

Evaluation of Prescribing Pattern Of Antihypertensives Against The Clinical Condition

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Abstract:

Background : The prescribing pattern of antihypertensives by different physicians is not in compliance with that of the standard guidelines given by WHO/JNC-7. The patient factors associated with hypertension like age, sex, the presence or absence of co-morbid diseases along with hypertension will also play a major role in prescribing a particular class of antihypertensive drug. If the standard guidelines and the patient factors are not taken into consideration while prescribing the drugs then the final BP control remains unsatisfactory.

Objective: The purpose of this study was to evaluate the prescribing pattern, to determine the factors associated with the treatment of the disease.

Methods: It is an observational, prospective, non-interventional study in which prescriptions were collected during July-2013 to January – 2014 (for a duration of 7 months) in a tertiary care hospital to comprise a study population of 400 hypertensive patients.

Results: As monotherapy ACE-Inhibitors (38.25%) were the most commonly prescribed antihypertensives followed by calcium channel blockers (19.25%), Diuretics (13.25%) ranked third in the prescribing pattern. Combination treatment usually consisted of 2 antihypertensive drugs as a coformulation. The most common combination was a ACE-Inh+CCB (5%), followed by Beta-blocker+CCB (3.5%), patients gender, age and comorbidities significantly influenced which treatment was prescribed.

Limitations: The main limitation of this study was that all the prescriptions were collected from inpatient from a single hospital and it may not be a representative of prescribing pattern across the city.

Conclusion: In this study it was observed that the ACE-Inhibitors are the most commonly prescribed monotherapy agents (38.25%) and their prescribing pattern was in consistent with the global trends. Thiazides and the combination drugs were underutilized in this study, despite robust evidence to support their use.

I. Introduction:

Hypertension is blood pressure elevated enough to perfuse tissues and organs. Elevated systemic blood pressure is usually defined as a systolic reading >140mm Hg and a diastolic reading >90mm Hg (>140/90). The "seventh report of the joint national committee on Detection, Evaluation and treatment of hypertension (JNC-7) added a prehypertensive category, which includes individuals with systolic blood pressure readings of 120-139 or diastolic blood pressure readings of 80-90mm Hg; this category is now included in contemporary management strategies.

The JNC7 classification of BP in adults (age \geq 18 years) is based on the average of two or more properly measured BP readings from two or more clinical encounters.

Classification of Blood Pressure in Adults (Age \geq 18 Years)

Classification	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
Normal Less than	Less than 120	Less than 80
Prehypertension	120-139	80-89
Stage 1 hypertension	140-159	90-99
Stage 2 hypertension	Greater than or equal to 160	Greater than or equal to 100

Hypertension can be divided into two basic etiologic categories: unknown etiology (primary or essential hypertension) or a specific known etiology (secondary hypertension).

Drug induced hypertension :

Hypertension occurs in upto 5% of patients who take oral contraceptives.the proposed mechanism for contraceptive induced hypertension include stimulation of the rennin-angiotensin-aldosterone system,sodium and fluid retention.other drugs that also significantly increase BP are

Prescription medications

Corticosteroids, Estrogens , NSAIDS, Cyclosporine, tacrolimus, Ketamine, Desflurane, Carbamazepine Treatment primarily aims to lower BP toward normal with minimal side effects and to prevent or reverse organ damage. Currently there is no cure for primary hypertension. treating systolic and diastolic BP to targets that are<140/90 mmHg is associated with a decrease in cardiovascular complications, for patients with hypertension who have diabetes or renal disease, the BP goal recommended by the JNC-7 is 130/80 mmHg. The treatment of hypertension requires a multimodal approach that encompasses the use of non-pharmacological and pharmacological methods.

1.7a Non-pharmacological methods

II. Lifestyle Modification

Modification	Recommendation	Approx in
Weight reduction per 10kg wt loss.	Maintain normal body wt	5-20 mm Hg
Adopt DASH mmHg.	Consume a diet rich in fruits	8-11
Dietary sodium reduction 8 mm Hg.	And low fat dairy products. Reduce sodium intake to no more than 100 mEq/L.	2-
Physical activity	Regular aerobic physical Activity.	4-9 mmHg.
Moderation of alcohol	Limit consumption to no more than 2 drinks per day	2-4 mm Hg

A survey in Italian general practice hypertension control in primary care hospital was conducted by A Filippi et al came out with an outcome that high risk cardiovascular patients/uncontrolled grade2-3 hypertensive patients would probably require two additional drugs¹.The benefit of combinationtherapy over monotherapy as well as possible better efficacy of calcium channel blocker over diuretic inthe study population was demonstratedby Etuk et al²,more over in another study it was revealed that unsatisfactory nature of the layout & information contained in the prescription is largely the result of the lack of standardization of prescription formats in the country³,where as in a meta analysis the compliance with treatmentguidelines for hypertension was studied & the results of this study enlightened the poor compliance withtreatment guidelines by the physicians⁴,in the treatment of diabetic hypertensive patients ACE-inh are more often prescribed drugs as per the guidelines⁵,a disproportionately large percentage of antihypertensive drug cost was due to overt use of ACE inhibitors and indapamide instead of thiazide diuretics⁶,the compliance to the prescribing pattern by both family physicians and general practioners was suboptimal,educationalprogrammes should specifically address these inadequencies in order to improve the quality of health care⁷,a review on evaluating the first line therapy with diuretics,betablockers,ACE-inhibitors,CCB,alphablockers,centrally acting agents or angiotensin receptor antagonist was done and the Canadian recommendations for the management of hypertension was given⁸, Ramli et al conducted a similar trial in patients withhypertension, this study focusedthat Poor adherence to antihypertensive medication has beenrecognized as a major Reason for poor control of hypertension & it was revealed that simplifying the number of daily doses is Effective in improving adherence⁹,in constrast to the above trials the need of pharmacist interventions to improve the controlof blood Pressure in patients with hypertension has been illustrated by glynn& his group¹⁰,life style modification adds an additional benefit in reducing the BP along with the antihypertensive drugs by the Canadian recommendations¹¹, a study which was conducted in germany by jeschke& co has shown that the deviation from the guidelines were observed in one of every seven patients receiving some form of Complementary and Alternative Medicine(CAM) treatment¹², a similar study which was conducted in united states came out with the conclusion that there is a continuous decline in the use of less expensive agents such as diuretics and beta blockers¹³, in another study the Factors that are associated with antihypertensive drug compliance among Chinese patients were evaluated and it was concluded that Physicians should practice caution when prescribing antihypertensive drugsto patients with these factors where closer monitoring of their compliance patterns is warranted¹⁴, more over a study which was conducted by T.Pillay in south africa has showed a substantial non-adherence to standard treatment guidelines¹⁵,

In the largest trial to date (ALLHAT), thiazide-type diuretic was found to offer advantages over newer drugs. The medical community should now be capable of reaching consensus, and recommend thiazides as the first line therapy for the treatment of hypertension. Prescribing physicians, cardiologists, drug companies and health authorities are all partly responsible for the years of irrational prescribing that we have witnessed¹⁶, in an observational study it was concluded that the present study represents the current prescribing trend for anti-hypertensive agents and it highlights certain shortcomings in the existing prescribing practice¹⁷, young CH & Co has found the patterns of angiotensin II-receptor blocker (ARB) therapy in patients with and without a history of antihypertensive use. They concluded that the patients who started antihypertensive therapy with ARBs tended to be new to antihypertensive therapy and, in a plurality of cases, continued to receive therapy with ARBs only. More than a fifth of patients who received antihypertensive therapy in the recent past were switched from that therapy to treatment with ARBs only¹⁸, in another observational study the prescribing patterns of antihypertensive therapies (AHT) before and after the publication of the LIFE, ALLHAT and VALUE trials between 2000 and 2005 was assessed, and concluded that their findings shown that there was little or no effect on any of the three clinical trials studied on new AHT prescribing patterns in Irish general practice¹⁹, Morris et al has determined the factors associated with blood pressure control and concluded that the age, sex, race and depression are associated with antihypertensive drug adherence and blood pressure control²⁰.

III. Materials And Methods:

A total of 400 patient's prescriptions was taken for the study at Owaisi Hospital and Research Centre, Kanchanbagh, Hyderabad for 7 months and an observational, non-interventional, prospective study was carried out.

5) Inclusion and Exclusion Criteria:

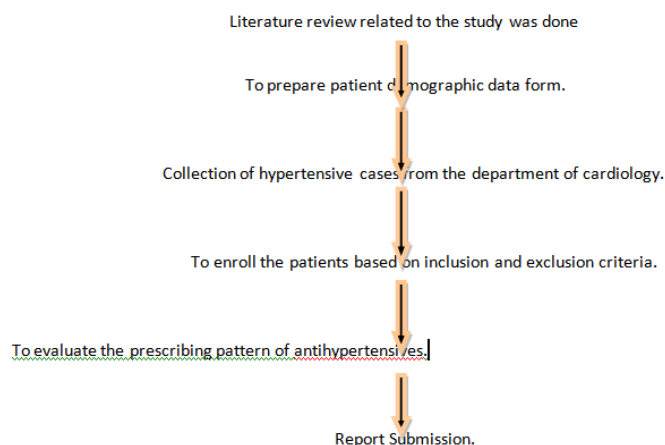
Inclusion Criteria:

- Patients with the age group >18 yrs.
- Hypertension with & without cardiovascular disease
- Hypertension with & without Diabetes Mellitus
- Patients receiving antihypertensive drugs with combinations.
- Alcoholic and non-alcoholic
- Smokers & non-smokers.

Exclusion Criteria:

- Pregnant Women.
- Patients with hepatic disease
- Age <18 yrs.

PLAN OF WORK



IV. Results

FIGURE 1. PERCENTAGE DISTRIBUTION OF FEMALES

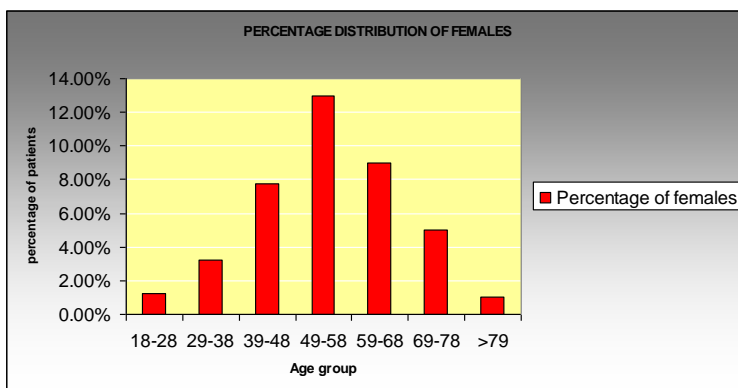


FIGURE 2. PERCENTAGE DISTRIBUTION OF PATIENTS BASED ON THEIR SOCIAL HABITS

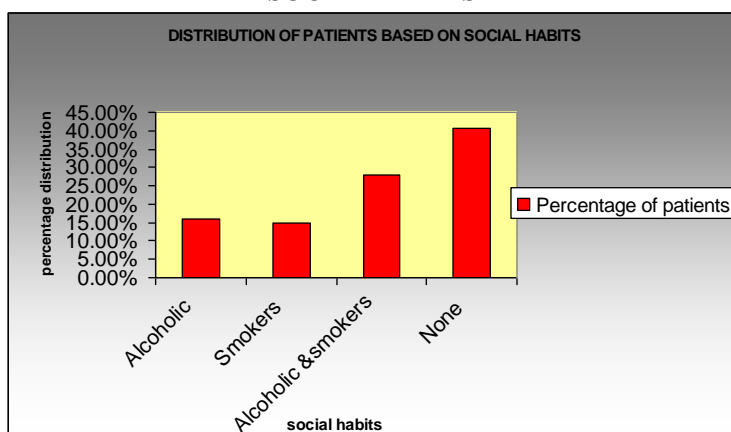


FIGURE 3. PERCENTAGE DISTRIBUTION OF PATIENTS BASED ON REASON FOR ADMISSION

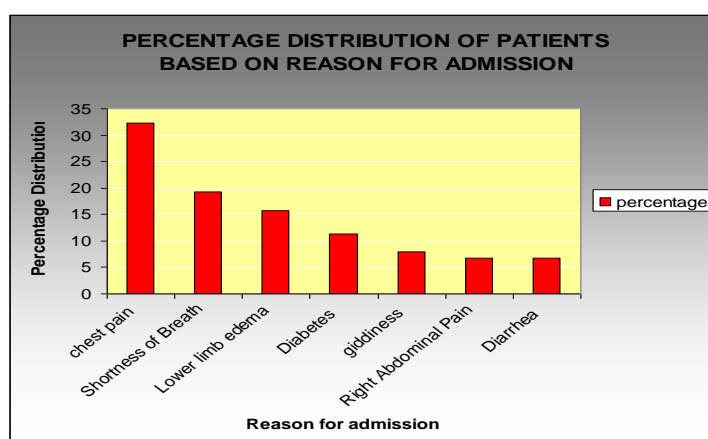


FIGURE 4. PERCENTAGE DISTRIBUTION OF PATIENTS BASED ON CONCOMITANT DISEASE

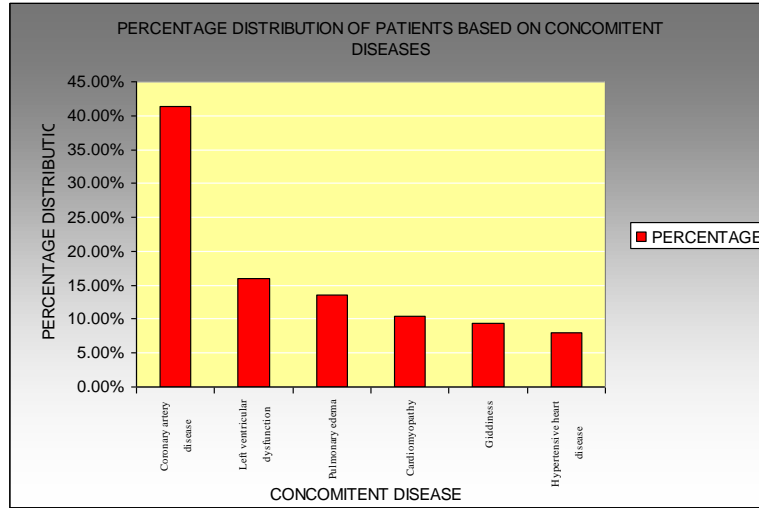


FIGURE 5. PERCENTAGE DISTRIBUTION OF PATIENTS BASED ON UNRELATED CONCOMITANT DISEASE

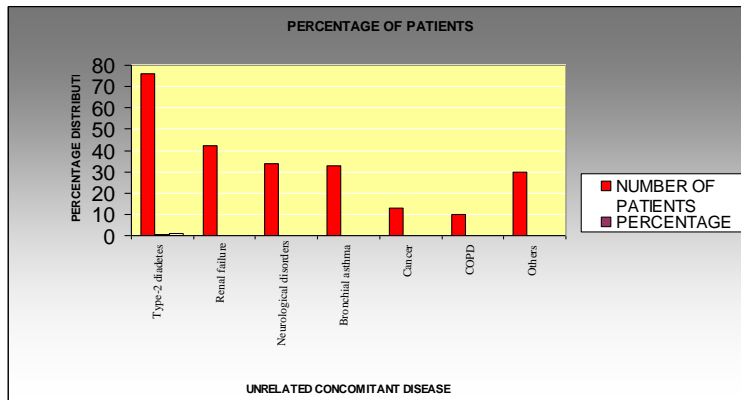


FIGURE 6. PERCENTAGE DISTRIBUTION OF MONOTHERAPY AGENTS USED FOR TREATMENT

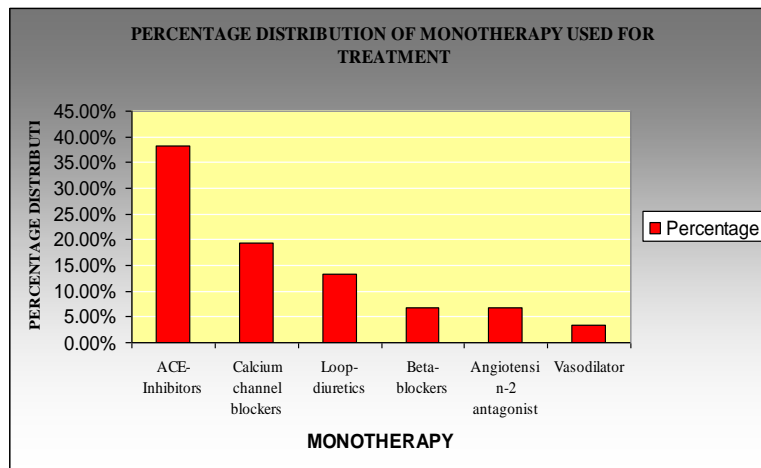
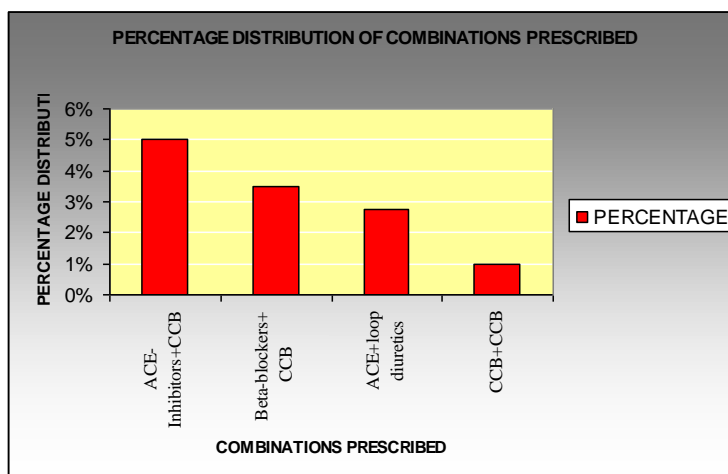


FIGURE 7. PERCENTAGE DISTRIBUTION OF COMBINATION DRUGS USED FOR TREATMENT



V. Discussion

PRINCIPAL FINDINGS

A total of 400 prescriptions were collected in which all the basic demographic data of the patient like blood pressure, sugar level (if the patient is diabetic), past medication history, social and family history was gathered. The following results were obtained in the study, out of 400 hypertensive patients' prescriptions the percentage of males with hypertension was 59.75% (239 patients) where as the percentage of females was 40.25% (161 patients).

In age & sex survival analysis, the highest percentage rate of hypertensive patients were found between the age range of 49-58yrs (19.25% of males & 13% of females) which is followed by the age group of patients between 59-68 (10.25% of males & 9% of females), the least percentage rate of the patients were found between the age group of 18-28 (3% of males & 1.25% of females) followed by the age group of patients >79yrs.

As per the social habits of the patients were concerned, out of 239 males there were 38 alcoholic patients, 36 with smoking habit, 67 with both the habits of smoking & alcohol consumption.

The distribution of patients according to the reason of admission, concomitant disease related to hypertension is given in the table.

S.No.	Reason for admission	Concomitant disease	Percentage of Hypertensive patients
1.	Chest pain	Coronary artery disease	32.25%
2.	Shortness of breath	Left ventricular dysfunction	19.25%
3.	Lower limb edema	Congestive heart failure	15.75%
4.	Diabetes	Endocrinal disease	11.25%
5.	Right abdominal pain	Gastro intestinal disorder	8.00%
6.	Diarrhea	Gastro intestinal disorder	6.75%
7.	Others	Oncology, neurology	6.75%

From the above table it was clear that the maximum number of hypertensive patients were with cardiovascular disease associated with severe chest pain the figure was 129 (32.25%) out of 400 patients, it was followed by 19.25%, 15.75%, 11.25% with shortness of breath, lower limb edema, diabetes respectively. The table also reveals that the least number of patients admitted to the hospital were with gastrointestinal disorder, asthma, cancer, urological, orthopedic problems.

Among the 400 patients 351 patients received monotherapy and only 49 patients received a combination therapy. In patients receiving monotherapy the rate of prescription of antihypertensives was followed in the order of frequency by ACE-I (38.25%), calcium channel blockers (19.25%), Diuretics (13.25%) followed by beta-blockers, angiotensin-2 receptor antagonist with prescription rate of 6.75% of each.

ACE-Inhibitors constitute the most frequently prescribed antihypertensive drug class. Among all ACE-inhibitors ramipril was the most commonly prescribed especially in the department of cardiology, its prescription pattern was similar to worldwide trend. In the Heart Outcomes Prevention Evaluation (HOPE)

Study of 9297 patients, ramipril reduced, by 20-30%, the rates of death, myocardial infarction, and stroke in a broad range of high-risk patients who were not known to have a low ejection fraction or heart failure. Moreover ACE-inhibitors are the most commonly prescribed antihypertensives for diabetic patients which was also in accordance with the evidence and the guidelines as these drugs will reduce the chance of occurrence of diabetic nephropathy, retinopathy and other related complications.

When calcium channel blockers were concerned their percentage of prescription was 19.25%, among the calcium channel blockers the most commonly prescribed drugs were the dihydropyridine type of calcium channel blockers (ie., amlodipine, felodipine) where as the prescription of non-dihydropyridine type of calcium channel blockers was very less.

In the case of diuretics the overall preference for prescribing the thiazides was negligible on the other hand there were 13.25% of prescriptions with loop-diuretics.

The percentage of prescription of angiotensin-2-receptor antagonist was 6.75% of which 90% of prescriptions were with the brand name telma (telmisartan) which clearly indicates that telmisartan was the most commonly prescribed angiotensin-2 receptor antagonist by the physicians in the hospital.

The overall preference for prescribing beta-blockers was only 6.75% among all the prescriptions. As per the combination therapy was concerned only 12.25% of the patients received a combination drug therapy for the treatment of hypertension, all the patients who were on a combination therapy received only a 2-drug combination. The following are the 2-drug combinations that were prescribed.

1. ACE-Inh+CCB
2. Beta-blocker+CCB
3. CCB+CCB
4. ACE-Inh+loop diuretics.

A 2-drug combination of CCB+ACE-Inh were prescribed to a majority of patients 20(5%), followed by a combination of Beta-blockers+CCB 14(3.5%), ACE+Loop-diuretics 11(1%), CCB+CCB 4(1%).

VI. Limitations:

The main limitation of this study was that all the prescriptions were collected from inpatient from a single hospital and it may not be a representative of prescribing pattern across the city.

VII. Conclusion:

In this study it was observed that the physicians had preferred monotherapy more oftenly than the combinations and the most frequently prescribed agent among monotherapy was ACE-Inhibitor class of antihypertensive. ACE-Inhibitors are the only class of drugs that are often prescribed to diabetic hypertensive patients, as these drugs prevent the chance of occurrence of diabetic nephropathy, retinopathy and other related complications. Thiazide diuretics and the combination drugs were underutilized in this study, despite robust evidence to support their use. As the use of the thiazide diuretics as monotherapy was negligible it increases the burden on the patients. As per the combinations were concerned only two drug combinations were prescribed there were no three or four drug combination prescriptions observed.

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