Prescribing Pattern of Antihypertensive Drugs in Hypertensive Patients with Non-Insulin Dependent Diabetes Mellitus at Tertiary Care Hospitals in Karachi Pakistan

ABSTRACT

Introduction: Hypertension (HTN) is one of the most serious public health issues in the world, affecting around 1.4 billion people worldwide. HTN is becoming highly prevalent in Pakistan, about more than 33% of people over the age of 40 years suffering from the HTN. The illness burden is continuously growing due to the incorrect medicine prescriptions, a lack of education, and a lack of patient compliance. The existence of comorbidities such as diabetes mellitus should be properly considered while choosing an antihypertensive medication. Similarly, the prescriptions of oral hypoglycemic agent's appropriate consideration are essential. Oral hypoglycemic medications are divided into several categories. Physicians face a challenge in rationally selecting a regimen from a variety of classes, and the situation becomes more complicated when the patients have additional non-communicable illnesses, such as HTN. The combination therapy of ailments not only aeffects the patient`s economic status but also aeffects the quality of life. **Objective:** To study the prescribing pattern of antihypertensive drugs in hypertensive and non-insulin dependent diabetes mellitus patients at Tertiary care hospitals in Karachi, Pakistan. **Methods:** A cross sectional study was undertaken for six months in medicine outpatient department at tertiary care hospitals of Karachi. The study population was observed for the prescribed pattern of antihypertensive medicines by assessing the 300 prescriptions of hypertensive patients with type II diabetes mellitus. Statistical analysis was performed using SPSS version 20. Data was presented as frequencies and percentages. **Results:** The result revealed that the most commonly prescribed single antihypertensive drug was Enalapril 66 (22%) followed by Amlodipine 63(21%), Ramipril 57(19%), Diltiazem 33(11%), Lisinopril 21(7%) losartan k 6(2%), Nebivolol 6(2%), Bisoprolol 3(1%). Dual therapy included Ramipril and Nebivolol 1(0.33%) and Amlodipine+Valsartan 35 (11.67%), Amlodipine+Valsartan+HCTZ 9 (3%) were the antihypertensive drugs prescribed as fixed dose combinations. **Conclusion:** The present study shows Enalapril belonging to Angiotensin converting enzyme inhibitor (ACEI) class of antihypertensive drugs is commonly used single antihypertensive agent and Amlodipine+Valsartan belonging to antihypertensive drug class calcium channel blockers and angiotensin receptor blockers was the most frequently prescribed fixed dose combination while managing hypertensive patients with type II diabetes mellitus.

Keywords: hypertension, prescription, type II diabetes mellitus and antihypertensive drugs

INTRODUCTION

Hypertension (HTN) is one of the world's most serious public health problems, about 1.4 billion individuals are suffering from HTN globally. (1-3). The prevalence of hypertension is greater in low-middle-income countries (31.5%) than in higher-income countries (28.5%) (6). The occurrence of HTN in Pakistan is increasing continuously; there are more than 33% of individuals over the age of 40 having HTN. The disease burden is increasing constantly due to inappropriate drugs prescriptions, lack of education, and lack of patient compliance (4, 5). Besides HTN, diabetes mellitus (DM) is also one of the major issues among developing countries. Among all types of diabetes, Type 2 diabetes Mellitus (T2DM) is the most prevalent in both developed and developing that may lead to the complications i.e. neuropathy retinopathy and nephropathy lead to increase the mortality rate(7).

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According to the Joint National Committee (JNC-8) guidelines, ACEIs, ARBs, thiazide diuretics, and CCBs should be used alone or in combination for the management of hypertension. If the target blood pressure is reached after initial therapy, then drug dose should be increased or combination therapy is prescribed. The existence of comorbidities such as diabetes mellitus should be properly considered while choosing an antihypertensive medication (5). Similarly, the prescriptions of oral hypoglycemic agent's appropriate consideration are essential. Oral hypoglycemic medications are divided into several categories. Physicians face a challenge in rationally selecting a regimen from a variety of classes, and the situation becomes more complicated when the patients have additional non-communicable illnesses, such as HTN. The combination therapy of ailments not only aeffects the patient`s economic status but also aeffects the quality of life.

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Prescribing pattern describe the nature and profile of drug usage, and compliance with regional, state, or national guidelines, such as uniform prescribing patterns, the use of drugs from the list of essential medicines, and the use of generic drugs. Appropriate prescription has a beneficial effect on adherence and disease prevention. Irrational prescription trend happens when wrong dose, wrong frequency, wrong duration of an antihypertensive medication is prescribed (8, 9). Inappropriate delivery of drugs may also result in additional costs suffered by the patient due to ineffective treatment and adverse drug reactions (10). The lack of progress and the occurrence of adverse drug reactions may contribute to a loss of trust between the patient and the clinician(5). The rational prescription of therapeutic regimen represents a physician's attitude towards selection of treatment from different classes of oral hypoglycemic and antihypertensive drugs. During prescription writing along with current ailment and comorbid the knowledge of safety and tolerability of regimen is also of prime importance because it leads to prevent the future hallmarks of the prescribed therapy. In this regard the current study aims to identify the Prescribing pattern of oral hypoglycemic and antihypertensive drugs in patients of public and private sector hospitals of Karachi.

METHODOLOGY:

A cross sectional study was undertaken for six months in medicine outpatient department at tertiary care hospitals of Karachi. The study enrolled 300 after taking written consent of the study participants (calculated at 50% proportion of population) that is the hypertensive patients with type II diabetes mellitus. The study population was observed for the prescribed pattern of antihypertensive medicines. Consecutive random technique was used to recruit the sample. Data regarding socio-demographic and the prescribed antihypertensive drugs was collected on self-developed questionnaire from 300 prescriptions of hypertensive patients with type II diabetes mellitus. Statistical analysis was performed using SPSS version 20. Data was presented as frequencies and percentages.

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RESULTS:

The sample size of the present study is 300 (N=300). Majority of the participants were Male 216 (72%) and 84 (28%) were females as shown in Figure 1.

Table 1. shows the age wise distribution of the study population. Among them highest number of patients i.e. 43.3% belong to 46-50 years of age category followed by 26.6% in 40- 45 years and 15.3% of 51-55years of age and least percent of the patients were from the age group of 56-60 years of age.

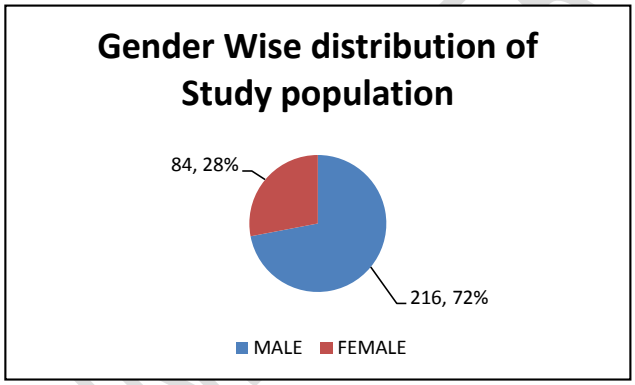

Figure 1: Gender distribution of Study Population

Table 1: Age Distribution of Study Population

S. No	Age Categories (Years)	Frequency (n)	Percentage (%)

1	40-45 years	80	26.6
2	46-50 years	130	43.3
3	51- 55 years	46	15.3
4	56- 60 years	44	14.6
	Total	**300**	**100**

While studying these hypertensive diabetic patients for the prescribed antihypertensive treatment, the antihypertensive therapy status was evaluated. As shown in table 2, the single therapy status 255 (85%) was the most prescribed pattern of antihypertensive drugs followed by 44 (14.67%) fix dose combination and 1 (0.3%) was therapy with dual antihypertensive drugs.

Table 2: Antihypertensive Therapy Status of the Prescribed Antihypertensive drugs

S. No	Antihypertensive Therapy Status	Frequency (n)	Percentage (%)
1	**Single Therapy**	255	85
2	**Dual Therapy**	1	0.3
3	**Fixed Dose Combinations**	44	14.6
	Total	**300**	**100**

Table 3 represents the prescribed antihypertensive drugs among the population under study, the result shows that the most commonly prescribed single antihypertensive drug was Enalapril 66 (22%) followed by Amlodipine 63(21%), Ramipril 57(19%), Diltiazem 33(11%), Lisinopril 21(7%) losartan k 6(2%), Nebivolol 6(2%), Bisoprolol 3(1%). Dual therapy included Ramipril and Nebivolol 1(0.33%) and Amlodipine+Valsartan 35 (11.67%), Amlodipine+Valsartan+HCTZ 9 (3%) were the antihypertensive drugs prescribed as fixed dose combinations.

Table 3: Prescribed Antihypertensive Drugs

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S.NO	ANTIHYPERTENSIVE DRUGS	NO. OF PATIENT (n)	PERCENT (%)
1	AMLODIPINE+VALSARTAN	35	11.67
2	ENALAPRIL	66	22
3	LISINOPRIL	21	7
4	BISOPROLOL	3	1
5	AMLODIPINE	63	21
6	LOSARTAN K	6	2
7	AMLODIPINE+VALSARTAN+HCTZ	9	3
8	RAMIPRIL , NEBIVOLOL	1	0.33
9	DILTIAZEM	33	11
10	RAMIPRIL	57	19
11	NEBIVOLOL	6	2
	TOTAL	**300**	**100**

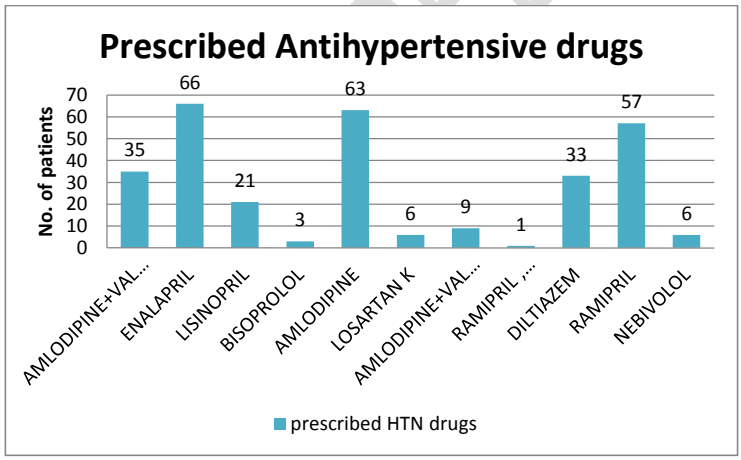

Figure 2: Prescribed Antihypertensive Drugs

DISCUSSION

It is significant to examine prescription trends. By conducting such surveys not only allows the health care system to conduct medical audits, but it is also helps to promote the community's overall health by facilitating a positive transition from traditional regimens to standardized, optimal therapy plan. The prescription pattern for these antihypertensive medications was determined to be considerately in accordance with the guidelines for hypertension prevention, detection, assessment, and treatment.

In current study the data was collected from~~of~~ 300 hypertensive diabetic patients, the majority of the study participants were men 216 (72%). Similar result was also reported in previous studies (5, 11-13)~~-~~. This study also found that hypertension and diabetes are more common in patients age category 46–50 years, same as reported in previous study by Zafar et al. (11, 13). According to the findings of the current investigation, single therapy status was shown to be the most commonly prescribed treatment plan for hypertension in individuals with type 2 diabetes. i.e. 255 (85%), in contrast, Zafar et al., revealed the highest number of prescribing trend is dual therapy i.e. 66% followed by single drug therapy (10%) (5). In current study the most common drug prescribed was Enalapril (ACEI) 66(22%) differ from previous study of Zafar et al., conveyed beta blocker that is (52%), in contrast to Ahmed et al., study most widely prescribed drug was CCB.

In present study highest prescribed fixed dose combination was Amlodipine (CCB-calcium channel blockers) + Valsartan(ARB-angiotensin receptor blockers) 35 (11.67%), same as previously reported study by Ahmed et al., that is CCB+ARB (18.6%)(5).

CONCLUSION

It is significant to examine prescription trends. By conducting such surveys not only allows the health care system to conduct medical audits, but it is also helps to promote the community's overall health by facilitating a positive transition from traditional regimens to standardized, optimal therapy plan. The prescription pattern for these antihypertensive medications was determined to be considerately in accordance with the guidelines for hypertension prevention, detection, assessment, and treatment.

The findings of this study will be incredibly helpful to Pakistani authorities in the development of evidence-based prescribing pattern, physician training on standard guidelines recommendations, and pharmacist recruiting for therapy and on-prescription rationality testing to improve patient health outcomes. Only in the presence of adequate and up-to-date information on present practices can rational and scientific attempts to enhance drug management systems be conducted.

LIMITATIONS OF THE STUDY

The study's limitation was limited data, in which data were obtained from only two institutions in Karachi, resulting in a population that is less diversified and hence not representative of Karachi as a whole.

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To get favorable, repeatable, and reliable results, large-scale research including a diverse population from throughout Karachi are required. Another limit of the study was the one-point analysis, which means there was no follow-up.

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