A CROSS-SECTIONAL STUDY OF ANTIHYPERTENSIVE DRUG UTILIZATION PATTERN IN RURAL POPULATION OF SOUTHERN INDIA

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ABSTRACT

Objectives: The objective of the study is to study the antihypertensive drug utilization pattern, demographic profile, and associated comorbid conditions of hypertensive patients in the rural population of Southern India.

Methods: This study was a cross-sectional, community-based, door-to-door survey of hypertensive patients. The details of the patients which include age, sex, body mass index (BMI), past medical history, usage of drugs for hypertension (HTN), any other related drugs, and comorbid conditions were collected in this study.

Results: As per the results, the mean age of study participants was 54.68 years, men were 62.31% women were 37.68%, mean BMI was 30.48 kg/m^2. In associated comorbidities with HTN, Diabetes was the most common with 19.4%. As per usage of antihypertensive drugs, In Monotherapy, angiotensin-converting enzyme (ACE) inhibitors/angiotensin receptor blockers (ARBs) occupy 16.4% followed by beta-blockers (BB) 13.4%.In 2+ drug therapy, Diuretics were 26.8% followed by BB 22.7% and in drug combinations, the combination of ACE/ARB + Diuretics were 11.5% followed by ACE/ARB + calcium channel blocker at 8.2%.

Conclusion: HTN was more common in Men and the BMI was also on the higher side in hypertensive patients. In associated comorbidities with HTN, Diabetes was the most common disease. Antihypertensive drugs usage pattern shows that in monotherapy, ACE inhibitors/ARBs were the most commonly used drugs. In 2+ therapy, the most common add-on drugs were diuretics. In combination therapy, the most common combination was ACE/ARB + Diuretics.

Keywords: Antihypertensive drugs, Angiotensin converting enzyme inhibitors, Angiotensin receptor blockers, Calcium channel blocker.

INTRODUCTION

Hypertension (HTN) is one of the most prevalent diseases in India with a significant burden on the health care system. As per the Global Burden of Disease study, the estimated deaths due to HTN were 1.63 million in India in the year 2016 alone [1]. Epidemiological studies reported that the prevalence of HTN is escalating rapidly among Indian urban and rural populations. The estimated prevalence of HTN in India is to vary from 4% to 15% in urban and 2–8% in the rural population [2]. In India, the increasing prevalence of obesity has been primarily correlated with HTN [3]. Other important reported risk factors include age, smoking, chewing tobacco, alcohol consumption, raised body mass index (BMI), consumption of low vegetables/fruits, high consumption of dietary fat and salt, and a sedentary life style [4].

Poorly controlling this highly prevalent disease can lead to the development of ischemic heart disease, cerebrovascular accidents, diabetes, and renal diseases. This situation is a serious concern in our country since with modernization, we are changing from healthy traditional diets for fatty foods, calm life to a stressful modern life and reduced physical activity [5]. For treatment of HTN, many groups of antihypertensive drugs are available like angiotensin-converting enzyme inhibitors (ACEIs), Angiotensin II receptor antagonists (angiotensin receptor-II blockers [ARBs]), beta-blockers (BBs), diuretics, calcium channel blockers (CCBs), α-blockers, vasodilators for the treatment of HTN. Lifestyle modifications such as weight loss, cessation of smoking, following a balanced diet, decreased salt intake, consistent exercise, and limiting alcohol consumption will reduce the risk of HTN [6,7]. The higher choice of fixed-dose combination products offers a potential means of reducing pill burden and cost for the patient convenience and compliance [8]. It is necessary to define drug utilization patterns and to identify the adherence to the prescriptions for a better understanding of HTN. The present study is aimed to assess the demographic profile of patients suffering from HTN and the pattern of drug utilization in the management of HTN in the rural population of southern India.

METHODS

This study was a community-based cross-sectional survey conducted in the Ramapuram village, V.K Padumandal of Nellore District in Andhra Pradesh. A door-to-door survey was carried out and all the members aged above 18 years, present in the household during the time of the survey, were included in this study. A total of 268 hypertensive patients have participated in this study. The study was conducted between January 20, 2021 and March 19, 2021. The details of the patients which include age, sex, BMI, past medical history, usage of drugs for HTN, any other related drugs, and comorbid conditions were collected in this study. All the covid-19 safety protocols were followed during the study [9].

The certificate from the institutional ethics committee was obtained on November 20, 2020 and Informed consent was being taken from the patients before collecting the data.

RESULTS

The results of the study will be tabulated in the following manner.

Table 1 shows that the mean age of study participants was 54.68 years, men were 62.31% and women were 37.68%, mean BMI was 30.48 kg/m^2.

In associated comorbidities with HTN, Diabetes was the most common with 19.4% followed by usage of Cholesterol medication 15.3%, Post myocardial infarction 2.68%, Stroke 0.7%, Thyroid disorders 4.47%, other diseases such as rheumatoid arthritis, bronchial asthma, COPD, and hemorrhoids occupy 3.73%.

Table 2 shows that usage of antihypertensive drugs, in which ACEIs/ARBs occupy 16.4% followed by BB 13.4%, CCB 9.8%, Diuretic 4.5% were used as Monotherapy. In 2+ therapy, Diuretics were 26.8% followed by BB 22.7%, angiotensin converting enzyme (ACE)/ARBs 17.9%, CCB 16.4%, In Combinations, combination of ACE/ARB + Diuretics were 11.5%, ACE/ARB + CCB were 8.2%, BB+ Diuretics were 10.1% and other combinations were 2.9%.

DISCUSSION

HTN is one of the most prevalent diseases in India with a significant burden on the health care system. Patients with chronic HTN are at a higher risk for developing coronary artery disease, cerebrovascular accidents, peripheral vascular disease, ophthalmic diseases, and renal problems.

As the rural population is more in India and the healthcare facilities were comparatively low in rural areas than urban areas in India, the current study aimed to assess the demographic profile of patients suffering from HTN and the pattern of drug utilization in the management of HTN in rural population of southern India. As per the results, HTN is more common in Men, and the BMI was also on the higher side in hypertensive patients. In associated comorbidities with HTN, Diabetes was the most common disease followed by usage of Cholesterol medication, post-

Table 1: Demographic profile and associated comorbid conditions of hypertensive patients using antihypertensive medication

Characteristics	Number of patients (n=268) (percentage or mean)
Age (years)	54.68
Men (%)	62.31
Women (%)	37.68
BMI (kg/m²)	30.48
Comorbidity (%)	
Diabetes (%)	19.4
Cholesterol medication (%)	15.3
Post myocardial infarction (%)	2.68
Stroke (%)	0.7
Thyroid disorders (%)	4.47
Any other diseases	3.73

BMI: Body mass index

Table 2: Percent of the hypertensive population taking a specific drug class as monotherapy, or, as 2+therapy or taking a specific combination

Monotherapy	Percentage
ACE/ARB	16.4
BB	13.4
CCB	9.8
Diuretic	4.5
2+Therapy	
ACE/ARB	17.9
BB	22.7
CCB	16.4
Diuretic	26.8
Combinations	
ACE/ARB+diuretic	11.5
ACE/ARB+CCB	8.2
BB+diuretic	10.1
Other medication	2.9

BB: Beta blocker, CCB: Calcium channel blocker, ARB: Angiotensin receptorblockers, ACE: Angiotensin converting enzyme

myocardial infarction, Stroke, thyroid disorders, other diseases such as rheumatoid arthritis, bronchial asthma, chronic obstructive pulmonary disease, and hemorrhoids.

Antihypertensive drugs usage pattern shows that in monotherapy, ACEIs/ARBs were the most commonly used drugs followed by BB, CCB, Diuretics. In 2+ therapy, the most common add-on drugs were diuretics followed by BB, ACE/ARB, CCB. In combination therapy, the most common combination was ACE/ARB + Diuretics followed by BB+Diuretics, ACE/ARB+CCB.

This study was supported by McInnis *et al.* [9]. They showed that ACEIs/ARBs were the most commonly used drugs and in those on 2+ therapy, a renin-angiotensin-system blocker was also the most common class, followed by a diuretic.

This study was supported by Yuvaraj *et al.* [10]. They showed that males of all age groups had a higher prevalence than females. Another study by Cidda *et al.* [2] also showed that the most common drug classes involved in the study were ARBs followed by CCBs. Cidda *et al.* stated that the results of pharmacotherapy revealed that dual therapy was the most preferred choice of treatment in reducing systolic blood pressure which is the same as the present study results.

A similar study by Radhika [11] is also observed that the most common drug class was used in the treatment of HTN study were ARBs. Another study by Kaur *et al.* [12], stated that the ACEI and CCBs were the most commonly prescribed antihypertensive drugs followed by BB and diuretics.

CONCLUSION

As per this study, HTN is more common in Men, Diabetes was the most common disease associated with HTN. ACEIs/ARBs were the most commonly used drugs as monotherapy, in 2+ therapy, the most common add-on drug was diuretic and in combination therapy, the most common combination was ACE/ARB + Diuretics. So further investigation on adherence to the antihypertensive medication, as well as control rate of blood pressure readings is necessary for a better understanding of the hypertensive status of the rural Indian population.

CONFLICT OF INTEREST

None.

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee with protocol number–Pharmac/006/11/2020,dated20/11/2020.

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