



Prescribing Pattern of Drugs in Hypertensive Patients-A Retrospective Study

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Aims: The prescribing pattern of drugs used for treating hypertension changes over time in response to changes in recommended guidelines and innovations in drug formulations, among others. In addition, the classes of antihypertensive drugs used vary among the countries. The objective of this study was to analyze the Prescribing practice of antihypertensive medications in a tertiary care hospital in India.

Study Design: Retrospective analysis of prescription practice for hypertensive outpatients.

Place and Duration of the Study: Tertiary care hospital, Kanchipuram District, Tamil Nadu, India and duration of the study was one year.

Methodology: Prescription practice for 400 hypertensive outpatients were analyzed on basis of age, percentage of male and female patients, anti-hypertensive drug category, most frequently prescribed hypertensive drug and percentage of one/two drug combination.

Results: As monotherapy ACE-Inhibitors 38.25% (153) were the most commonly prescribed

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antihypertensives followed by calcium channel blockers 19.25% (77), Loop-Diuretics 13.25% (53), Beta-blockers 6.75% (27), Angiotensin-2 antagonists 6.75% (27) and Vasodilator 3.5% (14) ranked last in this study. Combination treatment usually consisted of two antihypertensive drugs as a Co-formulation, the most common combination was a ACE-Inhibitors+CCB 5% (20), followed by Beta-blocker+CCB 3.5% (14), ACE+ Loop-diuretics 2.75% (11) and CCB+CCB 1% (4). Patients gender, age and comorbidities significantly influenced which treatment was prescribed.

Conclusion: In this study it was keenly noted that the ACE-Inhibitors are the most commonly prescribed monotherapy antihypertensive agents 38.25% (153) and their prescribing pattern was in consistent with the guidelines. Thiazides and the combination drugs were underutilized in this study, despite robust evidence to support their use.

Keywords: Medicine; ambulatory; prescripion and records.

ABBREVIATONS

ACE-Angiotensin Converting Enzyme; CCB-Calcium Channel Blocker; WHO-World Health Organization.

1. INTRODUCTION

Hypertension is currently the most common chronic disease in clinical practice, and carries a substantial global burden to patients, physicians and the healthcare system [1]. Worldwide, around 54% of stroke and 47% of ischemic heart disease were due to hypertension alone [2]. Some studies have shown that the risk of stroke among hypertensive patients was seven times more than those with normal blood pressure [3,4]. According to the World Health Organization (WHO) estimate, at least a billion people in the world are living with hypertension and about 7.1 million mortality annually [5]. The prevalence of hypertension is increasing and is predicted to grow by more than 500 million by 2025 [6,7]. Evidence from large clinical trials now suggests that lowering blood pressure effectively prevents these adverse outcomes [8,9]. Even with treatment, control of blood pressure can be difficult, with only one-third of treated hypertensive's having a systolic blood pressure (SBP) that is less than 140 mm Hg [10,11]. Despite these facts and the widespread availability of effective antihypertensive medications, the vast majority of >1 billion hypertensive patients worldwide remain with Uncontrolled BP [12]. Even among hypertensive patients who receive treatment, in most countries at least half of them fail to reach currently recommended BP targets [12]. Nevertheless, population-based surveys of hypertension management throughout the world consistently show variably inadequate control of blood pressure [13,14]. In India, hypertension is the leading non-communicable disease (NCD) risk and estimated to be attributable for nearly 10 per cent of all deaths [15]. Adult hypertension

prevalence has risen dramatically over the past three decades from 5 per cent to between 20-40 per cent in urban areas and 12-17 per cent in rural areas [16,17]. The number of hypertensive individuals is anticipated to nearly double from 118 million in 2000 to 213 million by 2025 [18]. The objective of the present study was to analyze the prescribing practice of antihypertensive drugs in a tertiary care hospital.

2. MATERIALS AND METHODS

The retrospective study was conducted for a period of one year from 1st January 2014 to 31st December 2014 in a tertiary care hospital, kanchipuram District, Tamilnadu, India, to survey the prescription practice for 400 hypertensive outpatients. "The prescriptions of outpatients which contained at least one antihypertensive agent were selected for further analysis by following World Health Organization (WHO) drug use indicators [19]". Ethical approval for this study was provided by local Ethical Committee of SRM University which permits and confirms that the institute gives approval to release the data. The brand names of drugs in prescriptions were decoded to generic names of drugs. Drug selection indicators selected for present study includes age, percentage of Both patients (Male and Female), anti-hypertensive drug category, name of prescribed drug, most frequently prescribed antihypertensive drug, percentage of one/two drug combination.

3. RESULTS

Out of the 400 prescriptions of antihypertensive drugs were studied, the percentage of males with hypertension was 59.75% (239), whereas the

percentage of females was 40.25% (161). Among the total male patients there were 15.8% (38) were alcoholic, 15% (36) smokers and 28% (67) with both the habits of smoking and alcohol consumption. The frequency of the oral antihypertensive drug classes were as follows: ACE-inhibitors 38.25% (153), calcium channel blockers 19.25% (77), Loop-diuretics 13.25% (53), Beta-blockers 6.75% (27), Angiotensin-2 antagonists 6.75% (27) and Vasodilator 3.5% (14) (Table 1).

Table 1. Percentage of prescribed monotherapy antihypertensives

Drug class	Number of prescriptions (n)	Percentage (%)
ACE inhibitors	153	38.25
Calcium channel blockers	77	19.25
Loop-diuretics	53	13.25
Beta-blockers	27	6.75
Angiotensin 2-antagonists	27	6.75
Vasodilators	14	3.50

Among combination therapy often 2 drug combinations were prescribed, the most common combination was ACE-inhibitor + CCB 5% (20) followed by beta-blocker+ CCB 3.5% (14), ACE-inhibitor+ Loop diuretics 2.75% (11) and CCB+CCB 1% (4) (Table 2).

Table 2. Percentage of combination drugs used for treatment

Drug combinations	Number of prescriptions (n)	Percentage (%)
ACE inhibitors + CCB	20	5
Beta-blockers + CCB	14	3.5
ACE-inhibitors + Loop diuretics	11	2.75
CCB + CCB	4	1

4. DISCUSSION

Treating a blood pressure above 140/90 mm Hg has been shown to reduce cardiovascular risk. Physician may start treatment and nevertheless not reach target blood pressure values in their patients due to "therapeutic inertia", defined as a failure to expand therapy when treatment goals are unmet. Thus, in a recent Canadian study in 7253 treated hypertensive patients, antihypertensive therapy was increased in only 13.1% of visits with uncontrolled blood pressure

[20]. Abundant evidence from randomized controlled trials (RCTs) has shown benefit of antihypertensive drug treatment in reducing important health outcomes in persons with hypertension [21,22]. Several hundreds of thousands of major cardiovascular events might possibly have been prevented as a result of improvements in practice [23]. For the pharmacological management of hypertension, treatment thresholds and targets should be predicated on the patient's global atherosclerotic risk, target organ damage and co-morbid conditions. Blood pressure should be decreased to less than 140/90 mmHg in all patients, and to less than 130/80 mmHg in patients with diabetes mellitus or chronic kidney disease. Most patients will require more than one agent to achieve these target blood pressures. Antihypertensive therapy should be considered in all adult patients regardless of age (caution should be exercised in elderly patients who fail). For adults without compelling indications for other agents, considerations for initial therapy should include thiazide diuretics, Angiotensin-Converting Enzyme (ACE) inhibitors (in patients who are not black), long-acting calcium channel blockers (CCBs), angiotensin receptor blockers (ARBs) or beta-blockers (in those younger than 60 years of age) [24]. Medications for hypertension need to be taken for the entire life and factors like efficacy, side effects, drug interactions and cost of therapy need to be taken into consideration. Poor medication adherence may also lead to increased morbidity, mortality, hospitalization admissions and escalated healthcare costs [25,26]. It is therefore important that once the diagnosis of hypertension is established, blood pressure should be adequately controlled through regular follow-up, lifestyle modification, exercise and effective antihypertensive drugs [27]. Thus the studies must be focused on prescription practice for effective treatment of this epidemic disease. A total of 400 prescriptions were collected in which all the basic demographic data of the patient like blood pressure, sugar level (if the patient is diabetic), past medication history, social and family history was gathered. ACE-Inhibitors constitute the most frequently prescribed antihypertensive drug class. Among all ACE-inhibitors ramipril was the most commonly prescribed, its prescription pattern was similar to worldwide trend. In the Heart Outcomes Prevention Evaluation (HOPE) Study of 9297 patients, ramipril reduced, by 20-30%, the rates of death, myocardial infarction, and stroke in a broad range of high-risk patients, who were not known to have a low ejection

fraction or heart failure [28]. Moreover ACE-inhibitors are the most commonly prescribed antihypertensives for diabetic patients, which was also in accordance with the evidence and the guidelines as these drugs will reduce the chance of occurrence of diabetic nephropathy, retinopathy and other related complications. When calcium channel blockers were concerned their percentage of prescription was 19.25% (77), among the calcium channel blockers the most commonly prescribed drugs were the dihydropyridine type of calcium channel blockers (ie., amlodipine, felodipine) whereas the prescription of non-dihydropyridine type of calcium channel blockers was very less. In the case of diuretics the overall preference for prescribing the thiazides was negligible on the other hand there were 13.25% (53) of prescriptions with loop-diuretics. The percentage of prescription of angiotensin-2 antagonists was 6.75% (27) of which 90% of prescriptions were with the brand name Telma (telmisartan) which clearly indicates that telmisartan was the most commonly prescribed angiotensin-2 antagonist by the physicians in the hospital. The overall preference for prescribing beta-blockers was only 6.75% (27) among all the prescriptions. As per the combination therapy was concerned only 12.25% (49) has a combination drug therapy for the treatment of hypertension, all the prescriptions which were containing a combination therapy consisted only a two drug combination.

5. CONCLUSION

Present study represents the current prescribing trend for antihypertensive agents. It was noticed that there was primary preference for monotherapy and the combination therapy is avoided in majority of the prescriptions. It also implies that ACE-inhibitors are the leading group of antihypertensive agents followed by calcium channel blockers. Further studies focused on the rationale for choice of drugs based on demographic data, economic status, associated conditions and complications would give additional knowledge in prescribing practice of hypertension in India.

CONSENT

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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