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ANTIHYPERTENSIVE DRUG PRESCRIPTION IN ADMITTED PATIENT IN MEDICINE DEPARTMENT OF A TERTIARY CARE HOSPITAL

[1]Dr. Asha Pathak[*], [2]Dr. Arvind Maurya, [3]Pankha Chaudhary, [4]Dr. Atul Jain, [5]Dr. Seema Dayal and [6]Dr. Neeraj Rajdaan

[1*]Asssoc. Prof. Deptt. of Pharmacology UPRIMS & R, Saifai-Etawah.
[2]Junior Resident Deptt. of Pharmacology UPRIMS & R, Saifai-Etawah.
[3]Demonstrator Deptt. of Pharmacology UPRIMS & R, Saifai-Etawah.
[4]Prof. Deptt. of Pharmacology UPRIMS & R, Saifai-Etawah.
[5]Asssoc. Prof. Deptt. of Pathology UPRIMS & R, Saifai-Etawah.
[6]Junior Resident Deptt. of Pharmacology UPRIMS & R, Saifai-Etawah.

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***Correspondence for Author**
Dr. Asha Pathak
Asssoc. Prof. Deptt. of Pharmacology
UPRIMS & R, Saifai-Etawah.

ABSTRACT

The current study aimed to know the prescribing patterns of antihypertensive drugs in various age group of hypertensive patients in a tertiary care hospital of western U.P. Data were obtained from a prospective series of 526 patients of either sex by taking history and treatment files of admitted patients in medicine department, in which only 108 patient having hypertension. The collected data were analyzed for demographic profiles and prescribing patterns of anti-hypertensive drugs in patients of hypertension and with other diseases with hypertension. The results were analyzed and tabulated statistically. P value <0.05 is considered significant. The present study showed that diuretics were the drugs of choice for hypertensive patients in admitted patient as a single drug therapy and overall utilization. Utilization of diuretics in the present study was 32.5% as mono therapy it becomes 60.3% when adding combined therapy. The study showed that 43.49% percentage were found to be on dual therapy and among them 19.4% were found to be treated with fixed dose combination i.e. ARB+ Diuretic followed by beta blockers +CCBs and extended release beta blockers and the reduction of both Systolic and Diastolic Blood Pressure was found to be significant with these combinations and the

pattern is according to JNC guidelines. The study revealed that the prescription of anti-hypertensive medication is according to JNC guidelines.

KEYWORDS: Hypertension, diuretics, ARB, ACE, Prescription.

INTRODUCTION

Hypertension is one of the most common chronic disorders in the developed countries and it is the most important risk factor for cardiovascular morbidity.[1-5]

Hypertension is a common disease characterised elevated systolic blood pressure is above 139 mm Hg and the diastolic blood pressure is above 89 mmHg, Recommended criteria for a diagnosis of hypertension, based on 24-h blood pressure monitoring, are average awake blood pressure ≥135/85 mmHg and asleep blood pressure ≥120/75 mmHg. These levels approximate a clinical blood pressure of 140/90 mmHg6, persistently which may be asymptomatic at times of diagnosis. Hypertensive disorder is classified in two category, primary or Essential hypertension and secondary hypertension. In the majority of cases, a specific underlying causative factor of hypertension is not known. Those patients are said to have essential hypertension. About 10% of hypertensive patient having raised blood pressure secondary to a diseases like diabetes mellitus, renal vascular stenosis, pheochromocytoma etc. Hypertension is an important risk factor for cardiovascular morbidities such as angina pectoris, myocardial infarction, heart failure, arrhythmias and for renal complications with shortened expectancy and quality of life. In this context, the use of established anti-hypertensive medication assumes paramount importance. The general principles of antihypertensive management follow the guidelines of JNC VII and WHO & ISH.[7] [JNC VII -The Seventh Report of Joint National Committee of USA on Prevention, Detection, Evaluation and Treatment of High Blood Pressure; WHO & ISH - World Health Organisation and International Society of Hypertension]. It is estimated that 972 million adults were suffering from hypertension worldwide, with 66% of affected population belong from low and middle socioeconomic countries. It is estimated that the world wide prevalence of hypertension would increase from 26.4% in 2000 to 29.2% by the year 2025.[8] Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India. The ultimate goal of antihypertensive drug treatment is to minimize the morbidity, complications and mortality associated with chronic hypertension. Another approaches also considered like modification in life style, salt restricted diet as well as risk factor if any.[9]

Treatment of Hypertension

There are many medications for management of hypertension available including diuretics, beta-blockers, alpha blockers, ACE-inhibitors (ACEI), Angiotensin receptor blockers (ARBs), calcium channel blockers (CCB), vasodilators etc. The selection of anti-hypertensive agents is depends on the patient's age, sex, other organ involvement, laboratory finding and other associated diseases and their clinical profile.

The current study aims was study of antihypertensive drug utilization pattern in a North Indian tertiary care hospital to evaluate factors governing the prescribing, dispensing, administering of medication and its associated events like success or failure or associated adverse reaction.[10]

Methodology

All the prescriptions files including diagnosis of essential as well as secondary hypertension were analyzed. Prescriptions for hypertension with other co morbid conditions were also included.

Type of study

This is a prospective cross sectional study of six month duration from January 2015 to June 2015.

Place of study

This prospective study was conducted in medicine department of UPRIMSNR, Saifai Etawah Uttar Pradesh after getting approval from the Institutional Ethical Committee, Data were collected from a prospective series of 526 admitted patients of either sex from Medicine Department. The protocol was prepared as per the guideline of JNC-VII.[11] The demographic data was collected from each patient enrolled for this study.

Inclusion criteria

- The data were collected from all the admitted patients of either sex with primary as well as secondary hypertension in medicine inpatient departments who were give consent to participate in the study.

Exclusion criteria

Patients below the age of 18 years and those are unconscious and female patients with pregnancy.

METHODS

Analyzing the above prescriptions the following indicators were noted

a. Male: Female ratio.
b. Average age of Male and Female.
c. Average number of drugs per prescription.
d. Recording of prescriptions with mono-therapy and combination therapy for HTN patients and those with HTN & DM. By using the above indicators data analysis was done.

RESULTS

Demographic profile of the study population

During the period of our study a total number of 213 patients with hypertension (primary as well as secondary) were screened. Among these patients the nature of antihypertensive drugs was not known in 24 cases.

Table-1: Age and sex variation.

Age groups (in years)	Males n=99	Females n=90	Total patients n=189
30-39	3	1	4
40-49	14	12	26
50-59	25	21	46
60-69	35	34	69
70-79	22	22	44
Total	99	90	189

Table no.1 showing Demographic profile of study population that revealed most of the hypertensive patient are in 60-69 age group i.e. 36.51% in which 35 patient are male and 34 female patient followed by 50-59 age group, 70-79, 40-49 with least number of patient in 30-39 age group only four patient. This result suggested that age group of 50-69 are most vulnerable group for the hypertension and associated disease.

Pharmacotherapy

Purpose of our study was analyzing the prescriptive patterns and physician's habit of prescribing mono, dual or multidrug therapy in hypertensive patient in indoor of tertiary care hospital. The results showed that, most of the patients 101(53.4%) underwent mono therapy

followed by 59(31.21%) underwent dual therapy and 29(15.34%) were prescribed more than 2 drugs.

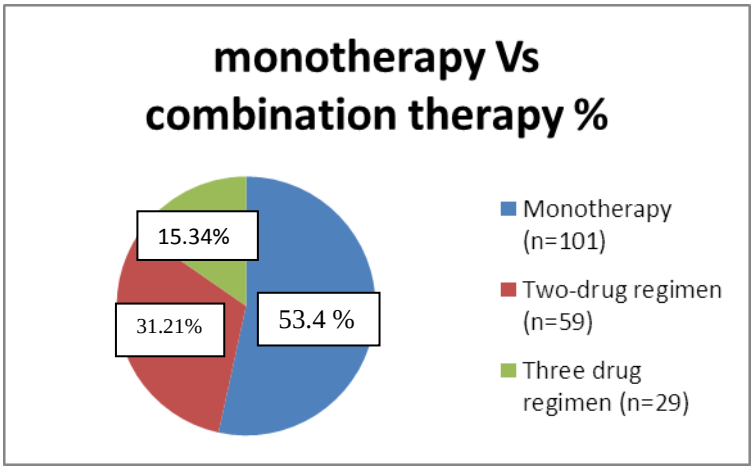

Figure: 2 Mono therapy Vs combination therapy.

Mono therapy

There are five group of antihypertensive drugs and the number of patients in whom they were prescribed under the class of mono-therapy are shown in the figure 2. The showed that, out of 189 patients who underwent antihypertensive therapy, 101(53.4%) were prescribed mono-therapy. Among these 101 patients, 79(41.80%) were found to be treated with diuretics, followed by 39(20.63%) were treated with CCBs, 35(18.52%) of patients with ACE inhibitors, 19(10.05%) of patients ARBs and 17(9.04%) of the patients with Beta Blockers. The study showed diuretics are most preferred drug for mono-therapy followed by CCB.

Table 2 shows the number of patients who underwent treatment under different groups of mono-therapy.

Table 2: Percentage of different group of mono therapy.

Drugs	Number of patient	% of prescription
Diuretics	**79**	**41.80%**
ACEI	**35**	**18.52%**
ARBs	**19**	**10.05%**
CCB	**39**	**20.63%**
Beta Blockers	**17**	**9.04%**

Dual therapy

Table 3 showed the frequency of prescription of dual combination therapy.

Results our study showed that among 189 patients 59(31.21%) patient treated by dual therapy with most commonly prescribed dual therapy was diuretics + CCBs (12.16%) followed by ACEI + Beta blocker (7.40%), Diuretics + ACEI (5.30%), ARBs + Diuretics (3.70%), Diuretics + Beta blocker (2.65%). In an Earlier studies showed that diuretics and ACEIs are the most commonly used drugs our study support that study findings.[12]

Table 3: Percentage of dual therapy.

Drug combination	Number of patient	% of
Diuretics + CCBs	23	12.16%
ACEI + Beta blocker	14	7.40%
Diuretics + ACEI	10	5.30%
ARBs + Diuretics	7	3.70%
Diuretics + Beta blocker	5	2.65%

Multiple therapy

In our study only 29(15.34%) prescribed multiple therapy with various combination in patient having multiple co-morbidities. Following multiple drug combination are used diuretics+ CCBs+ beta blockers, diuretics+ CCBs+ alpha agonist, diuretics+ CCBs+ ACEI and beta blockers + diuretics + alpha agonist with most common combination is diuretics+ CCBs+ alpha agonist data shows in table 4.

Table 4: Percentage of triple drug combination.

Drug combination	Number of patient	% of patient
diuretics+ CCBs+ alpha agonist	12	6.34%
diuretics+ CCBs+ beta blockers	6	3.17%
diuretics+ CCBs+ACEI,	6	3.17%
beta blockers + diuretics + alpha agonist	5	2.65%

Adverse effects

Among 189 patients recruited for the present study 79 patients (41.80%) reported to have adverse effects. 45.05% patient reported to have dizziness, followed by nausea (32.76%), oedema (14.1%) and dry cough (8.05%).

DISCUSSION

A prescription-based study is considered to be one of the very effective methods to evaluation and assessment of the prescribing habit of physicians.[13] Our study was based on the data of admitted patient in indoor of the medicine department that observed single drug therapy (53%) was more common than two or multiple drug therapy. These results did not supported the work of Anand et al and Hansson et al that showed blood pressure could be adequately

controlled with the help of combination therapy.[14] Furthermore combination therapy could be a rational approach to reduce the cardiovascular mortality but according to our study these goal can be achieved by mono-therapy especially in hypertension associated with other diseases.[15]

In the present study diuretics (49%) were the most commonly prescribed drugs for hypertensive patients followed by calcium channel blockers (43.5%). In an Earlier studies showed that diuretics and ACEIs are the most commonly used drugs our study support that study findings.[12] but according to a study done by Jhaj R et al., beta blockers were found to be the most frequently used group of drugs, followed by calcium channel blockers, ACE inhibitors and diuretics in that order.[16] A combination of calcium channel blockers and diuretics followed by combination of ACEI with beta blockers, Diuretics + ACEI, ARBs + Diuretics, Diuretics + Beta blocker were the leading drug combination to be more commonly prescribed indicating that diuretics were used as single as well as a component of multidrug therapy. Diuretics are commonly prescribed as first-line therapy for treatment of hypertension (JNC VII)[17] these finding supported by our study.

The Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC VI and JNC VII) reports note that volume overload due to irrational and inadequate use of diuretic therapy as alone is one of the most common cause for the development of resistance to hypertensive treatments.[17]

In the our study, single drug were mostly prescribed (53.4%), followed by two-drug combinations (31.21%) and three drug combinations (15’34). These results is supported by study done by preethi et. al These combination have favourable complementary synergistic effects, ß blockers blunt the reflex tachycardia caused by induced by the calcium channel blockers (CCB) and The latter drug counteract any peripheral vasoconstriction caused by unopposed alpha action. Their combined efficacy has been proved in various study.[17,18]

CONCLUSION

Our study showed the current prescribing pattern for antihypertensive agents in admitted patient of hypertension associated with other systemic diseases. It implies that diuretics are the most commonly prescribed antihypertensive agents followed by ACEI, ARBs, CCBs and beta blockers. Our study provides baseline data. The treatment of hypertension in indoor patient keeps changing and newer drugs are being added. Further studies design for the

rationale for choice of drugs based on associated co-morbid conditions demographic data, economical status and complications would give additional insights into prescribing patterns in hypertension in India.

REFERENCES

1. Du X, Cruickshank K, McNamee R, Saraee M, Sourbutts J, Summers A, Roberts N, Walton E, Holmes S. Case control study of stroke and the quality of hypertension control in northwest England. BMJ, 1997; 314: 272–276.
2. Krumholz HM, Parent EM, Tu N, Vaccarino V, Wang Y, Radford MJ, Hennen J. Readmission after hospitalization for congestive heart failure among medicare beneficiaries. Arch. Intern. Med., 1997; 157: 99–104.
3. Neaton JD, Grimm RH Jr, Prineas RJ, Stamler J, Grandits GA, Elmer PJ, Cutler JA, Flack JM, Schoenberger JA, McDonald R, et al. Treatment of mild hypertension study. Final results. Treatment of Mild Hypertension Study Research Group. JAMA, 1993; 270: 713–724.
4. The fifth report of the Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure. Arch. Intern. Med., 1993; 153: 154–183.
5. Journal of Health and Welfare Statistics. Health and Welfare Statistics Association, Tokyo, 1998; 45: 81–88.
6. Williams GH; Hypertensive Vascular Disease In: Harrison's Principles of Internal Medcine. Braunwald E, Fauci AS, Kasper DL, Hauser SL, Longo DL, Jamson JL (Eds). 19th edition, McGraw-Hill, 2015; 1616.
7. Haslett C, Chilvers ER, Hunter JAA, Boon NA editors; Hypertension. Davidson's Principles and Practice of Medicine. 18th edition, Churchill Livingstone, 2000; 216-222.
8. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK. Global burden of hypertension: Analysis of world wide data. Lancet, 2005; 0140-6736365: 217-23.
9. Tripathi KD editor; Antihypertensive Drugs. Chapter 40, Essentials of Medical Pharmacology, 6th edition, Jaypee Brothers Medical Publishers (P) Ltd., 2008; 539-554.
10. Lunde PK, Baksaas I. Epidemiology of drug utilization basic concepts and methodology. Acta Med Scand Suppl, 1988; 721: 7-11.
11. Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure. The Sixth Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC 66). Arch Intern Med., 1997; 157: 2413-46.

12. Ischer Michael A. Economic implications of evidence based prescribing or hypertension. JAMA, 2004; 21: 291.
13. Yuen YH, Chang S, Chong CK, Lee SC, Critchlev JA, Chan JC; Drug utilization in a hospital general medical outpatient clinic with particular reference to antihypertensive and antidiabetic drugs. J Clin Pharm Ther., 1998; 23: 287-294.
14. Hansson L; The benefits of lowering elevated blood pressure: a critical review of studies of cardiovascular morbidity and mortality in hypertension. J Hypertens., 1996; 14: 537-544.
15. Mancia G, Grassi G; Antihypertensive treatment: past, present and future. J Hypertens., 1998; 16: S1-S7.
16. Jhaj R, Goel NK, Gautam CS, Hota D, Sangeeta B, Sood A, Sachdev A; Prescribing patterns and cost of antihypertensive drugs in an internal medicine clinic. Indian Heart J., 2001; 53: 323-327.
17. Pai G Preethi, shenoy Jnaneshwara, Sanji Narendranath. Prescribing Patterns of antihypertensive drugs in a South Indian tertiary care hospital. Drug Invention Today, 2011; 3(4): 38-40.
18. Chalmers J; The place of combination therapy in the treatment of hypertension in 1993. Clin Exp Hypertens., 1993; 15: 1299-1313.