



## RESEARCH ARTICLE

## PRESCRIPTION PATTERN OF ANTI-HYPERTENSIVE DRUGS IN A TERTIARY CARE HOSPITAL IN KERALA AND ADHERENCE TO JNC-8 GUIDELINES

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### Abstract

**Objective:** Hypertension is a leading contributor to the global burden of cardiovascular morbidity and mortality. Worldwide prevalence is continuing to increase. Treatment for hypertension is constantly evolving and many new drugs are added at rapid pace. The objective of this study is to investigate utilization pattern of antihypertensive drugs in hypertensive patients in Azeezia institute of Medical Sciences and Research and to find its adherence to JNC-8 guidelines for management of hypertension.

**Methods:** Descriptive drug utilization study was conducted on 266 hypertensive patients for period of 3 months. Data retrieved from patient's medical record. The study included all hypertensive patients with or without co-morbidities and above 18 yrs who attended out-patient department. Following classes of antihypertensive drugs were analyzed: Angiotensin Converting Enzyme Inhibitors (ACEI), Angiotensin Receptor blockers (ARB), beta blockers, calcium channel blockers, diuretics. ACEI/ARB was mostly prescribed which is in adherence to JNC-8 guidelines which recommends the use of ACEI/ARB as the first choice of drug.

**Results:** Hypertension is more prevalent in males than in females. ACEI/ARB are the most frequently prescribed classes of drugs alone or in combination, supporting the medication adherence to JNC-8 guidelines.

**Conclusion:** The study concludes that the hypertension is more prevalent in males than in females, with its prevalence increasing with age.

**Keywords:** Antihypertensive drugs, drug utilization, hypertension, JNC-8 guidelines, prescription pattern.

## INTRODUCTION

Hypertension is a leading contributor to the global burden of cardiovascular morbidity and mortality. Worldwide prevalence of hypertension is estimated to be as large as one billion and its prevalence is predicted to increase by approximately 60% by 2025. It varies from 4-15% in urban and 2-8% in rural population<sup>1</sup>. Apart from unhealthy lifestyles, lack of awareness, distorted public health systems, physicians also lag behind in giving treatment according to standard guidelines. Noncompliance to antihypertensive therapy is also a reason for uncontrolled hypertension. Hypertension is now a strongest modifiable risk factor for myocardial infarction, stroke, heart failure, chronic kidney diseases and retinopathy<sup>2</sup>. Treatment of hypertension is constantly evolving in response to new evidence published and newer drugs are added at rapid pace. The resultant changes in drug use in time and

place may have medical, social and economic implications both for individual patient and for populations<sup>3,4</sup>. Recommendations of various guidelines are available for their treatment, one such guideline is JNC 7 which recommends the rationale administration of drugs by providing algorithms for the treatment as per stages of hypertension<sup>5</sup>. Hypertension is divided into four categories: normal, prehypertension, stage 1 HTN and stage 2 HTN<sup>6,7,8</sup>. JNC8 recommended four medication classes for Hypertension treatment in the general population with thiazide-type diuretics being first line therapy. Recommended classes are thiazide-type diuretics, calcium channel blockers, angiotensin-covering enzyme inhibitors and angiotensin receptor blockers<sup>9</sup>. This study was designed to assess the current trend of the prescription pattern of antihypertensive drugs and to determine the adherence to JNC8 guidelines<sup>9,10</sup>. This kind of medical audit can help to

make prescription pattern more rational and prudent and thereby improve patient health care.

## MATERIALS AND METHODS

The observational, prospective study was carried out at Azeezia Medical Hospital, Kollam. Data of drug prescribed were taken from patient's medical record. The study was approved by Institutional Human Ethical Committee of Azeezia Institute of Medical Sciences and Research, Kollam

**Study design:** This study was observational prospective conducted over 3 months period from May 2016 to July 2016 for assessing prescription pattern and drug utilization of antihypertensive in the management of hypertension and its adherence to JNC8 Guidelines. Total of 266 patients were included into study.

**Study setting:** The study was carried out in the outpatient department of Azeezia Medical Hospital, Kollam for collection of data.

**Study Population:** The study included all hypertensive patients.

**Inclusion criteria:** were 1) Age above 18 years, 2) Patients with co- morbidities such as Diabetes, risk of cardiovascular disease, Chronic Kidney diseases and Bronchial Asthma.

**Exclusion criteria:** were patients with terminal illness.

### Data Collection:

All necessary and relevant information patient and drugs prescribed were collected from patient's medical records. The data were filled in the Performa prepared which was approved by the Institutional Ethics Committee. The JNC8 Guidelines for the adherence were studied by taking into consideration that the drugs recommended as the first line therapy by JNC8 should be the most frequently prescribed class of drugs and should have high utilization pattern among the patients.

### Statistical Data Analysis:

The data was analysed using SPSS software. A P value  $\leq 0.05$  was declared as statistically significant.

## RESULTS

The results of this analysis shows that out of 266 hypertensive patients included, 57.5% were males while remaining 42.5% were females. This indicates the more number of patients with hypertension were males. Total 42.9% of people and 54.5% of hypertensive patients were from age group between 45-65 years and above 65 years respectively.

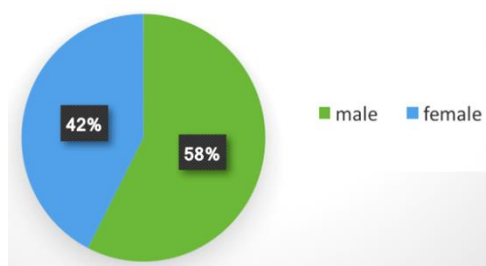


Figure 1: Number of patient in each sex groups.

Only 7 patients out of 266 (2.6%) were from age group less than 45 years. This data suggest age as the risk factor for hypertension. Out of 266, 78.2% of hypertensive patients were found to have other co-morbid conditions. Among the total 208, maximum patients were having diabetes mellitus followed by cardiovascular and kidney disease.

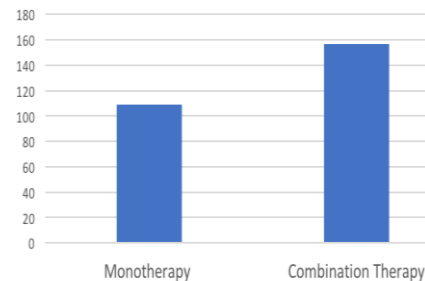


Figure 2: Type of therapy taken by hypertensive patients.

Considering out of the total 266 patients, 109(40.9%) patients received monotherapy while the remaining were put on multidrug regimen. 95 (35.8%) patients were on 2 drug therapy and 62(23.3%) were on 3 drug regimen.

Table 1: Age Distribution of patient.

Age Groups (Years)	Number of patient (n = 266)	% of patient in each group
Below 45	7	2.6
45-65	114	42.9
Above 65	145	54.5

Among the monotherapy, maximum patients were on ARB/ACEI with 31.2% followed with calcium channel blockers with 5.6% and diuretic (4.1%). As a monotherapy Losartan was the most frequently prescribed drug along with thiazides and metoprolol. The prescription pattern of antihypertensives (ACEI/ARB) were found to be considerably in adherence to Eighth report of Joint National Committee (JNC 8) for prevention, detection, evaluation and treatment of hypertension, which recommends that the choice of treatment for initial hypertension should be ACEI/ARBS, thiazides, CCBs, BBs alone or in combination may also be preferred. Interview of patients or their representatives suggested that patient compliance to the medication was moderate and was better in females when compared to males.

Table 2: Distribution of patients with co-morbidities.

Co- morbidities	Number of patient (n = 208)	Percentage distribution
Diabetes	101	48.5
CVD	64	31.2
CKD	43	20.6

## DISCUSSION

The results of this study suggest that hypertension is more in male, compared to females. A previous study

reported that there was higher incidence of hypertension in females than in males in Germany<sup>3</sup>. This study also reveals that hypertension is more prevalent in elderly patients belonging to age groups 45-65 or more. It also shows that most frequently prescribed classes of drugs were ACEI/ARB alone or in combination. Since the eighth report of Joint National Committee (JNC8) on detection, evaluation prevention and treatment recommends the use of ACEI/ARB for management of early stage hypertension alone or in combination with other classes, thus suggesting that the above trends is in conformity to the recommendations of JNC 8 guidelines.

**Table 3: Utilization pattern of antihypertensive as monotherapy.**

Drug	Number of patients (n = 109)	Percentage Distribution
ARB/ ACEI	83	31.2
Diuretics	11	4.1
Calcium channel blockers	15	5.6

Hence this drug utilization data corroborated adherence to JNC 8 guidelines. Among the 2 drug regimen Diuretics +ACEI/ ARBs is the most widely prescribed regimen, while ACEIs/ARBs+ CCBs+ Diuretics was the most frequently prescribed three drug regimens.

**Table 4: Utilization pattern of antihypertensive class of drugs.**

Type of treatment	Number of patients	Percentage Distribution
Mono therapy	109	40.9
2 Drug Combination	95	35.8
3 Drug Combination	62	23.3

## CONCLUSIONS

The study concludes that the hypertension is more prevalent in males than in females, with its prevalence increasing with age. ACEIs/ARBs are the most frequently prescribed classes of drugs alone or in combination, supporting the adherence to JNC guidelines. Since the prevalence of hypertension depends upon ethnicity, genetic, environmental and physiological factors, further research is critically needed to set up a rationale or pattern for the choice of medication; on the basis of above mentioned factors.

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## AUTHOR'S CONTRIBUTION

**Kareem T:** writing original draft, methodology, investigation. **Sudha MJ:** formal analysis, data curation, conceptualization. **Ramani PT:** writing, review and editing. **Manakkalavalappil A:** methodology, formal analysis. **Parvathy G:** data curation, conceptualization. All authors revised the article and approved the final version.

## DATA AVAILABILITY

The data and material are available from the corresponding author on reasonable request.

## CONFLICT OF INTEREST

None to declare.

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