



## INTERNATIONAL JOURNAL OF ADVANCES IN PHARMACY MEDICINE AND BIOALLIED SCIENCES

An International, Multi-Disciplinary, Peer-Reviewed, Open Access, Indexed Journal

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### Evaluation of prescribing pattern of hypertensive patients admitted in general medicine ward of KEM hospital Mumbai

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#### ORIGINAL RESEARCH ARTICLE

#### ABSTRACT

##### ARTICLE INFORMATION

##### Article history

Received: 02 March 2016

Revised: 20 March 2016

Accepted: 28 March 2016

Early view: 30 March 2016

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**Background:** Hypertension is a major cause of premature deaths. The prescription containing antihypertensive drug is increasing day by day associated with other diseases such as diabetes, hyper-cholesterolemia, and cardiovascular disease.

**Materials & Methods:** A prospective observational study carried out in 200 patients diagnosed with hypertension. Prescribing patterns of all drugs Co-morbid conditions & percentage of monotherapy and combination drug therapy was noted for anti-hypertensive drugs. Adverse Drug Reactions (ADR) from anti-hypertensive drugs were noted.

**Results:** Out of 200 patients 132(66%) were male and 68(34%) were female. The mean age of patients was 55.28(+ 12.7) years. The total numbers of drugs prescribed were 1211 to 200 patients. The average number of drugs per prescription was found to be 6.05. A total of 409 anti-hypertensive drugs were prescribed to 200 patients. The most frequently prescribed anti-hypertensive agents were Calcium Channel Blockers (CCB's) 34.7%; followed by Beta blockers 28.36%, Diuretics 19.07%, Angiotensin Converting Enzyme Inhibitors(ACE-I) 5.5%, Angiotensin Receptor Blockers (ARB's) 4.4%,and Alpha Blockers 0.9 %.

**Conclusion:** Prescription audit is an important mechanism to improve the quality of care offered by hospitals. The information on drug prescribing patterns can provide a framework for continuous prescription audit in a hospital setting. This can help the prescribers to improve patient management by rationalising prescribing practices.

**Keywords:** Hypertension, Evaluation, Prescription audit.

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#### INTRODUCTION

Hypertension is common worldwide disease affecting humans. Because of the associated morbidity and mortality and the cost to society, Hypertension is important public health challenge. Hypertension is having complex etiology, affecting 972 million people worldwide (Kearney et al., 2005).

Important risk factor for cardiovascular disease is Hypertension (Lawes et al., 2006). It is the major risk factor for cardiovascular mortality rate, which accounts for 20-50% of all deaths (Park, 2005).

In India Cardiovascular diseases (CVD) caused 2.3 million deaths in the year 1990. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India. Increase in hypertension in India is due to Lifestyle Changes. Pooling of epidemiological studies shows that hypertension is present in 25% urban and 10%

rural population in India. At an underestimate, there are 31.5 million hypertensive in rural and 34 million in urban populations (Gupta, 2004).

According to a recent review on "the global burdens of hypertension", the estimated prevalence of hypertension (in people aged 20 years and above) in India in 2000 was 20.6% among males and 20.9% among females and is projected to increase to 22.9% and 23.6% respectively in 2025. The estimated total number of people with 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 (Kearney, 2006).

As hypertension begins insidiously, yet can be treated effectively, upper limit of normal B.P. needs to be determined. A much smaller number of patients will have less than 5% of adrenal or renal cause for their

high blood pressure. Remaining were diagnosed as primary or essential hypertension. Apart from genetic component more women than men and more urbanites than country dwellers are affected by primary hypertension. In addition, chronic psychological stress whether be it job related ( Pilot, Bus driver) or be it a personality related like frustrated fighter can induce hypertension (Stefan, 2000).

Hypertension is also called as silent killer. The strong reason behind this name given to hypertension as silent killer is that the patient externally looks like fit and fine and in most cases physician could not find any signs and patient also don't have any symptoms until disease gets established. Hypertension internally affects various target organs. If it affects brain then it is called neuropathy. Whenever hypertension affects kidneys it is called nephropathy. When hypertension affects eyes it is called retinopathy (Brawnwald's Heart disease, 2007).

Hypertensive patients should be assessed initially for the following things. A thorough complete history, Complete Physical examination should be done to confirm the diagnosis. Patient should be screened for other cardio vascular disease risk factors for secondary causes of hypertension. One should assess the blood pressure related life style and determine the potential for intervention. Most patients who have hypertension had not complaints of any symptoms referable to high blood pressure. Popular complaint of patients with high blood pressure with severity is headache especially in the morning specifically occipital headache. It is also named as hypertensive headache. The Non Specific Symptoms which are related to hypertension are Palpitations, dizziness, easy fatigability and impotence. When symptoms are present they are generally related to hypertensive cardiovascular diseases or to manifestations of secondary hypertension (Brawnwald et al., 2001).

The vast majority of research on the detection and treatment of hypertension has appropriately focused on the outpatient setting, but available evidence suggests that elevated BP observed in hospitalized patients likely represents hypertension (Shapana Sultana, 2010).

In 2002, there were more than 38 million inpatient hospitalizations and roughly 33 million additional surgical procedures among adults (Joseph & Babalola, 2010).

Given the shortcomings of outpatient based screening and treatment, better recognition of hypertension the inpatient setting represents an opportunity to improve hypertension treatment and control. According to WHO the terms "quality of life" and more specifically "health related quality of life" (HRQOL) refer to the physical, psychological, and social domains of health, seen as distinct areas that

are influenced by a person's experiences, beliefs, expectations, & perceptions (Wolf-Maier, 2004).

Individuals' perceptions of their quality of life may be affected not only by their illness but also by their therapy. This is the case with individuals who have hypertension (Tiesta, 1996). Nevertheless, antihypertensive drug therapies are frequently associated with unpleasant side effects that may have an impact on many aspects pertaining to quality of life (Lawrence, 1996; Fletcher, 1989). Quality of life means subjective evaluation, which is embedded in a cultural, social and environmental context. Many components of quality of life cannot usually evaluated according to classical principles of item-measurement theory (Tom, 2013). In clinical practice the WHO-QOL assessments will assist clinicians in making judgments about the areas in which a patient is most affected by disease, and in making treatment decisions ( Vikti, 2007).

Prevention of Hypertension & for the treatment of hypertension one should imply various life style modifications. It has been observed that these strategies would have very good implication on control of hypertension in large population. Those patients who have Prehypertension, Health promoting modifications are for those people found to be very useful for prevention of hypertension. Reduce the alcohol intake, correct obesity; salt intake restriction should be done. Physical exercise should be done. Fruits & vegetable intake should be increased. All these strategies would help in lowering and controlling of high blood pressure .Moreover, Cessation of Smoking, eating fish oil & adapting low saturated fat diet may further help in reducing cardiovascular risks (Haslett et al., 2002).

High blood pressure should be controlled to a very stringent manner. For controlling blood pressure, Physicians used various Antihypertensive medicines. And they are described in different groups. Beta Adrenergic receptor blocker lowers the blood pressure by decreasing cardiac output due to a reduction of a heart rate and contractility. For example: Atenolol, Metoprolol, Propranolol. It is particularly affective in patients of hypertension with tachycardia and their hypotensive potency is enhanced by co administering the drug with a diuretics. Nebivolol is cardioselective beta blocker. One of the contraindication of Beta blocker is this beta blocker which is non selective we should not use in patients with older age patients and specially in Bronchial asthma patients. Because if we use this drug in Bronchial asthma patients, instead of causing good effect on the patient, this will increase the asthmatic attacks. And worsen the condition of patient.. In these times we can use cardio selective beta blockers. Angiotensin Converting Enzyme Inhibitors and Angiotensin Receptor Blockers should not be given at the same time. This combination is

contraindicated. Diuretics should be used cautiously (Brawnwald et al., 2001).

This study is very important for various purposes like with this critical evaluation of prescribing pattern, we can find out the exact nature of prescription which is given to the patients in Tertiary Care Hospital K.E.M Hospital Mumbai and if some discrepancy is there then we can make various regulations in tertiary care hospital so that no negligence would happen and correct medications would reach to the patients. The goal of the study is to describe the antihypertensive medication prescribing patterns for inpatients with hypertension at a Tertiary care hospital in Mumbai in order to better understand the patterns of care for inpatients and potential opportunities for improvement in hypertension management. Aim of study was Evaluation of Prescribing Pattern in Hypertensive Patient Admitted in General Medicine Ward. & the Primary objective was to study the Prescribing Pattern in hypertensive patient admitted in general medicine ward. The Secondary Objectives were (i) To Study the commonly used anti-hypertensive drugs in hypertensive patients. (ii) To find out percentage of monotherapy & combination therapy used in hypertensive patients admitted in general medicine ward. (iii) To find out Adverse Events (AEs) of anti-hypertensive drug in hypertensive patient. It is a Prospective-Observational study done in Department of medicine, Ward No -12, 4A. K.E.M. Hospital, Parel, Mumbai on 200 patients for 12 weeks.

#### MATERIAL METHODS

This was a prospective observational study which was carried out at Department of Medicine, Ward No 12 & 4A, K.E.M. hospital, Parel, Mumbai. Approval of the ethics committee was taken prior to the initiation of the study.

#### Inclusion Criteria

- Patients diagnosed with hypertension.
- Patients admitted in general medicine ward under NDK unit in KEM Hosp.
- Age: -  $\geq 18$  years.
- Patients of either sex.

#### Exclusion Criteria

- Patients not willing to give Informed Consent.

Hypertensive patients were identified from all patients admitted in male & female general medicine ward. They were screened & enrolled, after they fulfilled the inclusion & exclusion criteria. Patient with known case of Hypertension (HTN) admitted for other reason in ward were included in this study. The Patient Information Sheet (PIS) was provided to the selected patients in vernacular language. All doubts & queries were solved by the study investigator. When patient were voluntarily ready to participate in study, voluntary informed consent was taken. After filling

the Informed Consent Form (ICF), patients were interviewed for details of demography, past medical history, current medications & co-morbid conditions. Blood Pressure (BP) was recorded at time of interview. All the information of patient were recorded in Case Record Form (CRF) & BP was taken regularly till patient stayed in the ward & effect of antihypertensive drug recorded in the form of changes in the systolic & diastolic BP. Data collected was analyzed by Statistical Package for the Social Sciences (version 19) & result was drawn.

#### RESULTS

All patients diagnosed with hypertension admitted in one unit of Medicine general ward in a tertiary care hospital K.E.M. Hospital, Mumbai were evaluated. The total numbers of patients enrolled were 200. Out of 200 patients 132(66%) were male patients and 68(34%) were female. 21 Patients of 18-39 years of age were found followed by 97 patients of 40-59 years old. 82 patients were of the age above 60 years. Total numbers of drugs prescribed were 1211 for 200 patients. Average number of drugs prescribed per prescription was 6. In this Percentage of Hypertensive medications were 33.77%.

Table 1. Antihypertensive drugs prescribing.

Antihypertensive Drug classes	Number of prescriptions with the anti-hypertensive drug	% of anti hypertensive drugs
Calcium channel blockers	142	34.7
Beta blockers	116	28.36
Diuretics	78	19.07
Angiotensin Converting Enzyme inhibitors	50	5.5
Angiotensin Receptor Blockers	18	4.4
Alpha blockers	04	0.9
SNP	01	0.24
TOTAL	409	100

Apart from Anti-hypertensive agents the other most frequent drugs prescribed belongs to Anti-platelet drugs like Aspirin, Clopidogrel which were prescribed to 167 patients (83%), followed by Lipid lowering agents 120 (60%) like Statins and fenofibrate, Anti ulcer drugs 75(37%) like pantoprazole, ranitidine. Other drug classes prescribed to Hypertensive patients are mentioned.

#### Anti-Hypertensive Polytherapy

22% percent of the prescriptions contained a single antihypertensive drug, while 56% contained combination of two antihypertensive drugs, 21% contained combination of three and 1% contained combination of four drugs.

**Table 2.** Prescription pattern of major classes of drugs prescribed to Hypertensive patients.

Sr.No.	Drug Class	Number of drugs
1.	Anti-hypertensive agents	409
2.	Anti-platelet drugs	167
3.	Lipid lowering drugs	120
4.	Anti-diabetic agents	40
5.	Anti-ulcer agents	75
6.	Anti-anginal agents	50
7.	Anti-emetic agents	22
8.	Anti-microbial agents	56
9.	Steroids	35
10.	Anti-coagulants	37
11.	Analgesics	07
12.	Calcium supplements	29
13.	Multivitamins	56
14.	Mannitol	26
15.	Laxatives	14
16.	Bronchodilators	13
17.	Anti-convulsant agents	17
18.	Anti-malarial agents	03
19.	Cardioglycosides	02
20.	Others	35

### Co-morbidities associated with Hypertension

Chronic Kidney Disease (CKD) 25% was the most associated Co-morbidity in hypertensive patients followed by Ischemic Heart Disease (IHD) 23%, Diabetes Mellitus 16.5%, Cerebrovascular Accident (CVA) 11%, Left Ventricular Failure (LVF) 2.5

In our study we did not find any Adverse Events (AE's) related to the use of Anti-hypertensive drugs.

### DISCUSSION

There were few studies conducted all over the world about prescription pattern. The study was done by Tom Walley et al, between 1993 to 1997 & was followed for 4 years shows that diuretics & beta blocker monotherapy accounted for almost 55% of first -line treatment. This varied by age & gender. Older patients tended to be prescribed diuretics & younger patients with beta blockers or ACE inhibitors/AIIRAs. The result shows that the guidelines for treatment followed in some aspect but not all. Large numbers of patients are poorly controlled on one or two drugs only. Also there is no clear plan for changes in therapy (Tom et al., 2003).

In 1999, the study was done by Gambassi & Colleagues, In their thorough analysis of the treatment of hypertension in elderly nursing home residents concluded that the current prescription pattern with a predominance of calcium antagonists & angiotensin- converting enzyme. At the expose of beta blockers did not follow recommended guidelines (Gambassi et al, 1999).

In 2006, Randall S Stafford monitored national patterns of antihypertensive drug therapy in US between 1993-2004. Prescription of CCB & ACE

inhibitors declined significantly while prescription of ARB increased continuously & polytherapy prescriptions particularly those involving > or = 3 drug classes became increasing prevalently. The evidence based guidelines for antihypertensive drug shows that impact to be short lived but in future intervention are imperative for promoting long term adherence to published guidelines (Randall, 2006).

The demographic details revealed that there was a male preponderance with a mean age of 53.69. Total number of drugs prescribed were 1211 to 200 patients. The average number of drugs per prescription was 6.05, indicating polypharmacy. In research studies, polypharmacy has been defined as the concomitant use of five or more drugs (Viktil, 2007). Generally, a finding of polypharmacy is an indication that there is scope for review of the existing prescribing trends. However, given the distinctive health problems of this particular study population, it is a debatable point whether use of five concomitant drugs can be considered to be polypharmacy. Our study thus highlights the issue of definition of polypharmacy for Hypertension with multiple co-morbid factors. This is of vital importance given that polypharmacy requires justification because of the increased risk of drug interactions and errors of prescribing.

In 2010, the study was done by Vijaykumar et al. (2011) in Andhra Pradesh to find out the prescribing trends & rationality of drug prescribing pattern. Total 690 patients were collected over three months from Feb 2010 to May 2010 & average number of drug per prescription was found to be 3.01 (Vijaykumar, 2011).

In our study the total numbers of drugs prescribed were 1211 to 200 patients. The average number of drugs per prescription was found to be 6.05 mainly because we selected the patients of Hypertension with co-morbid conditions. All patients received antihypertensive drugs. A total of 409 anti-hypertensive drugs were prescribed to 200 patients.

Also a study conducted in Taiwan between January 1997 and December 2004 by Pang-Hsiang Liu et al. was done to determine the prescription patterns and time trends for antihypertensive medication in newly-diagnosed cases of uncomplicated hypertension with mono-therapies being found to be dominant in the first year, albeit declining over time. Calcium channel blockers (33.5%) and beta-blockers (27.3%). were the most frequently prescribed antihypertensive drugs, either alone or in combinations. Although least expensive, the prescription rates of diuretics were low, at 8.3% for mono-therapies and 19.9% overall. The prescription rate for angiotensin receptor blockers (ARBs) was elevated considerably over time (Pang, 2008).

Our study results are analogous with the above study as it revealed that calcium channel blocker (34.7%)

and Beta blockers (28.36%) were the most frequently prescribed anti-hypertensive drugs to treat hypertension. The least prescribed anti-hypertensive drugs were Alpha Blockers (0.9%). Physicians preferred a two drug combination of anti-hypertensive drugs given to 56% of patients followed by Single drug Anti-hypertensive drugs to 22% patients. Three drug combination of anti-hypertensive drug were prescribed to 21% of patients. In today's modern era and changing lifestyle physicians prefer a combination of two or more anti-hypertensive drugs to control Blood Pressure to a normal level.

Associated major co-morbid conditions of hypertension noticed in this study were Chronic Kidney Disease (CKD) 25% followed by Ischemic Heart Disease (IHD) 23%. 29.5% of patients had no co-morbid conditions.

### CONCLUSION

If hospitals have to improve quality of care then prescription audit is necessary mechanism to impose. Variety of classes of drugs was prescribed in patients with hypertension. This was indicative of wide spectrum of prevailing co-morbidity patterns in patients. Dropouts can be minimized with the help of prescription audit & compliance would be improved. Drug prescription audit can help the prescribers to improve patient management by rationalizing prescribing practices.

### LIMITATIONS OF THE STUDY

The data was collected only in a single unit of the Department of Medicine, and in 36 weeks clinical posting, topic selection, protocol writing & ethics committee approval took period of 12 week, data collection would be in 12 weeks & analysis of data took 12 weeks period. A larger study involving more units done and over a period of 6 months-1 year would make it possible to apply WHO-QOL Questionnaire to antihypertensive drugs to determine their effect on QOL which could not be done in our present study

### RECOMMENDATIONS

Prescription audit studies should be conducted on a multicentric basis so that we can approach patients with hypertension with more appropriate treatment strategies..

### CONFLICT OF INTEREST

None declared.

### ACKNOWLEDGEMENTS

I acknowledge to Dr. Abdul Hamid, Dr. Ismail, Zakiya Parveen, Dr. Javed Ansari Sir for their support.

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