributive study

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conducted in the general ward of Hajar hospital in Shahrekord city, Iran (2012-2013). According to The JNC 8 (eighth Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High BP), hypertension was defined as mean systolic BP ≥ 140 mm Hg, mean diastolic BP ≥ 90 mm Hg, or history of hypertension and antihypertensive drugs consumption. BP control was defined as a mean systolic BP < 140 mm Hg and a mean diastolic BP < 90 mm Hg for all patients including with diabetes mellitus or CKD (7,8).

A total of 250 hypertensive patients with age greater than 18 were enrolled in the study. Pregnant women were excluded from the study. Demographic criteria (age, gender), past medical history (DM, CKD and IHD) and drug history (name and dose of antihypertensive agents) were mentioned in patients file. BP was measured by using standard mercury sphygmomanometer after 5 minutes resting in sitting position.

Statistical analysis

Data are arranged in simple frequency tables and results are shown as the percentages. Chi-square test was used for comparison of percentages. Statistical analysis was done using SPSS software (SPSS version 18 Inc, Chicago, IL, USA).

Results

In the descriptive study 250 hypertensive patients (149 women and 101 men) were enrolled. The average age of participants was 66.22 ± 13 years. Eighty-seven patients (34.8%) were also suffering from DM, 136 patients (54.4%) had history of IHD and 70 patients (28%) were involved with CKD. Forty patients (16%) were also smoker. 163 patients (65.2%) used standard doses of antihypertensive agents and 87 patients (34.8%) did not use standard doses. Mean systolic BP was 143 ± 29.4 mm Hg ranging 80 to 250 mm Hg and mean diastolic BP was 85.8 ± 12.5 mm Hg ranging 60 to 160 mm Hg. Sixty-four patients (25.6%) had controlled systolic BP and 18 patients (7.2%) had controlled diastolic BP. In 37 patients (14.8%) both systolic and diastolic BP were controlled and in 131 of them (52.4%) none of them were controlled.

The most common prescribed drug class in both genders and all ages was ARBs (especially losartan; 46%) followed by diuretics (especially Thiazides; 33.6%), CCBs (31.6%), beta-blockers (32.8%), ACEIs (22.4%) and α -blockers (6.8%). There were no significant differences between men and women in the prevalence of prescribed drugs (Table 1).

The most frequent drug class in IHD group was ARBs followed by diuretics and CCBs. The most frequent drug class in DM and CKD groups was ARBs followed by CCBs (Table 2). Diuretics + ARBs was the most common combination therapy.

Discussion

The benefits of BP control with antihypertensive agents have become increasingly evident, with decreases in mortality (7). It shows the importance of BP control. It also shows the importance of educations about life style modification and treatment compliance. Although most of participants used standard doses of antihypertensive agents, they had poor BP control. This result is shown in other studies (7,12). It may be explained by poor compliance of the patients, lack of knowledge, unhealthy life style and interaction with other drugs such as non-steroidal anti-inflammatory drugs (NSAIDs). It also shows the benefit of the regular visits of these patients by physicians. In fact some people have misconceptions about the chronicity of disease. They believe hypertension as not a controllable but a curable disease with a short course treatment. Some patients say that they use prescribed antihypertensive drugs whenever they feel headache or flushing. Patient self-monitoring of BP at home and explanation about medications and their importance are highly effective ways of controlling hypertension (13).

Our study found that ARBs and CCBs are increasingly used in Shahrekord city and beta-blockers are less frequent. The rising use of ARBs can be explained by their benefits in congestive heart failure, DM and CKD (8). These findings confirm the results of Gu et al which proposed that the decreasing use of β -blockers may be explained by physicians' misperceptions that β -blockers are less tolerated than other drug classes (7). Differing from our results Tomas et al reported ACEIs as the most

Table 1. Prevalence of antihypertensive drug use in men and women

Drug	Male (%)	Female (%)	P value*
CCBs	28.7	33.6	0.74
Diuretics	33.7	33.6	0.1
ACE inhibitors	21.8	22.8	0.35
ARBs	51.5	42.3	0.67
Beta-blockers	24.8	38.3	0.25
Spirolactone	7.9	2.6	0.26
Alfa-blockers	12.9	2.7	0.65
Alfa2-agonists	3	1.3	0.17

Table 2. Prevalence of antihypertensive drug use in subgroups

Drug	DM (%)	CKD (%)	IHD (%)
CCBs	42.5	52.9	31.6
Diuretics	34.4	42.9	34.5
ACE inhibitors	18.3	25.7	24.3
ARBs	59.7	55.7	50
Beta-blockers	18.4	20	34.5
Spirolactone	4.6	2.9	6.2
Alfa-blockers	9.2	14.3	8.8
Alfa2-agonists	3.4	5.7	2.2

common drugs prescribed in Serbia; however, in their study, β -blockers and diuretics are less prescribed (14).

The most common combination therapy was ARBs + diuretics (especially thiazides) which is different than the study of Ishida et al that reported CCB + ARB as the most frequent multidrug therapy (15). Gu et al reported a diuretic plus an ACE inhibitor, β -blocker, or CCB as the most common combinations (7). Diuretics provide additive BP lowering effects when combined with ACEIs, ARBs and beta-blockers (16-18) however it is difficult to elicit which one is the priority in combination with diuretics. The primary strength of this study is using the standard method for checking BP. Furthermore, trained personnel interviewed participants and checked their BP.

Conclusion

We conclude that more knowledge and educations are needed for both doctors and patients. Using short and regular education courses, pamphlets and posters in addition to self-monitoring can improve the status of BP control.

Limitations of the study

There are several limitations in this study. First of all, the participants were asked about antihypertensive drugs used at the time of study but not the drugs they had used before. Additionally, some people feel ashamed of not using antihypertensive drugs regularly and we don't have any document about the participants' compliance.

Authors' contribution

MDM and ARM designed the study. ShA and LR gathered data. AM and AN participated in data analysis. LR prepared the final draft.

Conflicts of interest

The authors have no conflict of interest.

Ethical issues

The research followed the tenets of the Declaration of Helsinki. Informed consent was obtained from the patients. The study was funded by the Research and Technology Deputy of the Shahrekord University of Medical Sciences and was approved by the Ethics Committee (Ref #1252, 2012-13). Besides, ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

Funding/Support

This study was supported by a grant from Shahrekord University of Medical Science (Grant#1252,2012-13).

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