

Original article:

Cross-sectional Study of Use of Antihypertensive drugs in patients suffering from Type 2 Diabetes Mellitus at a tertiary Care Teaching hospital

Dr.Gireesh. A. S.

Assistant Professor, Department of General Medicine, Sri Siddhartha Medical College, Agalakote, Tumkur, Karnataka, India.

Corresponding Author: Dr.Gireesh. A. S. , Assistant Professor, Department of General Medicine, Sri Siddhartha Medical College, Agalakote, Tumkur, Karnataka, India.

ABSTRACT

Background: Association of Hypertension and diabetes has already been established. Hypertension is risk factor for development of diabetes as well for complications like nephropathy, CAD and neuropathy etc. Therefore, Hypertension control is vital to prevent and retard progression of microvascular and macrovascular complications. With this aim, we undertook this study to evaluate treatment patterns in diabetic patients with hypertension, those are being followed at our institute.

Methods: This study was conducted on diabetic patients suffering from hypertension as well. Prescribing Pattern of Antihypertensive drugs was analysed on all diabetic patients reporting to Department of General Medicine, Sri Siddhartha Medical College, Agalakote, Tumkur, Karnataka (India) were screened.

Results: Around n=402 patients were enrolled initially, only 345 patients completed our study. Out of n=345 patients, 180 were males and 165 were females. Mean age of group was 53.2 years. 36.18% patients were on monotherapy and remaining patients were on combination antihypertensive drugs. The total number of n=688 antihypertensive drug exposures. Angiotensin receptor blockers were the most commonly prescribed drugs. Angiotensin inhibitors (angiotensin receptor blockers and ACE inhibitors) were utilized in 71% patients.

Conclusion: Our study showed that majority of diabetic hypertensive patients needed multiple drug therapy to control hypertension. Most of the patients were on ARBs/ACE inhibitors.

Keywords: Diabetes, Hypertension, Antihypertensive drugs, Angiotensin receptor blocker

INTRODUCTION

Hypertension and Diabetes are way of life sickness and are the significant weight of worldwide Wellbeing because of complexities. India as of now has 40.9 million diabetic patients and it is relied upon to ascend to is required to ascend to 69.9 million by 2025 unless pressing and successful preventive strides are taken.¹ One and half billion people will suffer from hypertension² and 300 million will suffer from diabetes by 2025.³ Prevalence of hypertension is 60% in type 2DM.⁴ Patients with T2DM has two

fold higher chances of suffering from hypertension in comparison to age match subjects without diabetes.⁵ Hypertension has been appeared as a noteworthy hazard calculate for the improvement of diabetes as well as for the advancement of small scale and full scale vascular confusions like neuropathy, nephropathy, retinopathy, coronary supply route sickness, stroke, Fringe Vascular Infection (PVD) in diabetic patients. The advantages of Circulatory strain (BP) control in diabetic patients surpass the advantages of tight glycemic control and crucial

to the counteract and retard movement of both microvascular and macrovascular difficulties of hyperglycemias.⁶

There are restricted information from India in regards to doctor's decisions of against hypertensive treatments for a patient with diabetes in single-and numerous medication based regimens. Thusly, we attempted this review to assess treatment designs in diabetic patients with hypertension, those are being taken after at our organization.

METHODS

This study was conducted on diabetic patients who had hypertension as well. Prescribing Pattern of Antihypertensive drugs was analysed on all diabetic patients reporting to Department of General Medicine, Sri Siddhartha Medical College, Agalakote, Tumkur, Karnataka (India) were screened. Around n=402 patients were recruited on the basis of inclusion and exclusion criteria. Only n=345 patients completed the study. Patients with advance renal failure (serum creatinine >3.5 mg %) and patients with malignant hypertension were excluded. Patients were diagnosed hypertensive if they had at least 2 visits with diagnosis of hypertension or they had prescription of antihypertensive drug with one recording of elevated BP or they had elevated BP on two visits. Patients were diagnosed as diabetic if they had two visits with diagnosed of diabetes or they had prescription of antidiabetic drugs or insulin or raised glycosylated haemoglobin.

Antihypertensive drugs were grouped in to seven groups - Calcium channel blockers, beta blockers, diuretics, Alfa blockers, Angiotensin Convertase Enzyme Inhibitors (ACEI), Angiotensin Receptor Blockers (ARB), centrally acting drugs. Data for antihypertensive drugs was recorded in form of need of monotherapy, two drugs or three drugs therapy. Data for non-pharmacological therapy

was also recorded like salt restriction, loss of weight or exercise.

RESULTS

There were 345 patients in this study, who completed the study. Our study group comprised of n=180 males and n = 165 females. Demographic data of patients has been described in Table 1. Only 36.18% were on monotherapy and remaining patients were on combination antihypertensive drugs. There were total n=688 antihypertensive drug exposures Table 2.

Type of drug - Angiotensin receptor blockers were the most commonly prescribed drugs. Angiotensin inhibitors (angiotensin receptor blockers and ACE inhibitors) were utilized in majority of the patients. These were followed by calcium channel blockers, diuretics, and beta blockers Table 2.

Combination Utilization pattern - Angiotensin receptor blocker with diuretics was the most commonly used dual drug combination strategy in our study. It was followed by combination of beta blocker with calcium channel blocker, calcium channel blocker with angiotensin receptor blocker, ACE inhibitor with diuretic and ACE inhibitor with beta blocker. Combination of Beta blocker with calcium channel blocker and diuretic was most commonly used in patients on triple drug combination. Combination of ARB, diuretic with CCB was used in 33.3% and combination of Alfa blocker, BB and diuretic was used in 10.24%. Combination of ACEI, CCB with diuretic was used in 5.12% patients. Combination of ACEI/ARB, diuretic with centrally acting drugs was used in 15.9% patients. Majority patients (50%) on quadruple therapy were on combination of Alfa blocker, diuretic, ACE inhibitor and central agonist. Combination of Alfa blocker, diuretic, central agonist with CCB or ARB was used in remaining 50% patients.

Table 1: Showing epidemiology data.

Age (years)	Number	Male	Female
<35	16	12	4
35-50	165	84	81
50-75	150	78	72
>75	14	6	8
Total	345	180	165

Table 2: Showing utilization of various drugs.

Drug	No. of patients
Angiotensin receptor blocker	178
Calcium channel blocker	155
Diuretic	135
ACE inhibitor	125
Beta blocker	85
Alfa blocker	10
Central agonist	8
Total	688

Table 3: Description of combination utilization (Dual drug)

Drug Combination	Number
ARB+D	35
CCB+BB	22
ARB+CCB	20
ACEI+D	18
ACEI+BB	15
Total	110

DISCUSSION

Our study tried to find utilization of various antihypertensive drugs in diabetic hypertensive patients and awareness about hypertension. A prescription based study is an effective way to assess and evaluate prescribing altitude of physicians.⁷ Less No. of patients in our study were on Monotherapy and majority on Multiple Drug therapy. It is consistent with other similar studies.^{8,9}

Berlowitz et al.¹⁰ have shown worse BP control in patients with diabetes and less intensive anti-hypertensive medication therapy. ARB was the most common drug prescribed in patients either alone or in combination. ACEI/ARB were used in patients either alone or in combination. Most of the patients on single drug were receiving either ACEI or ARB. There is suggestion that ARBs should be a regular component of combination treatment and preferred drug in patients on

monotherapy in diabetics.¹¹ It has been described that initial monotherapy ACE inhibitors may be superior to dihydropyridine CCB in reducing cardiovascular events.^{12,13} Diuretics were used in 34% patients either as single or combination therapy. Diuretic use ranked third after CCBs and these were more commonly used as part of multidrug regimen. Dhanraj et al. described same pattern in their study on diabetic hypertensives.¹⁴ Beta Blockers were used in 26% patients. Usage of BB was significantly higher in patients with CAD in our study. BB has protective effect in CAD and other studies^{15,16} also found higher use of BB in patients with CAD.

ARB/ACEI with diuretic was the most commonly used combination therapy. It is consistent with other study. Patients with nephropathy needed higher no of antihypertensive drugs. Use of ACEI/ARB was higher in patients with nephropathy than without nephropathy. Blood

pressure control was achieved in 37.66% patients. Our control rates are better than other studies¹⁴⁻¹⁶ with control rate of 25-32%. Which may be due to difference in sample size. Patients with nephropathy had lesser percentage of patients with control of hypertension than patients without nephropathy. Awareness about hypertension was found in 81% patients. Asfaq et al. also found awareness in 80% patients attending tertiary care hospital.¹⁷

CONCLUSION

This study disclosed that majority of diabetic hypertensive patients were on multiple drug therapy to control hypertension. Most of the patients were on ARBs/ACE inhibitors. Patients with diabetes had lesser chance of control of hypertension. Still there is a need for better control of hypertension and optimization of antihypertensive therapy.

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