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Prescribing pattern of antihypertensive in hypertensive patients with compelling indication

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Abstract

Aim: The aim of the study is to assess the various prescribing patterns in hypertension and compiling indications with JNC 8 guidelines.

Objective: To assess the prescribing pattern in hypertensive patients and to evaluate the rationality in regards to JNC-8 Guidelines in a tertiary care hospital.

Methods: It was a prospective, observational study conducted for 3 months in 250 hypertensive prescriptions with comorbidities who get admitted in the hospital were screened for the study. The data collected from the participants was entered into Microsoft excel spreadsheet.

Results: A total of 250 hypertensive patients with different comorbidities were included in which 140 males and 110 females. The most commonly reported first three co-morbidities along with hypertension were diabetes mellitus 139 (55.6%), and coronary artery disease 48 (19.2%). Monotherapy was given in almost 166 (66.4%) patients and dual drug therapy was indicated in 52 (20.8%) patients, triple therapy was used only in 7 (2.8%) patients in the total sample size. Quadruple therapy is not preferred combination therapy which accounts only in 25(10%) patients.

Conclusion: We conclude that calcium channel blockers and angiotensin II receptor blockers were the most frequently prescribed class of drugs; moreover single or in combination with other class of drugs for effective control of blood pressure patients with different compelling indications. Monotherapy was preferred than combination therapy.

Keywords: Hypertension, Comorbidities, Prescribing patterns, Diabetes mellitus.

1. Introduction

Hypertension is a disorder that if not efficiently treated outcome in greatly increased probability of coronary thrombosis, strokes, and renal failures. It is predictable that the prevalence of hypertension in India is about 25% among urban adults and 10% in the rural areas. The lifetime risk of mounting hypertension is estimated to be 90%. [1] Many studies in urban and rural areas of India have been carried out and these have shown steadily increasing trend of hypertension in India. [2,3]

The guidelines of hypertension and cardiology societies emphasize that hypertension treatment should aim at reducing the long-term risk of morbidity and mortality. [4,5] Systemic hypertension is the single largest contributor to death worldwide.

Hypertension is a common healthcare problem. The incidence among adult population has been estimated to range from 4.75% to 25.6% and constitutes 1.8% to 3.8% of total consultations in primary health center. Because of different types of adverse reactions, benefit, contraindications, and cost of the choice of appropriate drug is very important one. [6] High Blood pressure remains a major risk factor for premature death and disability. 62% of Stroke and 49% of myocardial infarctions has been attributed with increased risk of elevated blood pressure. [7]

Antihypertensive drugs are chosen nowadays based on their efficacy, adverse effects, and the cost of drugs available. Accordingly, a need to survey the pattern of usage of antihypertensive drugs is must, to see if the current usage is rational and in concordance with current

guidelines for treatment of hypertension. [8] A huge number of antihypertensive drugs alone or in different combinations are available and physicians need to choose the most appropriate drug for a particular patient.

A wide range of antihypertensive drugs belonging to different pharmacological classes are available such as angiotensin converting enzyme inhibitors, beta blockers, angiotensin receptor blockers, calcium channel blockers, diuretics, alpha-adrenergic blockers and central sympatholytics. Selection of drugs for particular patient changes at tiny intervals because of factors like efficacy, side effects, cost and development of newer drugs.

As per JNC-8 report, persons older than 50 years, systolic blood pressure of more than 140 mmHg is more significant for cardiovascular disease and it recommends life style modifications to prevent cardiovascular disease. Thiazide diuretics are used for uncomplicated hypertension, followed by ACEIs, angiotensin blockers receptors, calcium channel blockers are used.[9] Polypharmacy was observed as one of the reason for variations in disease state. [10] Therefore this study was carried out with the aim of analyzing the pattern of antihypertensive drugs being prescribed in a tertiary care hospital.

2. Methodology

2.1 Study design: It is a prospective observational study.

2.2 Study period: The present study was carried out for a period of 3 month from March-2018 to May-2018.

2.3 Study site: The present study was conducted at tertiary care hospital, Bangalore, Karnataka.

2.4 Source of data: All the patients satisfying the inclusion criteria were selected from medical inpatient. All the required data was collected from patients through prescriptions.

2.5 Sample size: The total sample size was 250.

2.6 Inclusion criteria

- Patients of either sex are included
- Age above 25 years.
- Patients with any co-morbidities

2.7 Exclusion criteria

- Pregnant women and children are excluded.
- Chronic kidney disease (CKD) patients are excluded.

3. Results

Table 1: Sample Distribution Based On Gender: (n= 250)

S. No	Gender	No of Patients With Hypertension	Percentage of Patients With Hypertension
1	Male	140	56%
2	Female	110	44%

Table 2: Different Age Groups In Study Sample: (n=250)

S. No	Age Group	No of Patients With Hypertension	Percentage of Patients With Hypertension
1	40-50	18	7.2%
2	51-60	43	17.2%
3	61-70	116	46.4%
4	71-80	58	23.2%
5	81-90	15	6%

Table 3: Common Comorbidities with Hypertension: (n=250)

S. No	Comorbidities	No of Patients With Hypertension	Percentage of Patients With Hypertension
1	DM	139	55.6%
2	CVA	26	10.4%
3	CAD	48	19.2%
4	CCF	14	5.6%
5	Others	23	9.2%

DM: Diabetes mellitus, CVA: Cerebrovascular accident, CAD: Coronary artery disease, CCF: Congestive cardiac failure,

Table 4: Monotherapy and Combination Therapy (n=250)

S. No	Treatment	No of patients with Hypertension	Percentage of patients with Hypertension
1	Monotherapy	166	66.4%
2	Combination Therapy	25	10%
3	Dual Therapy	52	20.8%
4	Triple Therapy	7	2.8%

Table 5: Different Class of Drugs Commonly Used In monotherapy: (n=166)

S. No	Class of Drugs	No of patients with hypertension	Percentage of patients with hypertension
1	CCB	56	33.7%
2	ARB	41	24.69%
3	ACE	13	7.83%
4	B BLOCKER	36	21.68%
5	DIURETIC	14	8.43%
6	ALPHA BLOCKER	6	3.61%

CCBs: Calcium Channel Blockers; ARBs: Angiotensin Receptor Blockers; ACE: Angiotensin converting enzymes.

Table 6: Different Class of Drugs Used In Dual Therapy: (n=52)

S. No	Class of Drugs	No of patients with hypertension	Percentage of patients with hypertension
1	A+C	12	23.07%
2	B+C	11	21.15%
3	C+E	5	9.61%
4	C+D	8	15.38%
5	A+D	5	9.61%
6	B+D	4	7.69%
7	A+B	5	9.61%
8	E+D	4	7.69%

A-Angiotensin II receptor blocker; B-β-blockers; C-Calcium channel blockers; D-Diuretics; E-ACE-Inhibitors

Table 7: Different Class of Drugs Used In Triple Therapy: (n=7)

S. No	Class of Drugs	No of Patients with hypertension	Percentage of patients with hypertension
1	C+E+D	3	42.8%
2	A+B+D	1	14.28%
3	A+C+D	2	28.57%
4	A+D+E	1	14.28%

A-Angiotensin II receptor blocker; B-β-blockers; C-Calcium channel blockers; D-Diuretics; E-ACE-Inhibitors

Table 8: Appropriateness of Compiling Indications with JNC 8 Guidelines: (n=250)

S. No	Class	No of Patients	No of Percentage
1	Approriateness	217	86.8%
2	Inappropriateness	33	13.2%

4. Discussion

A total of 250 hypertensive patients with different comorbidities were included in which 140(56%) males and 110(44%) females were present as shown in Table 1.

All the patients with hypertension were divided into different age groups to recognize the commonly affected age group. Majority of patients were found to be in the age group of 61-70y were 116 (46.4%), followed by 58 (23.2%) in the people with>70y, were represented in Table 2.

Hypertension is not a single disease that affects one system and it is the most important cause for many other diseases, therefore we have assessed different co-morbidities along with hypertension in this study. The most commonly reported first three co-morbidities along with hypertension were diabetes mellitus 139 (55.6%), CAD accounts for 48 (19.2%) and CVA in 26 (10.4%). (Table 3)

We classified the hypertensive patients based on drug therapy into four categories like patients on Monotherapy (166), Dual (52), Triple (7) & Combination therapies (25). (Table 4)

In the present study, we categorize the hypertensive patients based on drug therapy into four categories like patients on Monotherapy, dual, triple & quadruple therapies along with the different commonly observed comorbidities. According to present study the compelling indication of hypertension, diabetes mellitus 55.6% was most common, it was supported by Preethi *et al* [11] the study found that diabetes mellitus 38.71% was most common.

According to the Joint National Committee (JNC) 8 guidelines, these are the preferred class of drugs for patients with different compelling indications like diabetes mellitus, stroke and coronary artery disease. In our study, the similar was observed, i.e., irrespective of co morbidity and combination therapy, calcium channel blockers and angiotensin II receptor blockers were most commonly prescribed.

In the present study, monotherapy was given in almost 166 (66.4%) patients prescribed with CCBs (33.7%) followed by ARBs (24.69%), beta-blockers (21.68%) and ACE inhibitors (7.83%). These results supported by Mohammad Arief *et al* [12] study found that among 250 patients, 166 patients received monotherapy and only 25 patients received a combination therapy. (Table 5)

In present study, dual drug therapy was given in 52 (20.8%) patients and the most commonly prescribed dual therapy regimen were angiotensin II receptor blockers+calcium channel blockers in 23.07 % followed by β blockers+calcium channel blockers in 21.15% and calcium channel blockers+diuretics in 15.38% along with different combinations Anand Kale *et al* [13]. (Table 6)

The study initiate that two-drug combinations, a diuretic with angiotensin receptor blocker (29.5%) was most commonly prescribed followed by a ß blocker with a calcium channel blocker (22.1 %). Appropriateness of compelling indications with JNC 8 Guidelines which shows 86.8% and inappropriateness of 13.2 %. (Table 8)

5. Conclusion

We conclude that calcium channel blockers and angiotensin II receptor blockers were the most frequently prescribed drugs either alone or in combination with other class of drugs for efficient control of blood pressure in different comorbid conditions. Calcium channel blockers (CCBs) may be useful to diabetes, predominantly as part of combination therapy to control blood pressure as well as reduce the risk of cardiovascular disease (CVD) events in diabetes. Angiotensin II receptor blockers (ARBs) are more valuable in antihypertensive regimens.

Monotherapy was preferred than combination therapy. These two classes of drugs diminish the complications associated with hypertension. Prescribing patterns of antihypertensive drugs were in concordance with joint national committee (JNC) 8 guidelines for patients with different compelling indications.

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