

SURVEY OF PRESCRIPTION PATTERN OF ANTIHYPERTENSIVE DRUGS IN HYPERTENSIVE AND DIABETIC HYPERTENSIVE PATIENTS

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ABSTRACT

Objective: This study was conducted in order to establish the drug prescribing trend of anti-hypertensive agents in hypertensives and diabetic hypertensives in General Medicine Department of Veer Surendra Sai Medical College and Hospital, Sambalpur, Odisha.

Methods: A prospective study of 2 months duration was conducted at the Veer Surendra Sai Medical College and Hospital, Sambalpur. The prescriptions containing antihypertensives were collected from the patients attending the outpatient department of general medicine. Pregnant women were excluded from the study.

Results: A total of 422 prescriptions were monitored, of which 285 were male and 137 were female. The age group of the patients varies from 35 to 75 years. Among 422 prescriptions, 118 prescriptions were of hypertensives and 304 prescriptions were diabetic hypertensives. Among hypertensives, 48% of patients were treated with anti-hypertensive drug combinations and 52% of patients were treated with single anti-hypertensive drug. 83% patients are suffering from primary hypertension (HTN) and only 17% patients suffering from secondary HTN. For the treatment of HTN, both monotherapy and combination therapy were followed. In monotherapy, amlodipine was most commonly prescribed followed by telmisartan. In combination therapy, a two-drug combination consisting of calcium channel blockers (amlodipine) and beta blocker (atenolol) were given to the majority of patients, followed by amlodipine and AT1 antagonist (telmisartan or olmesartan) combination. Among diabetic hypertensives, 31% of patients were treated with single anti-hypertensive drug and 69% of patients were treated with anti-hypertensive drug combinations. In monotherapy, beta-blocker (metoprolol) was most commonly prescribed. In combination therapy, a two-drug combination consisting of calcium channel blockers (amlodipine) and beta blocker (atenolol or metoprolol) were given to the majority of patients, followed by a combination of calcium channel blockers (amlodipine) and AT1 antagonist (telmisartan or olmesartan).

Conclusion: The present study represents the current prescribing trend for anti-hypertensive agents. According to JNC 7 guidelines, for Stage 1 HTN (systolic blood pressure [SBP] 140-159 or diastolic blood pressure [DBP] 90-99 mmHg), thiazides-type diuretics should be prescribed. For Stage 2 HTN (SBP \geq 160 or DBP \geq 100 mmHg), two drug combinations (usually thiazide-type diuretics and angiotensin converting enzyme inhibitors) should be prescribed. In our study, the prescription pattern does not follow the guideline.

Keywords: Hypertension, Prescription, Diabetes, Cardiovascular disease.

INTRODUCTION

Hypertension (HTN) (defined as a BP \geq 140/90 mmHg) is an extremely common comorbid condition in diabetes, affecting nearly 20-60% of patients with diabetes, depending on obesity, ethnicity, and age. HTN substantially increases the risk of both macrovascular and microvascular complications, including stroke, coronary artery disease, and peripheral vascular disease, retinopathy, nephropathy, and possibly neuropathy [1]. HTN is a disease of complex etiology, affecting 972 million people worldwide. Prevalence of HTN in India is reported to vary from 4 to 15% in urban and 2-8% in rural population. It is estimated that the worldwide prevalence of HTN would increase from 26.4% in 2000 to 29.2% in 2025 [2]. Therefore, BP control needs to be considered in conjunction with the control of other concomitant cardiovascular risk factors. The prevalence of HTN is high and the prescription containing antihypertensive drug is increasing day by day associated with other diseases such as diabetes, hyper-cholesterolemia, and cardiovascular disease. HTN and diabetes mellitus (DM) frequently coexist, which increases with age. HTN is about twice as common in patients with DM than in those without (8%) [3]. In U.K. Prospective Diabetes Study epidemiological study, each 10 mmHg decrease in mean BP was associated with reductions in risk of 12% for any complication related to diabetes, 15% for death related to diabetes, 11% for myocardial infarction and 13% for microvascular complications [1]. Drug utilization studies which evaluate and analyze the drug therapy in HTN and HTN associated with DM is very essential from time to time to

observe the prescribing attitude of physicians with the aim of rational use of drugs and to minimize the adverse drug reactions.

Hence, the present study was conducted in order to establish the drug prescribing trend of anti-hypertensive agents in hypertensives and diabetic hypertensives in General Medicine Department of Veer Surendra Sai Medical College and Hospital. This kind of medical audit highlights the present prescribing practice of physicians and help in improving the patient health care further.

METHODS

This is a prospective study conducted for a period of 2 months in the outpatient Department of General Medicine at Veer Surendra Sai Medical College and Hospital, Sambalpur, a tertiary care teaching hospital of Odisha. Patients with any stage of HTN with or without co-morbidities were included in the study. Pregnant women were excluded from the study. The prescriptions containing antihypertensives were collected from the patients attending the outpatient department of general medicine. The patient's demographics, BP, antihypertensive drugs prescribed, comorbid conditions were entered in a specially designed proforma.

RESULTS

A total of 422 prescriptions were monitored, of which 285 were male and 137 were female. The age group of the patients varies from 40

to 75 years. Among 422 prescriptions, 118 prescriptions were of hypertensives and 304 prescriptions were diabetic hypertensives.

Among hypertensives, 57 patients were under combination therapy i.e., 48% of patients were treated with anti-hypertensive drug combinations and 61 patients were under monotherapy, i.e. 52% of patients were treated with single anti-hypertensive drug. In combination therapy, only 5 patients i.e., 4% patients were prescribed 3 drug combinations and others were prescribed 2 drug combinations. Male patients were more than female patients (Table 1).

Among diabetic hypertensives, 31% of patients were treated with single anti-hypertensive drug and 69% of patients were treated with anti-hypertensive drug combinations. Only six patients (1.97%) were prescribed three-drug combination (Table 2).

In the case of hypertensive patients, calcium channel blockers (amlodipine) were most commonly prescribed in monotherapy. The use of amlodipine is followed by telmisartan and then metoprolol. Amlodipine-atenolol was the leading combination used by hypertensive patients (Table 3).

In the case of hypertensive diabetic patients, beta-blocker (metoprolol) was most commonly prescribed in monotherapy. The use of beta blocker is followed by amlodipine and telmisartan respectively. In combination therapy, a two-drug combination consisting of calcium channel blockers (amlodipine) and beta blocker (atenolol or metoprolol) were given to the majority of patients,

followed by a combination of calcium channel blockers (amlodipine) and AT1 antagonist (telmisartan or olmesartan). Some patients also prescribed combination of diuretics (hydrochlorothiazide) with AT1 antagonists (telmisartan or olmesartan). Combination of hydrochlorothiazide, amlodipine and olmesartan used in three-drug combination (Table 4).

DISCUSSION

A prescription-based survey is considered to be one of the most effective methods to assess and evaluate the prescribing attitude of physicians [4]. This study observed that HTN and diabetic HTN were more prevalent in male than in females. According to the work of Hansson *et al.*, BP could be adequately controlled with the help of combination therapy [5]. Furthermore, combination therapy seems to be a rational approach to reducing the cardiovascular mortality [6].

The present study revealed that beta blockers, calcium channel blockers and angiotensin converting enzyme inhibitors were the drugs of choice for hypertensives and diabetic hypertensives. Telmisartan improves glucose metabolism in hypertensive patients with the metabolic syndrome in addition to its anti-hypertensive effect. This effect may depend, at least in part, on specific peroxisome proliferator-activated receptor gamma agonism by telmisartan [7]. Amlodipine also affords cardioprotection by reducing oxidative stress induced in experimental myocardial infarction through prevention of free radical mediated injury of catecholamine assault [8]. Amlodipine had the most potent antioxidant activity as a result of distinct biophysical interactions with the membrane lipid bilayer [9]. Diuretics are generally recommended as first-line therapy for treatment of HTN (JNC VII) [10]. In the present study, overall utilization of diuretics as combination therapy was nearly 13% in diabetic hypertensive patients. The fixed combination of β -blocker and calcium channel blocker provides efficiency and tolerability in the treatment of arterial HTN [11]. Hence in our study, it was observed that beta blocker, AT1 antagonist and calcium channel blockers were most prescribed drug in both HTN and diabetic HTN. Only beta blocker, amlodipine and their combination were prescribed to nearly 51% patients of diabetic hypertensives. According to JNC 7 guidelines, for Stage 1 HTN (systolic BP [SBP] 140-159 or diastolic BP [DBP] 90-99 mmHg), thiazide-type diuretics should be prescribed. For Stage 2 HTN (SBP \geq 160 or DBP \geq 100 mmHg), two drug combinations (usually thiazide-type diuretics and angiotensin converting enzyme inhibitors) should be prescribed. In our study, 71% of patients in Stage 1 HTN and only 29% of patients in Stage 2 HTN.

Table 1: Drug therapy in hypertensive patients

Drug therapy	Male	Female	Total (%)
Monotherapy	43	18	61 (52)
Two drug combination	31	21	52 (44)
Three drug combination	3	2	5 (4)

Table 2: Drug therapy in diabetic hypertensive patients

Drug therapy	Male	Female	Total (%)
Monotherapy	53	42	95 (31)
Two drug combination	109	94	203 (67)
Three drug combination	4	2	6 (2)

Table 3: Antihypertensive drug therapy among hypertensive patients

Drug therapy	Drugs	Number of patients (% age of population)
Single drugs	Amlodipine	19 (16.1)
	Telmisartan	16 (13.5)
	Metoprolol	15 (12.7)
	Olmesartan	11 (9.3)
Two drug combinations	Amlodipine+(atenolol or metoprolol or carvediol)	21 (17.8)
	Amlodipine+(telmisartan or olmesartan)	18 (15.2)
	Hydrochlorothiazide+(telmisartan or olmesartan)	13 (11.0)
Three drug combination	Hydrochlorothiazide+olmesartan+amlodipine	5 (4.2)

Table 4: Antihypertensive drug therapy among hypertensive diabetic patients

Drug therapy	Drugs	Number of patients (% age of population)
Single drugs	Metoprolol	34 (11.2)
	Amlodipine	25 (8.2)
	Telmisartan	22 (7.2)
	Olmesartan	14 (4.6)
Two drug combinations	Amlodipine+(atenolol or metoprolol or carvediol)	92 (30.3)
	Amlodipine+(telmisartan or olmesartan)	79 (25.9)
	Hydrochlorothiazide+(telmisartan or olmesartan)	32 (10.5)
Three drug combination	Hydrochlorothiazide+olmesartan+amlodipine	6 (1.9)

CONCLUSION

The principal limitation of the study was that it was collected from the outpatient and thus not be representative of prescription patterns across the state. According to JNC 7 guidelines, for Stage 1 HTN (SBP 140-159 or DBP 90-99 mmHg), and for Stage 2 HTN (SBP \geq 160 or DBP \geq 100 mmHg) thiazides-type diuretics should be prescribed either in monotherapy or as single drug therapy. From this study, it was concluded that diuretics are not preferable choice for various types of HTNs. JNC 7 guideline is not followed in the present prescribing practice.

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