# A prospective observational study of prescription patterns of antihypertensive drugs in geriatric population in a tertiary care hospital

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## Abstract

**Introduction:** Hypertension is one of the major chronic diseases with high mortality and morbidity in today's world. The prevalence of hypertension increases with advancing age. In treating older hypertensive patients, clinicians should be alert to potential side-effects such as orthostatic hypotension and co-existing chronic conditions like Type 2 diabetes mellitus , ischemic heart disease etc.

**Objective:** To assess the drug utilization pattern of antihypertensive drugs in geriatric patients in a teaching hospital and to compare it with the JNC VIII guidelines.

**Methodology:** A single center prospective observational study was carried out for a period of 6 months in medicine out-patient department of BRIMS hospital. The prescription data obtained from study participants was evaluated as per JNC VIII guidelines.

**Results:** A total of 200 prescriptions were analyzed over 6 months. Average age of study population was 68.72 +/- 8.43 years. 56% were female patients. Mean number of antihypertensive drugs prescribed were 1.54+/- 0.62. Most of the patients (56%) were treated with a single antihypertensive drug. The use of calcium channel blockers was predominant in monotherapy as well as 2 or 3 drug regimens. Thiazides and β- blockers and anigiontensin receptor blockers/ angiotensin converting enzyme inhibitors were underutilized.

**Conclusion:** Our study shows that the most commonly prescribed drug class involved calcium channel blockers and the results were only partly in accordance with JNC VIII guidelines.

**Keywords:** prescription pattern, hypertension, antihypertensive drugs, geriatric population.

## 1. Introduction

In elderly, hypertension is defined as a sustained elevation in blood pressure. (SBP $>/= 140$ or $>/= 90$mmHg)[1]. Hypertension is the most common cardiovascular disease. As of 2000, nearly 1 billion people or about 26% of the world adult population suffered from hypertension [2]. Hypertension is one of the major causes of chronic diseases resulting in high mortality and morbidity in today's world [3]. The prevalence of hypertension increases with advancing age; about 50% of people aged between 60-69 years have hypertension and the prevalence is further increased beyond 70 years of age [4]. Also, the projected population growth of older patients will certainly increase the prevalence of hypertension in the elderly.

Elevated arterial pressure causes pathological changes in the vasculature and hypertrophy of the left ventricle. As a consequence, hypertension is the principal cause of stroke; a major contributor to cardiac failure, renal insufficiency and dissecting aneurysm of the aorta BP is more variable in older patients, often due to stiff large arteries and age related decrease in baroreflex buffering. Exaggerated BP drops may occur in the elderly during postural change, after meal and after exercise.

Irrational prescription of drugs is a common occurrence in clinical practice. Monitoring of prescription

components can identify problems while prescribing and provide feedback to prescribers. In view of these facts, this study was aimed to assess the prescriptions in the context of their adherence to JNC VIII guidelines.

### 1.1 Objective

To analyze the prescription pattern in geriatric hypertensive patients attending the medicine OPD of a tertiary care hospital and compare it with JNC VIII guidelines.

## 2. Material and Methods

### 2.1 Study Design and place of study:

A prospective observational study on prescribing patterns in Geriatric patients was carried out in BRIMS, Bidar in the department of General medicine.

### 2.2 Sample size

200 patients suffering from hypertension with or without co-morbidities.

### 2.3 Study period

6 months from July 2016 to Dec 2016

### 2.4 Study criteria

### 2.4.1 Inclusion criteria

Hypertensive patients aged 60 years and above of either gender with or without comorbidities.

Patients willing to participate and give informed consent in writing.

### 2.4.2 Exclusion criteria

1. Patients below the age of 60years
2. Patients who are critically ill and admitted to intensive care units

### 2.5 Procedure

After obtaining clearance from the institutional ethics committee, the patients eligible as study criteria were enrolled in the study. The information such as demographic data, medication and clinical data was collected and documented in specially prepared patient data collection form. The prescribing pattern of antihypertensive in patients with or without co-morbidities was assessed based on drug class, dosage and frequency of prescription. The prescribing pattern was compared with the prescribing guidelines (JNC VIII). Collected data was analyzed using descriptive statistics. Results were depicted in the form of graphs and percentages.

## 3. Results

200 patients were included in this study conducted over 6 months of duration.

**Table 1: Gender distribution**

|  | Number of patients | Percentage |
|---|---|---|
| Male | 88 | 44% |
| Female | 112 | 56% |

**Table 2: Age wise distribution**

| Age group | Number of patients | Percentage |
|---|---|---|
| 60-64 | 74 | 37% |
| 65-69 | 52 | 26% |
| 70-74 | 48 | 24% |
| 75-79 | 12 | 6% |
| >80 | 14 | 7% |

Average age: 68.72 +/- 8.43 years.

Total number of antihypertensive drugs= 308. Average number of drugs per prescription was 1.54+/- 0.62
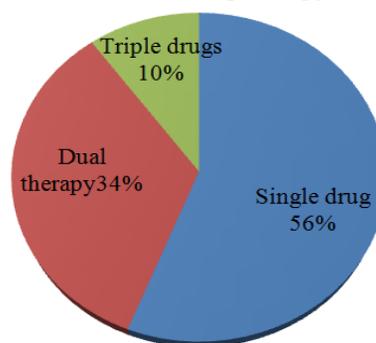


**Pattern of drug therapy**

Triple drugs 10% — Dual therapy 34% — Single drug 56%

**Table 3: Co-morbidities**

| Co-morbidities | Number of patients | Percentage |
|---|---|---|
| Type 2 diabetes | 84 | 72% |
| Ischemic heart disease | 52 | 26% |
| APD | 46 | 23% |
| Osteoarthritis | 28 | 14% |
| COPD | 02 | 1% |
| Others | 14 | 7% |

**Table 4: Single drug therapy=112**

| Drug class | Number of patients | Percentages |
|---|---|---|
| CCBs | 78% | 69.64% |
| Beta blockers | 16 | 14.28% |
| ARBs | 10 | 3.25% |
| ACEIs | 08 | 7.14% |

**Table 5: Dual drug therapy: 50**

| Class | Number of patients | Percentage |
|---|---|---|
| CCB+TDU | 22 | 44% |
| CCB+BB | 10 | 20% |
| CCB+ACEI | 06 | 12% |
| ACEI+DU | 04 | 8% |
| BB+DU | 03 | 6% |
| CCB+ARB | 02 | 4% |
| BB+ARB | 02 | 4% |
| BB+ACEI | 01 | 2% |

**Table 6: Triple drug therapy: 20**

| Drugs | Number of patients | Percentage |
|---|---|---|
| CCB+BB+DU | 8 | 40% |
| ACEI+CCB+BB | 6 | 30% |
| ARB+DU+CCB | 3 | 15% |
| BB+CCB+ARB | 2 | 10% |
| BB+ACEI+DU | 1 | 05% |

## 4. Discussion

Majority of our participants were in the age group of 60-69 years (63%), 30% were in the age range of 70-79 years while only 7% were >/= 80 years of age. A study conducted by Tiwari et al in hypertension population also showed a similar distribution with 75% being in the range of 60-69 years [6]. The age distribution of our study can be explained by the fact that the hospital consultations become relatively less common with increasing patient age. In our study 112 (56%) were females while 88 (44 %) were males.

The average number of anti-hypertensive drugs per prescription was 1.54+/- 0.62 which was similar to the mean number of drugs used by the patients in a study in China (1.45 +/- 0.66) [7]. The concurrent use of several drugs not only increases the chance of drug interactions in geriatric population but also leads poor compliance and ADRs [8].

56% of patients were treated with monotherapy. The JNC 7 guidelines also recommend implementing monotherapy as first line for most of the hypertensive patients and only if necessary, adding other drugs based on the level of control of BP. It also recommends caution in initiating therapy with multiple agents, particularly in older persons and in those at risk for orthostatic hypotension, such as diabetics with autonomic dysfunction [9]. In a study conducted by Reshma et al. geriatric patients were maximally on polytherapy. The overall utilization pattern of antihypertensives in our study showed that the maximum utilization was for calcium channel blockers (45.45 %), followed by Thaizide diuretics (18.18%) and β- blockers (15.90%) [10]. The other drugs less commonly used were ARBs (12.01%) and ACEIs (8.44%). These results were similar to a study done by Mateti et al., the most commonly prescribed monotherapy was with a calcium channel blocker, amlodipine which was prescribed to 69.64% of patients on treatment with monotherapy [11]. The results were similar to studies done in India and abroad [7, 11]. The maximum use of calcium channel blockers in our study is explained because of the fact that CCBs are well tolerated by elderly with deranged metabolic profile. This is in accordance with JNC 8 guidelines [12].

In two drug therapy, majority of patients were treated with a combination of CCB+ thiazdie diuretic (44%) followed by a combination of CCB+β blocker (20%). Most commonly used 3 drug combination used was that of CCB+BB+diuretic (40%) followed by ACEI+CCB+BB (30%) in triple drug regimen. On further analysis of our data, it was found that 42% of our patients had Type 2 DM while 26% were diagnosed with IHD. In spite of this, only 1/3 of the diabetic patients received ARB/ACEI for management of their BP. This could be due to an insufficient effect, intolerance or existence of certain contraindications

Overall, there was a clear dominance of CCB with thiazides, β- blockers, and ACEI/ARBS class of drugs being underutilized.

## 5. Conclusion

Among antihypertensive drugs prescribed for treating geriatric patients suffering from primary hypertension, most of the cases were prescribed with monotherapy followed by combine therapy. Our study shows that the most commonly prescribed anti hypertensive as monotherapy was CCB (amlodipine) followed by β-blockers.

Overall the prescribing was only partly in accordance with JNC-8

## References

[1] Jayanth  K B, Sunil K R. Prescribing Pattern for Treatment of Diabetes Mellitus Type 2 with Hypertension: An Analysis Of Cost Effectiveness 2014; 4(2): 2249-3387

[2] Kearney P M, Whelton M, Reynolds K, Muntner P, Whelton PK, Hej global burden of hypertension : analysis of worldwide data. *Lancet* [Internet]. [Cited 2012 Nov. 23]; 365 (9455):217-23 available from www.hcbi.nlm.nih.gov/pubmed/1565 2604.

[3] Global Health Risks: Mortality and burden of diseases attributable to selected major risks [Internet]. WHO 2009 [cited 2012 Oct 1]. Avalable from: who.int/helthinfo/ global-burden-disease/ Global health risks-report –full.pdf.

[4] Chobanin A, Bakris G, Black H, Cushman W, Green L, I$_{220}$ JJ. The seventh report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure. The JNC7 Report. *JAMA*, 2003; 289: 2560-72.

[5] Jeffery M, Hypertension guidelines- Revisiting the JNC-7 recommendations. *The J. of Lancaster General Hospital,* 2008; 3(3); 91-97.

[6] Tiwari H, Kumar A, Kulkarni SK. Prescription monitoring of anti-hypertensive drug utilization at the Punjab University Health Centre in India. *Singapore medical Journal [Internet]*. 2004 Mar; 45(3); 117-20. Available                                        from: www.ncbi.nlm.nih.gov/pubmed/15029413

[7] Cheng H. prescribing pattern of antihypertensive drugs in a general hospital in central China. *International Journal of Clinical Pharmacy* 2011 Apr [cited 2012 Nov 24]; 33(2); 215-20. Available from: www.ncbi.nim.nih.gov/pubmed/21369960

[8] Werder SF, Preskorn SH. Managing Polypharmacy: Walking thefine line between help and harm. *The Journal of Family Practice*. 2003; 2(2). Available from www. jfponline.com

[9] Mc lean AJ, LeCouteur DG. Aging biology and geriatric clinical pharmacology. *Pharamocological Reviews*. 2004; 56(2): 163-84

[10] Reshma et al. Prescribing pattern of Antihypertensives in Geriatric and Non–geriatric Individuals- a Comparative Study. *International Journal of Pharma and Bio Sciences* 2012; 3(2):320-6.

[11] 11) Mateti U et al. A study on prescribing patterns of antihypertensives in geriatric patients. *Perspectives in Clinical Research*. Medknow Publications and Media Pvt. Ltd. 2012 Oct 7; 3(4):139.

[12] James PA, Operil SA, Carter BL et al. 2014 evidence-based guideline for management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA* [Internet] 2014 Feb; 311 (5): 507-52.