

MANAGEMENT OF HYPERTENSION IN PATIENTS WITH DIABETES MELLITUS

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ABSTRACT

Objective: To investigate the management of hypertension in patients with diabetes mellitus.

Method: An observational study was conducted in outpatient department of a cardiology hospital. Patients with either diagnosed hypertension or high blood pressure who attended the clinic were eligible for inclusion in the present study.

Result and Conclusion: The proportion of patients taking one antihypertensive medication is more in hypertension alone group (49.68%) than that of hypertension with diabetic group (23.53%). In two or three medications which are taken by the patients are significantly higher in hypertension with diabetes group (56.47%), (18.82%) than that of hypertension alone (41.93%), (5.81%) group. The study concluded that there are more difference in the prescribing pattern between hypertension alone and in hypertension with diabetes patients.

INTRODUCTION

It is well known that hypertension is a strong independent risk factor for coronary and cerebrovascular diseases, as well as for heart failure, atrial fibrillation and chronic renal failure, in both industrialized and developing countries,¹ thus substantially contributing to the global burden of disease. Moreover, it is well known that reducing blood pressure (BP) in hypertensive patients is associated with a significant reduction in the rate of cardiovascular complications and decline in renal function.^{2,3}

Diabetes and hypertension are the two faces of the same coin and they co-exist to the tune of 20 – 60% depending upon obesity, ethnicity and age of the person.⁴ Hypertension is twice as prevalent in a diabetic as compared to a non-diabetic. In type 2 diabetes, hypertension may be present at the time of diagnosis or even before the development of hyperglycaemia. While, in type 1 diabetes, hypertension develops after several years of the disease and usually reflects the development of diabetic nephropathy and ultimately affects 30% of individuals with type 1 diabetes.^{5,6}

Hypertension in diabetic patients is associated with accelerated progression of both micro vascular (retinopathy and nephropathy)¹³ and macro vascular (atherosclerotic) complications.⁷ Data from the National Institute of Health in the year 2000 have shown that approximately 73% of adults with diabetes mellitus use

antihypertensive medication or have blood pressure levels of >130/80 mm Hg.⁸ In India about 50% of diabetics have hypertension.

The objective of our work is to study the treatment differences between hypertension alone and hypertension with diabetes grouped patients.

METHODOLOGY

It was a six month observational study. The study was conducted in the outpatient department of a cardiology hospital. A total of 240 hypertensive patients participated in this study. Either sex ≥18 years old or who have diagnosed as hypertensive patients are included in this study. Patients who having either sex <18 years old and Patients with co morbid diseases other than diabetes mellitus are excluded from this study.

RESULT AND DISCUSSION

In total of 240 patients, 155 (64.58%) patients had hypertension and 85 (35.42%) had hypertension with diabetes mellitus. In the total 155 hypertensive patients; 78 (50.32%) male patients and 77 (49.68%) female patients are affected. A total of 85 hypertension with diabetes patients, 51 (60%) patients are male and 34 (40%) patients are female.

Table 1: Percentage of Antihypertensive Medications Used Per Patients.

Number of medications	Hypertension alone group		Hypertension with diabetes group	
	HT (n=15)	Percentage (%)	HT/DM (n=8)	Percentage (%)
0	2	1.29	0	0
1	77	49.68	20	23.53
2	65	41.93	48	56.47
3	9	5.81	16	18.82
4	2	1.29	1	1.18

HT:-Hypertension, HT/DM:-Hypertension with diabetes mellitus

Table 2: Class of Drug Prescribing Pattern in both groups.

Types Of Therapy	Hypertension	Hypertension with Diabetes mellitus
Monotherapy	β-blockers 34(44.16%) (n=77)	CCB 7 (35%) (n=20)
Two drug therapy	CCB+β-blocker 19(29.23%) (n=65)	ARB+CCB 17 (35.42%) (n=48)
Three drug therapy	ARB+Diuretics+β-blocker 4(44.44%) (n=9)	ARB+CCB+Diuretics 4 (25%)(n=16)
Four drug therapy	1).ARB+Diuretics+β blocker+CCB 1 (50%)	ARB+Thiazidediuretics+Loopdiuretics+
	2).CCB+ACEI+β-blocker+Diuretics 1 (50%) (n=2)	Aldosteron receptor blocker 1 (100%) (n=1)

CCB:-Calcium channel blockers,ARB:-Angiotensin receptor blockers,ACEI:-Angiotensin converting enzyme inhibitors.

Table 3: Drug Prescribing Pattern in both groups.

Types of therapy	Hypertension	Hypertension with Diabetes mellitus
Monotherapy	Metoprolol 20 (25.97%)	Amlodipine 5 (25%)
Two drug therapy	Amlodipine+Atenolol 16 (24.62%)	Telmisartan+Amlodipine 16 (33.33%)
Three drug therapy	Telmisartan+Hydrochlorothiazide+Metoprolol 3 (33.33%)	Telmisartan+Amlodipine+Metoprolol 7 (43.75%)

Drug Prescribing Pattern (Table 2 and 3)

In hypertension alone grouped patients β -blockers (44.16%) are mostly used classes in monotherapy. In that Metoprolol (25.97%) is mostly prescribed. In hypertension with diabetes grouped patients more antihypertensive medications are prescribed from Calcium channel blockers (CCB) (35%) as monotherapy in which amlodipine (25%) is mostly prescribed.

Enyioma¹⁰ concluded that the diuretics and β -blockers are appropriate as first line therapy in patients without coexisting conditions. The use of beta blockers in patients with diabetes has been discouraged because of adverse worsening of glucose tolerance and insulin sensitivity¹². This may be the reason that the less number of patients are treated with β -blockers in hypertension with diabetes group. The calcium channel blockers are mostly prescribed in hypertension with diabetes grouped patients, which is also reported by supratim *et al.*¹¹

In hypertension alone patients mostly used two drug combinations are Calcium channel blockers (CCB)+ β -blocker (29.23%) In which Amlodipine+Atenolol 16 (24.62%) combinations are mostly prescribed. In hypertension with diabetes mellitus grouped patients Angiotensin receptor blockers (ARB) + Calcium channel blockers (CCB) (35.42%) are mainly prescribed as two drug therapy. In which mostly prescribed drugs are Telmisartan+Amlodipine combinations (33.33%). Supratim *et al.*¹¹ conducted a study on antihypertensive drug use in patients having co morbid diabetes, according to that study ARB substantially lower risk for cardiovascular mortality especially in diabetes patients.

Angiotensin receptor blockers (ARB)+Diuretics+ β -blockers (44.44%) are mostly observed classes as three drug therapy in hypertension alone grouped patients. In which Telmisartan+Hydrochlorothiazide+Metoprolol combinations (33.33%) are mostly prescribed. In hypertension with diabetes grouped patients mostly used antihypertensive classes in three drug therapy are Angiotensin receptor blockers (ARB)+Calcium channel blockers (CCB)+Diuretics (25%). In which Telmisartan + Amlodipine + Metoprolol are mostly prescribed (43.75%) combinations. According to JNC VII guideline a diuretic is recommended for majority of hypertensive patients especially in decrease glomerular filtration rate or in heart failure. In failure to achieve goal BP in patients who are adhering to full doses of an appropriate three-drug regimen with a diuretic or in case of resistant hypertension.⁹

In four drug therapy two equal types of combinations are observed in hypertension alone patients; Angiotensin receptor blocker (ARB)+Diuretics-blocker+Calcium channel blocker (CCB) 1(50%); and Calcium channel blockers (CCB)+Angiotensin converting enzyme inhibitor (ACEI) + β -blocker + Diuretics 1(50%). In that Telmisartan + Hydrochlorothiazide + Nebivolol + Amlodipine, Amlodipine+Lisinopril+Bisoprolol+Hydrochlorothiazide 1(50%) are prescribed. In Hypertension with diabetes group, four drug therapy is observed in only one patient. In which Angiotensin receptor blockers (ARB) + Thiazide diuretic + Loopdiuretic + Aldosterone receptor blockers 1(100%) are observed .

In that Telmisartan+ Hydrochlorothiazide + Spiranolactone + Frusemide 1(100%) combinations are prescribed. According to algorithm for the treatment of hypertension in JNC VII additional drugs can add until goal blood pressure is achieved.⁹

Percentage of Antihypertensive Medications Used Per Patients (Table-1)

The proportion of patients taking one antihypertensive medication is more in hypertension alone group (49.68%) than that of hypertension with diabetic group (23.53%). In two or three

medications which are taken by the patients are significantly higher in hypertension with diabetes group (56.47%), (18.82%) than that of hypertension alone (41.93%), (5.81%) group. According to JNC VII majority of diabetic patients will require two or more drugs to achieve BP control.⁹

CONCLUSION

The result showed that there are more difference in the prescribing pattern between hypertension alone and in hypertension with diabetes patients. In hypertension alone group, majority of patients are treated with β -blockers and in hypertension with diabetes patients majority of patients are treated with Angiotensin receptor blockers (ARB). It means that the prescribing pattern follows the algorithm for the treatment of hypertension in JNC VII. Hypertension associated with Diabetes mellitus patients should have a higher awareness and better control of hypertension than having hypertension alone patients.

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