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Prevalence of Drug Utilization Patterns on Hypertensive Patients in Tertiary Care Hospital

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Abstract
Introduction: *A Prospective Study on Prescribing Pattern and Utilization of Anti-Hypertensive Drugs in A Tertiary Care Teaching Hospital*
Method: *The Prospective observational study was conducted in Department of pharmacology, Kerala Medical College Hospital for a period of 6months. Total 500 prescriptions were analyzed in hypertensive patients of OPD medicine departments. Prescriptions were evaluated for prescribing pattern by using WHO drug use indicators.*
Results: *Out of 500 samples, 325 (65.00 %) were male and 175 (35.00 %) were female. The mean age of patients were 55.14 ±1.09, BMI was 27.21 ± 0.88kg/m^2. The average no. of drugs/prescription was 3.44±1.41. A total of 1951 drugs were prescribed in overall study period. 520 (26.65%) were antihypertensives, 343 (17.58%) antidiabetic drugs, 374 (19.16%) NSAIDs, 114 (5.84%) Thyroid hormones, 54 (2.76%) Statins, 54 (2.76%) anti-anxiety/ antidepressants and 492 (21.44%) were miscellaneous. A total of 520 antihypertensive drugs were prescribed; Angiotensin Receptor blockers (ARBs) were 119 (22.88%), ACE inhibitors were 112 (21.53%). Beta blockers were 97 (18.65%), Ca^+ channel blockers were 73 (14.03%) and other antihypertensive were 21(4.03%). Total 98 fixed dose combinations were used; Amlodipine and Atenolol 30 (30.61%) followed by Olmesartan and Hydrochlorthiazide 21 (21.42%), Losartan and Hydro-chlorthiazide 17 (17.34%), Ramipril+Hydrochlorthiazide 12 (12.24%), Telmisartan+ Hydrochlorthiazide 10 (10.20%) followed by Three drug combination of Olmesartan+Amlodipine +Hydrochlorthiazide 08 (8.1%).*
Conclusion: *Present study reveals that, male hypertensive patients are more than the female patients; most commonly prescribed drugs were antihypertensives, antidiabetic and NSAIDs. Antihypertensive drugs were ARBs, ACE inhibitors and combination therapy of Amlodipine with Atenolol.*
Keywords: *Hypertensive, Drug utilization, OPD, Tertiary care hospital.*

INTRODUCTION

The study of prescribing pattern is very important component of medical audit which include monitoring, analyzing and necessary modifications in the prescribing practices to achieve rational in medical care[1]. It is important to define prescribing pattern, identify the irrational prescribing habits and remedial measures to the prescribers. However, drug utilization studies evaluate and analyze the medical, social and economic outcomes of the drug. Studies should be more meaningful and observe the prescribing attitude of physicians with the aim to provide drugs rationally.[2,3] Hypertension is an important public health problem in both developed and developing countries. In India, cardiovascular diseases (CVDs) are estimated to be responsible for 1.5 million deaths annually.[4]. Large number of national and international guidelines have been published for the treatment of hypertension. JNC 7 guideline recommends diuretics as the first-line of treatment in hypertension.[5]. Monitoring of prescriptions and drug utilization studies could identify the associated problems and provide feedback to prescriber.[6]. Developing countries have limited funds available for healthcare and drugs. It becomes very important to prescribe drug rationally so that the available funds can be utilized optimally [7] Complications are the major predictor for the prognosis of the disorder. Morbidity and mortality tend to increase gradually with hypertension. By 2025, the epidemiological data estimates that there will be an increase of 29.2% hypertensive cases worldwide [8]. Several anti-hypertensive drugs were published in the health care system to promote the rational usage of the drugs globally. Drug utilization pattern provides us insight in the rationality of prescribing. Irrationality in the prescription is the primary reason for the complications of the disorder. To promote rationality- minimising the errors, complete history taking, assessing the comorbid conditions are the important tools [9]. Present study aims in developing the significance and rationality of drug utilization in preventing the complications and promoting the public health.

METHODOLOGY

The observational study was conducted in Department of Pharmacology, Kerala Medical College Hospital during the period of June 2015 to May 2016 after obtaining the institutional ethical committee approval. A total 500 samples were collected and analyzed in hypertensive patients at outpatient departments. Data of patients matching inclusion criteria were recorded. Before including in the study, patients were explained about the aspects of research work. Written informed consent was taken before including him or her into the study. Once the consultation by the physician was over, the prescriptions were copied and patients were interviewed regarding duration of taking antihypertensive drugs. Data like name, age, sex, and duration of hypertension, assessment of the prescription pattern, family history, coexisting diseases, socio-economic status, BMI was recorded from patient's prescription. All the data were compiled and subjected to descriptive statistical analysis by using in Graph pad prism.

Inclusion Criteria

1. Patients with hypertension, of both sex and all age groups, who were prescribed an antihypertensive drug in medicine OPD.
2. Patients referred from other department who reported Medicine OPD.

Exclusion Criteria

1. Patients who reported in OPD and were subsequently admitted.
2. Patients with hypertensive emergency
3. Patient with any concurrent acute medical condition. e.g., acute myocardial infarction, Acute left ventricular failure etc.

RESULTS

Table-1: Demographic profile of hypertensive patients

Parameters	Number	Percentage
Males	325	65.00
Females	175	35.00
Mean Age (years)	55.14 ±1.09	-
BMI (kg/m^2)	27.21 ±0.88	-
Middle socio-economic status (MSES)	285	57.00
Lower socio-economic status(LSES)	95	19.00

Upper socio-economic status(USES)	120	24.00
Family History of HTN	165	33.00
H/O addiction smoking/alcohol	121	24.2
Average number of drugs per prescription [Mean±SD]	3.44±1.41	-
Average number of antihypertensive drugs per prescription [Mean±SD]	1.71±0.62	-
Coexisting Conditions		
Type 2 Diabetes mellitus	114	22.8
Hypothyroidism/hyperthyroidism	45	9.00
Coronary Artery disease	12	2.4
Bronchial Asthma /COPD	25	4.8

The Present study, total 500 prescriptions were analyzed. Out of 500 samples 325 (65.00 %) were male and 175 (35.00 %) were female patients. The mean age of patients was 55.14 ±1.09 years. The average Body Mass Index (BMI) was 27.21 ± 0.88kg/m^2. The average number of drugs per prescription was 3.44±1.41, Average number of antihypertensive drugs per prescription was 1.71±0.62 , values were expressed in Mean ± SEM. Majority of patients belonged to middle socio economic status n=285 (57.00%), 95 (19.00%) patients were in lower socio economic group and the rest 120(24.00%) patients belonged to upper socioeconomic status. Family history of hypertension was present in 165(33.00%) patients. History of addiction to either smoking or alcohol was present in 121 (24.20%). Co-morbid conditions associated with Hypertension included Type 2 Diabetes mellitus in 114 (22.8%), hypothyroidism in 45(9%), Coronary artery disease in 12 (2.4%) and Bronchial Asthma/COPD in 25 (4.8 %) patients (Table-1).

Table-2: Total drugs prescribed over the study period

DRUGS	No.of drugs	Percentage
Antihypertensives	520	26.65
Antidiabetics	343	17.58
NSAIDs	374	19.16
Thyroid Hormones	114	5.84
Statins	54	2.76
Antianxiety/ antidepressants	54	2.76
Miscellaneous	492	25.21
Total	1951	100

Table-2. A total of 1951 drugs were prescribed in overall study period. 520 (26.65%) were antihypertensives, 343 (17.58%) antidiabetic drugs, 374 (19.16%) NSAIDs, 114 (5.84%) Thyroid hormones, 54 (2.76%) Statins, 54 (2.76%) anti-anxiety/ antidepressants and miscel-laneous category included 492 (21.44%) drugs. The miscellaneous category of drugs comprised of multivitamins and antioxidants, antacids, calcium tablets, antibiotics, anti-allergics etc.

Table-3: Different antihypertensive prescribed over the study period

Antihypertensives	Total No. of drugs	Percentage
Angiotensin Receptor Blockers	119	22.88
ACE inhibitors	112	21.53
Beta blockers	97	18.65
Ca^+channel blockers (CCBs)	73	14.03
Others	21	4.03
Fixed dose combinations	98	18.84
Total	520	100

Table-3. A total of 520 antihypertensive drugs were prescribed. Angiotensin Receptor blockers (ARBs) were 119 (22.88%), ACE inhibitors were 112 (21.53%). Beta blockers were 97 (18.65%), Ca^+ channel blockers were 73 (14.03%) and other antihypertensive were 21(4.03%). commonly prescribed drugs were Olmesartan, Losarta and Telmisartan. Amongst ACE inhibitors the most commonly prescribed drug was Ramipril followed by Enalapril. Atenolol was the most commonly prescribed Beta blocker followed by Metoprolol and Nebivolol. Amlodipine was the only Calcium channel blocker prescribed.

Table 4: Combination of different antihype-rtensive prescribed over the study period

Combination of antihypertensive drugs	Total No. of drugs	Percentage
Amlodipine + Atenolol	30	30.61
Olmesartan+ Hydrochlorthiazide	21	21.42
Losartan + Hydrochlorthiazide	17	17.34
Ramipril + Hydrochlorthiazide	12	12.24
Telmisartan + Hydrochlorthiazide	10	10.20
Olmesartan+Amlodipine+ Hydrochlorthiazide	08	8.1
Total	98	100

Table-4. Total 98 fixed dose combinations were used in the present study, out of 98 combinations,

most common was two drug combination of Amlodipine and Atenolol 30 (30.61%) followed by Olmesartan and Hydrochlorthiazide 21 (21.42%), Losartan and Hydrochlorthiazide 17 (17.34%), Ramipril+Hydrochlorthiazide 12 (12.24%), Telmisartan+ Hydrochlorthiazide 10 (10.20%) followed by Three drug combination of Olmesartan, Amlodipine and Hydrochlorthiazide 08 (8.1%). Overall, two drug therapy was more common than the three drug therapy.

DISCUSSION

A prescription based survey is considered to be one of the most effective methods to evaluate the prescribing attitude of the physicians as well as dispensing practice of pharmacists[10] .The present study observed that incidence of hypertension was higher in males that was comparable to the previous studies on hypertensive patients[11,12]. The average age of patients in the present study was 55.14 ±1.09 years; this was comparable to the age of patients in two studies where it was reported to be 52.3 years and 52.93 years. [13,14], Family History of hypertension 165(33.00%) which was comparable with earlier study [15] , In the present study most commonly prescribed antihypertensive agents were Angiotensin Receptor Blockers and Angiotensin Converting Enzyme Inhibitors, which was comparable with a previous study[16] . The coexisting diseases were diabetes, coronary artery disease and hypothyroidism. Co-prescribed drugs were antidiabetics, statins and thyroid hormones. The prescription of ARBs and ACE inhibitors seems justified as these drugs have a protective role in diabetic patients [16]. These drugs are known to decrease the onset and progress of microvascular complication of hypertension and diabetes mellitus as described in previous studies [17]. In the present study diuretics were not used in monotherapy. They were only a party of two/three drug regimen. Underutilisation of diuretics has been reported from time to time. The earlier study supported and described the decrease in prescribing trend of diuretics [18]. Earlier studies also suggested that an ideal combination therapy must include that possess synergistic anti-hypertensive effects without any adverse effects, at low doses [19]. Present study represents the current prescribing trend for antihypertensive agents. It implies that Angiotensin receptor blockers (ARBs) and ACE inhibitors were leading group of antihypertensive agents.

CONCLUSION

Present study reveals that, male hypertensive patients are more than the female patients; most commonly prescribed drugs were antihypertensives, antidiabetic and NSAIDs. Antihypertensive drugs were ARBs, ACE inhibitors and combination therapy of Amlodipine with Atenolol. This study can be extended further by increasing the sample size and time period of data collection.

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