

Prescribing patterns of antihypertensive drugs in geriatric population in tertiary care hospital

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Abstract

Hypertension is one of the major chronic diseases with high mortality and morbidity in the today's world. Present study was to assess the prescribing pattern of antihypertensive medications in geriatric population suffering mainly from hypertension with or without co morbidities like Diabetes Mellitus (DM). A prospective observational study was carried out for a period of six months in an in-patient general medicine department. Elderly patients who have been diagnosed with pure hypertension as per JNC 7 guidelines and hypertension with co- morbid condition like diabetes mellitus and patients receiving or prescribed with antihypertensive drugs were included. A total of 150 prescriptions were analyzed. The present study revealed that there were 93 patients with pure Hypertension and 57 patients with co morbid conditions like Diabetes Mellitus (DM). Among antihypertensive drugs in pure hypertensive cases, 53.76% of cases were prescribed with monotherapy, followed by 46.23% by combination therapy. The commonly prescribed antihypertensive monotherapy is calcium channel blockers. The most commonly prescribed combination therapy in severe cases was angiotensin receptor blockers with diuretics. This prescribing pattern of antihypertensives was as per Joint National Committee-7 report on hypertension. In case of geriatric patients suffering from hypertension with Type 2 diabetes mellitus, most commonly prescribed antihypertensive as monotherapy was found to be amlodipine and combination therapy was telmisartan + hydrochlorothiazide.

Keywords: Hypertension, Prescribing, Geriatrics, antihypertensives.

1. Introduction

In elderly, the hypertension (HTN) is defined as the sustained elevation in blood pressure (systolic blood pressure of ≥ 140 mmHg or a diastolic blood pressure of ≥ 90 mmHg) [1]. Hypertension is one of the common factors that affect the morbidity and mortality of numerous chronic diseases namely congestive cardiac failure, stroke, and end stage renal disease [2]. Prevalence of HTN in India is reported to vary from 4 to 15% in urban and 2 to 8% in rural population [3]. The prevalence of HTN increases with advancing age [4]. Increasing age is associated with changes in the structure of walls of the blood vessels that produce loss of vascular compliance, and it affects the size and volume of the lining of the arteries and ultimately results in hypertension [5]. A large number of antihypertensive drugs, either as alone or in various combinations are available and physicians need to choose the most appropriate drug for a particular patient. The choice of drugs for a particular patient changes at short intervals because of factors like efficacy, side effects, cost and development of newer drugs [6]. According to the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and treatment of High Blood Pressure, the current guidelines suggest that greater than or equal to 1 antihypertensive agents is required in most patients with hypertension to reach BP goals that will effectively reduce the cardiovascular risk [7]. The frequency of hypertension in diabetic population is almost twice as compared to non-diabetic general population. Diabetes and hypertension are the two faces of the same coin and they co-exist to the tune of 20-60% depending upon obesity, ethnicity, and age of the person. Hypertensive patients with diabetes have lower rates of blood pressure control and often require combination therapy. Many studies proven that combination of two or more drugs are essential in effectively controlling hypertension in hypertensive patients with Type 2 diabetes mellitus [8]. Irrational prescription of drugs is a common occurrence in clinical practice. Monitoring of prescriptions components can identify the problems while prescribing and provide feedback to prescribers [9]. In view of these facts, this study was aimed to assess the prescriptions in the context of their adherence to prescription format, to evaluate the study of prescribing pattern of antihypertensive medications in geriatric population suffering from hypertension with or without diabetes mellitus, to classify hypertension according to severity and compare the prescribing patterns with standard guidelines.

2. Materials and Methods

2.1 Study site: A Prospective Observational study on prescribing patterns in Geriatric patients was carried out in MVJ Medical College and Research Hospital, Hoskotte, Bangalore in the department of General Medicine.

2.2 Sample size: 150 Geriatric patients suffering from Hypertension with or without co morbidities like Type2 Diabetes Mellitus.

2.3 Study period: 6 months

2.4 Study Criteria:

Inclusion criteria:

- Hypertensive inpatients aged 60 years and above of either gender suffering from hypertension with or without co-morbidities such as Diabetes Mellitus (DM)

Exclusion criteria:

- Intensive Care Unit patients having HTN.
- Patients who are uncooperative or not willing to participate.

2.5 Case Record Form

A separate data entry format for incorporating patient's details was designed. The format contains the details such as Name, Age, Gender, IP number, Date of admission (DOA), social history, socioeconomic status, status of living, Patient past Medical and Medication history, Laboratory investigations, Drugs prescribed and the Prescription Analysis.

2.6 Procedure:

A prospective observational study was conducted in the department of General Medicine, (Inpatient wards) in M.V.J medical college and research hospital. The human ethical clearance is obtained before conducting the study. The patients who are satisfying study criteria reenrolled into the study. The informed consent is obtained from each patient who is enrolled as per the study criteria. The information such as demographic, medication and clinical data is collected and documented in specially prepared patient data collection form. The prescribing pattern of antihypertensive with or without co-morbidities (DM) is assessed based on drug class, dosage, Frequency, route, generic, duration and severity of HTN. The prescribing pattern of antihypertensives is compared with the prescribing guidelines (JNC-7). The prescribing pattern of antidiabetic medications is assessed based on drug class, dosage, Frequency, route of drugs administered.

2.6 Statistical Analysis

The collected data will be analyzed using descriptive statistics. Results will be depicted in the form of percentage and graph.

3. Results

A total number of 150 prescriptions from 150 patients were observed and the following evaluations were made from the observed data. Hypertension was diagnosed based on the JNC-7 guidelines.

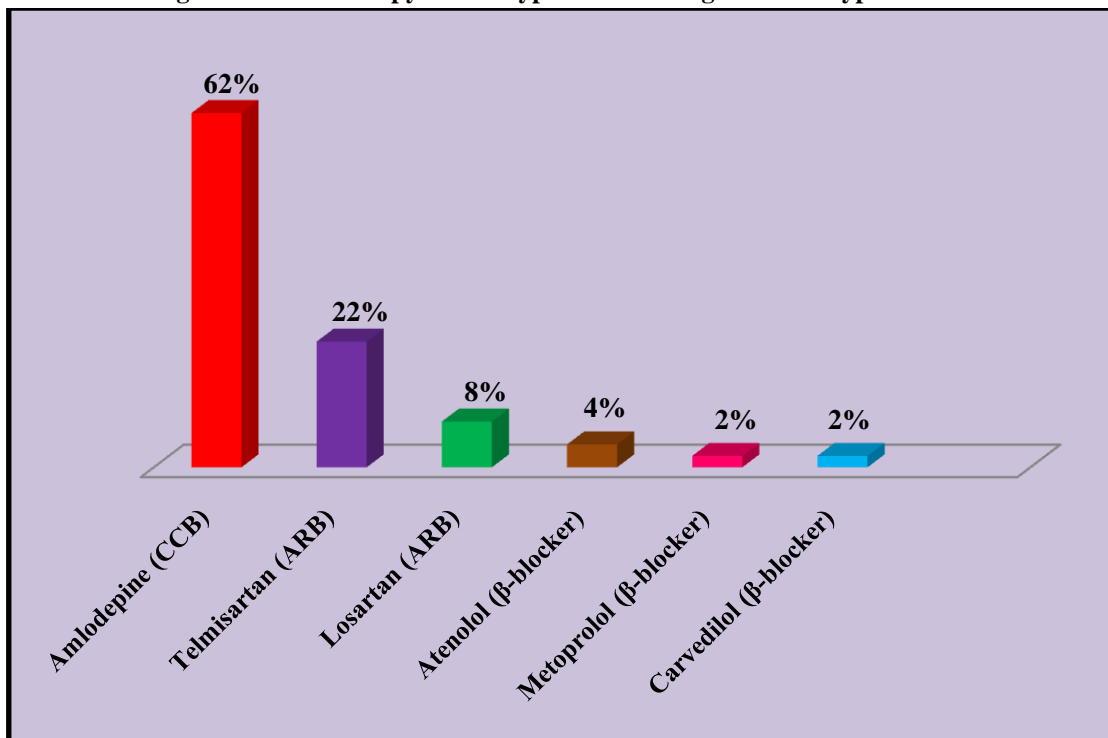
Table 1: Prescriptions Observation

Particulars	Number	Percentage
Total number of enrolled patients	150	150%
Number of male patients	80	53.30%
Number of female patients	70	46.60%
Number of Young Elderly patients (60-65 years)	68	45.30%
Number of Middle Elderly patients (66-75 years)	53	35.30%
Number of Old Elderly patients (>76 years)	29	19.30%
Patient distribution based on diagnosis:		
(a)Hypertension	93	62%
(a)Hypertension with diabetes mellitus	57	38%
Patient distribution based on stages of Hypertension:		
(a)Mild Hypertension	60	40%
(a)Moderate Hypertension	56	37.30%
(a)Severe Hypertension	34	22.60%
Drug distribution therapy of antihypertensive drugs in hypertension:		
(a)Monotherapy	50	53.76%
(a)Combination therapy	43	46.23%
Drug distribution therapy of antihypertensive drugs in hypertension with T2DM		
(a)Monotherapy	37	64.91%
(a)Combination therapy	20	35.08%
Prescription based on generic name or brand name:		
(a)Brand names	121	80.60%
(a)Generic names	18	12%
Number of prescriptions mentioned with 'Adv' or 'Rx':		
(a)Adv	133	88.60%
(a)Rx	17	11.30%

3.1 Monotherapy of Antihypertensive Drugs in Pure Hypertension

Out of 93 prescriptions from the General Medicine department, 50 were found to be prescribed with monotherapy, in which the antihypertensive drugs prescribed in pure Hypertensive patients were Amlodipine 31 (62%), Telmisartan 11 (22%), Losartan 4 (8%), Atenolol 2 (4%), Metoprolol 1 (2%) followed by Carvedilol 1 (2%).

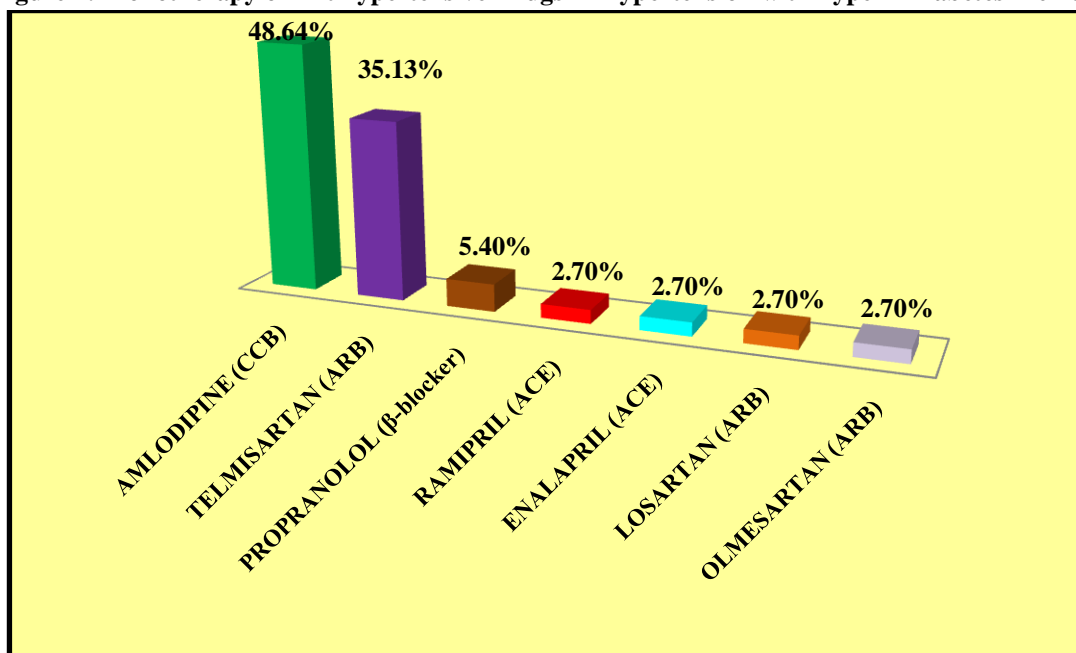
Figure 1: Monotherapy of Antihypertensive Drugs in Pure Hypertension



3.1 Monotherapy of Antihypertensive Drugs in Hypertension with Type II Diabetes Mellitus

Out of 57 prescriptions from the General Medicine department, 37 were found to be prescribed with monotherapy, in which the antihypertensive drugs prescribed in pure Hypertensive patients were Amlodipine 18 (48.64%), Telmisartan 13 (35.13%), Losartan 1 (2.7%), Propranolol 2 (5.4%), Ramipril 1 (2.7%) Enalapril 1(2.7%) followed by Olmesartan 1 (2.7%).

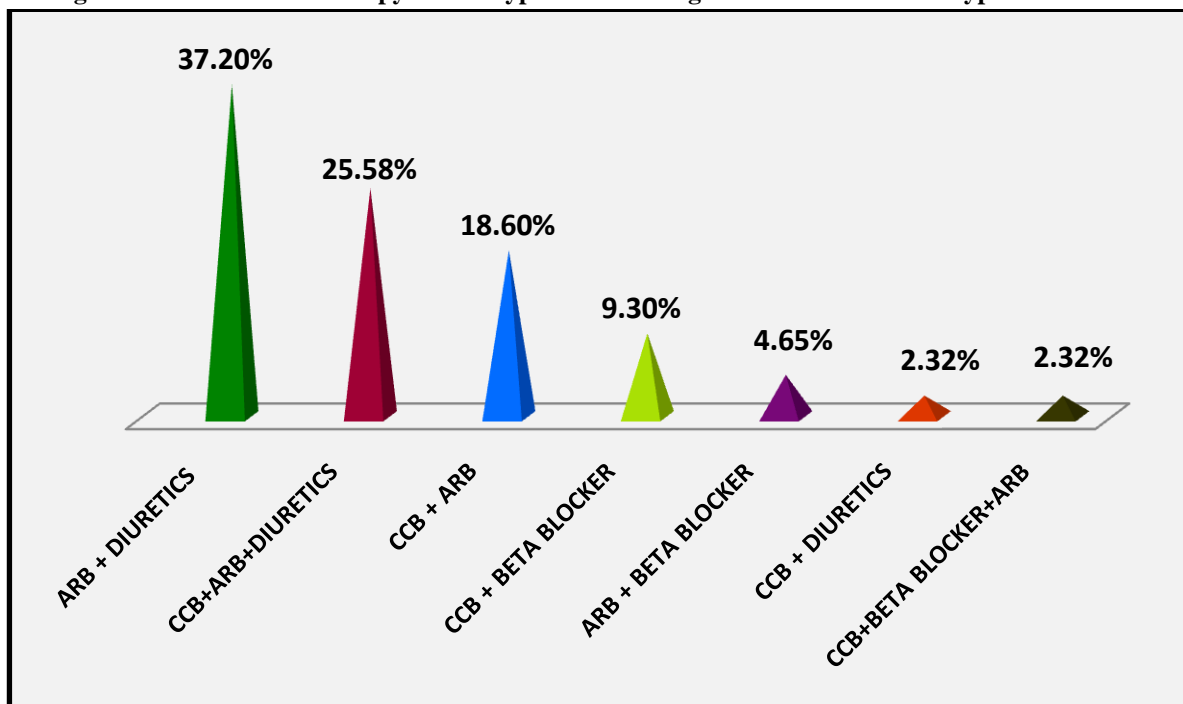
Figure 2: Monotherapy of Antihypertensive Drugs in Hypertension with Type II Diabetes Mellitus



3.2 Combination therapy of Antihypertensive Drug Distribution in Pure Hypertension

Out of 93 prescriptions, from the General Medicine department, 43 were found to be prescribed with combination therapy, in which the antihypertensive drugs prescribed in pure Hypertensive patients were **ARB + Diuretics** 16 (37.20%), **CCB+ ARB+ Diuretics** 11 (25.58%), **CCB+ ARB** 8 (18.60%), **CCB+ β -Blocker** 4 (9.3%), **ARB + β -Blocker** 2 (4.65%), **CCB+ Diuretics** 1 (2.32%) followed by **CCB+ β -Blocker+ ARB** 1 (2.32%).

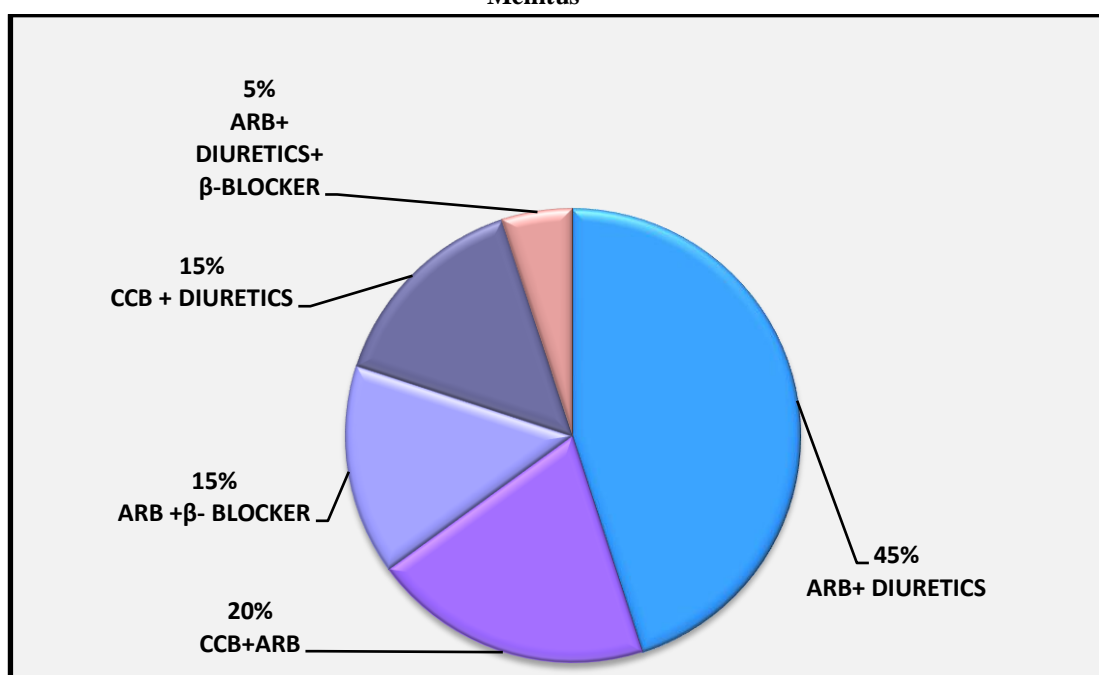
Figure 3: Combination therapy of Antihypertensive Drug Distribution in Pure Hypertension



3.2 Combination therapy of Antihypertensive Drug Distribution in Hypertension with Type II Diabetes Mellitus

Out of 57 prescriptions, from the General Medicine department, 20 were found to be prescribed with combination therapy, in which the antihypertensive drugs prescribed in Hypertensive patients with T2DM were **ARB + Diuretics** 9 (45%), **CCB+ ARB** 4 (20%), **ARB + β -Blocker** 3 (15%), **CCB+ Diuretics** 3 (15%) followed by **Diuretics+ β -Blocker+ ARB** 1 (5%).

Figure 4: Combination therapy of Antihypertensive Drug Distribution in Hypertension with Type II Diabetes Mellitus



4. Discussion

Prevalence of hypertension in India in 2000 was 60.4 million males and 57.8 million females and projected to increase to 107.3 million and 106.2 million respectively in 2025. The prevalence of hypertension in diabetic patients (30-50%) is approximately twice as that in the non-diabetic population (15-20%), in view of these facts, we aim to evaluate the study of prescribing pattern of antihypertensive medications in geriatric population suffering from hypertension with or without diabetes mellitus, to classify hypertension according to severity and compare the prescribing patterns with standard guidelines. In our study, it has been seen that hypertension is a common problem for people with diabetes, 62% patients of hypertension have been diagnosed with pure hypertension, followed by 38% with co-morbid condition like type 2 diabetes mellitus. Our study reveals that, people are more prone to mild hypertension (40%) than moderate (37%) followed by severe hypertension (23%) which is same as the previous study conducted by Pavani [10]. Monotherapy is defined as a prescription of one or two agent within the same class of drug. In our study, out of 93 pure hypertensive cases, 53.76% were prescribed with Monotherapy and the most commonly prescribed drugs in the study population were amlodipine (62%), telmisartan (22%), losartan (8%), atenolol (4%), Metoprolol (2%) and Carvedilol (2%). These results were compared with Datta *et al* and Almas *et al* conducted at tertiary care hospital shown that calcium channel blocker-Amlodipine is the most commonly used antihypertensive Monotherapy [11].

Combination therapy is defined as a prescription of more than one agent from two classes of drug, including two agents in one formulation. In our study, out of 93 pure hypertensive cases 46.23% were prescribed with combination therapy and the most commonly prescribed angiotensin receptor blockers + diuretics drugs in the study population were telmisartan +hydrochlorothiazide(13), losartan + hydrochlorothiazide (2) and Olmesartan + hydrochlorothiazide (1), the most commonly prescribed CCB + Diuretics drugs are amlodipine + hydrochlorothiazide (1). In our study, the most commonly prescribed CCB + β - blocker were amlodipine + atenolol (3), amlodipine + Metoprolol (1), commonly prescribed CCB + ARB Drugs are amlodipine + telmisartan (7), amlodipine + losartan (1) followed by ARB + β - blocker drugs like telmisartan + Carvedilol (2) were prescribed. In case of hypertension with co-morbid conditions like type 2 diabetes mellitus, Monotherapy (65%) is more prescribed than combination therapy (35%). Calcium channel blockers (49%) are the most commonly prescribed Monotherapy than ARB (41%) followed by ACE inhibitors (5%) and β - blockers (5%), most commonly prescribed drugs in the study population were amlodipine (48.64%), telmisartan (35.13%), and losartan (2.7%), Propranolol (5.4%), Enalapril (2.7%), Ramipril (2.7%) and Olmesartan (2.7%). Out of 20 cases prescribed with combination therapy, ARB + Diuretics are the most commonly prescribed combination antihypertensives in HTN + Type 2 DM (9) than CCB + ARB (4), ARB + β - blockers (3), followed by CCB + Diuretics (3) and ARB + Diuretics + β - blockers (1). The most commonly prescribed combination antihypertensives in HTN + Type 2 DM is telmisartan + hydrochlorothiazide (5).

150 prescriptions of antihypertensive drugs were prescribed according to JNC-7 guidelines which was same as the study conducted by the Bajaj J K *et al.* on prescription patterns of antihypertensive drugs and adherence to JNC-7 guidelines in a tertiary care hospital in north India. 150 prescriptions were found to be legible, the route, frequency and dose of the drug administered were mentioned and follow up date was mentioned in 150 patient case sheets.

5. Conclusion

Among antihypertensive drugs prescribed for treating geriatric patients who were suffering from pure hypertension, most of the cases were prescribed with monotherapy followed by combination therapy. Our study shows that the most commonly prescribed antihypertensive as monotherapy in mild hypertension was calcium channel blocker, especially amlodipine, followed by angiotensin receptor blocker, telmisartan.

The most commonly prescribed combination therapy in severe cases was angiotensin receptor blockers with diuretics, telmisartan with hydrochlorothiazide. This prescribing pattern of antihypertensives was as per Joint National Committee-7 report on hypertension treatment guidelines for geriatrics population. In case of geriatric patients suffering from hypertension with Type 2 diabetes mellitus, most commonly prescribed antihypertensive as monotherapy was found to be amlodipine.

Among antihypertensive combination therapy, Telmisartan + Hydrochlorothiazide was found frequently prescribed. All the components of the prescriptions collected from the patients suffering from hypertension with or without diabetes mellitus were legibly written by the physicians from the department of general medicine.

Acknowledgment

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