

Anti-Hypertensive Drug Utilization Pattern in Hypertensive Diabetic Patients, Jayanagar General Hospital, Bangalore

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Abstract

Objective: This study aimed to investigate the utilization patterns of antihypertensive specialists among hypertensive diabetic patients. **Methodology:** A prospective observational investigation was conducted for a period of 6 months in Jayanagar General Hospital, Bengaluru. We included 50 hypertensive diabetic patients with or without other comorbid conditions and patients aged below 18 years and pregnant women were barred. Point by point understanding data was gotten from patient's case sheet, including patient demographics, diagnosis and history of medical and medication details. The laboratory data details like blood pressure values, blood glucose values, etc. were noted down, documented in a suitably designed patient data collection form and investigated for use design concerning antihypertensive drugs. **Result:** Out of 50 patients, half were male and half were female. Most extreme patients had a place with age gathering of 50-60 years. Chronic Kidney Disease (18%) was the most widely perceived related disease with hypertension and diabetes mellitus. The greater part of the patients had gotten one antihypertensive medications (60%), followed by two (28%), three (10%) and four (2%) antihypertensive drugs. Amlodipine (CCB) was the most generally recommended antihypertensive drug (64%). **Conclusion:** Amlodipine and furosemide were the most every now and again endorsed antihypertensive drugs. Medicine of antihypertensive drugs for certain patients with convincing signs, were not in congruent with JNC 8 guidelines. This study highlights some therapeutic rationality in this health center. However, directed instruction of the remedy suppliers and dispersal of treatment guideline could encourage sound utilization of drugs and adherence to treatment guidelines.

Keywords: Hypertension, Diabetes Mellitus, Drug Utilization, JNC VIII, Treatment.

Introduction

Hypertension is among the main explanations in the absence office visits in fundamental consideration (Schappert and Nelson, 1999; Pittrow et al., 2004) and its treatment is once in a while even saw as a gauge for the general nature of social insurance frameworks (Hyman and Pavlik, 2000). In spite of the undisputed importance to treat hypertension compellingly, control measure is so far inadmissible (Guidelines committee, 2003; Chobanian et al., 2003). This holds particularly valid for the all-inclusive community in Europe contrasted with the US, with Germany having the least great result (Wolf-Maier et al., 2003). In the meantime, the new JNC-VII rules propose even lower BP targets, requiring patients with BP values of 120–139/80–89 mmHg as pre-hypertensive needing way of life change (Chobanian et al., 2003). Alongside such information, there is developing confirmation since uncontrolled hypertension also occurs in populaces with incredible access to human services (Alexander et al., 1999; DiPiro et al., 2008).

Hypertension (characterized as a blood pressure $\geq 140/90$ mmHg) is an incredibly regular condition in diabetes, influencing ~20-60% of patients with diabetes, contingent upon obesity, ethnicity, and age (Wolf-Maier et al., 2003). The headway of hypertension in patients with DM is especially hurtful, as it quickens the improvement of CVD and is evaluated to be in charge of up to 75% of diabetic cardiovascular complexities, including stroke, coronary artery disease and peripheral vascular illness. Hypertension is additionally thought to assume a noteworthy etiological guideline in the improvement of retinopathy, nephropathy and potentially neuropathy.

Internationally 26.4% of world grown-up populace had HTN (2000) and which is required to achieve 29.2% in 2025. Around 31% of the populace (72 million Americans) have high BP ($\geq 140/90$ mm Hg). The level of men with high BP is higher than that of ladies before the

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age of 45 years, however between the ages of 45 and 54 years the rate is slightly higher with ladies. After age 55 years, a lot higher percentage of women have high BP than men. Ongoing examinations from India have exhibited the normality of HTN to be 25% in urban and 10% in commonplace people on India. According to WHO surveys, the pervasiveness of HTN in Indians is 32.5% (33.2% in men and 31.7% in ladies) (DiPiro et al., 2008).

Hypertension is a vital hazard factor for CVD & is a noteworthy worldwide weight on public health. The prevalence of hypertension is high & the prescription containing anti-hypertensive drugs is increasing along with other diseases like diabetes, hyperlipidemia & CVD. The medication usage examines which assess and investigations the medication therapy in HTN & hypertensive diabetic patients is exceptionally basic to observe the prescribing practices of physicians with the point of balanced utilization of medications and to limit the adverse drug reactions (ADRs). Such examinations in this manner help in improving the patient social insurance further. Hence this study is proposed. Hypertension rules from the Eighth Joint National Committee (JNC 8) were published in 2013. In contrast to the JNC7 guideline recommendation, 2014 rule is driven by an efficient review of clinical trial proof and offers a lot of advantages over the previous one. Way of life proposals were likewise distributed in 2013 (DiPiro et al., 2008).

Diabetes and hypertension comprise an especially hazardous combination with regarding cardiovascular grimness and mortality. A significant increment in systolic circulatory strain in any age bunch prompts critical increment in cardiovascular disease. In this manner, it is important to lessen blood pressure (Lewington et al., 2002). Most patients with hypertension and diabetes require more than one authority to accomplish palatable heartbeat control. In the HOT (Hypertension Optimal Treatment) preliminary, 68% of patients were kept up on mix antihypertensive therapy. The mix of ACE inhibitors and CCBs is connected with an abatement in cardiovascular events and protein-urea (Tatti et al., 1998; Hansson et al., 1998; Tuomilehto et al., 1999; Wang et al., 2000). The combination of a dihydropyridine and a non dihydropyridine CCB has been appeared to have a synergistic circulatory strain bringing down potential (Gupta, 2004).

Carefully designed program of physical action can bring down BP. Normal physical activity for at any rate 30 minutes most days of the week is prescribed for all grown-ups. Cigarette smoking, while not thought about an auxiliary reason for basic hypertension, is a major, independent, modifiable hazard factor for CV illness. Patient with hypertension, who smoke ought to be guided in regards to the extra health risks that outcomes from smoking, in addition, the potential advantages that discontinuance can give ought to be disclosed to encourage cessation. fundamental goal of the examination was to assess the pattern of use of anti-hypertensive drugs in patients having diabetes mellitus

Materials and Methods

This study was carried out in Jayanagar General Hospital, Bengaluru which is a 400 bedded secondary care hospital. In order to record necessary data from the sources mentioned above, a self-designed Case Record Form was designed based on the data required for the study, which includes patient demography, family history, social history, medication history, clinical parameters like blood pressure and blood sugar levels, antihypertensive therapy and adjunct therapy.

Detailed patient information was obtained from patient's case sheet, including patient demographics, diagnosis, and history of medical and medication details. The laboratory data details like blood pressure values, blood glucose values, etc. were noted down. Details about the pharmacotherapy with respect to the use of anti-hypertensive drugs, dose, and mono and combination anti-hypertensive drug therapy were collected. The study patients' co morbid conditions as well as the therapy for such co morbid conditions were recorded. Screening and Initial Evaluation: A total restorative history with extraordinary accentuation on cardiovascular hazard factors and the nearness of diabetic and other cardiovascular complications were surveyed initially. Blood pressure was estimated at each normal diabetes visit.

Result and Discussion

A prescription study is viewed as a one of the best strategies to assess the prescribing mentality of specialists. It is likewise critical to consider the rules of universal regulatory relationship on the administration of hypertension that will improve recommending practice of the physicians and ultimately, the clinical guidelines. This training will in the end, help to advance rational utilization of medications. The examination on Antihypertensive Drug Utilization Pattern in Presence of Diabetes Mellitus included 50 patients. According to gender wise distribution it was found out that males and females were equally predisposed to hypertension.

In our prescription based study, the conspicuous discoveries were, out of 50 prescriptions, older guys over 51 years and females over 41 were most regularly influenced with hypertension. Just a single patient was found between 18-30 years of age group, this conveyance demonstrates that the higher age group of patients are progressively regular to be hypertensive and diabetic in nature.

Majority of the patients were suffering from only concurrent diabetes mellitus (40%). Other commonly associated conditions along with diabetes mellitus were chronic kidney disease (18%), COPD (16%), Chronic Liver Disease (10%), Bronchial Asthma (10%), Hypertensive Heart Disease (10%), and Ischemic Heart Disease (4%). Table 1

Table 1: Comorbid conditions

S.No	Comorbid conditions along with hypertension and diabetes	Total	Male	Female
1	Hypertension and Diabetes Mellitus only	20	7	13
2	CKD	9	3	6
3	HHD	5	3	2
4	IHD	2	2	0
5	COPD	8	5	3
6	Bronchial Asthma	5	2	3
7	CLD	5	4	1
8	Others	25	12	13

In our study, out of 50 patients we concluded that more than half of the patients had received only one antihypertensive drugs (60%), followed by two (28%), three (10%) antihypertensive drugs and four antihypertensive drugs (2%). Patients having diabetes along with hypertension had received one antihypertensive drugs (60%) most commonly, followed by two (25%), three (10%) and four (5%) antihypertensive drugs. Among the antihypertensive drugs, amlodipine (CCB) was the most commonly prescribed drug (64%) followed by furosemide (loop diuretic) (32%), telmisartan (ARB) (14%), losartan (ARB) (10%), prazosin (alpha blocker) (4%), clonidine (centrally acting alphaagonist) (4%), nifedipine (CCB) (4%), atenolol (beta blocker) (4%), metoprolol (beta blocker) (4%), bisoprolol (beta blocker) (2%) and enalapril (ACEI) (2%).Table 2,3. figure 1

Table 2: Number of prescriptions with anti-hypertensive medications

S.No	Anti-Hypertensive medications either given alone or in Combinations	Percentage of Prescriptions (%)
1	Patients treated with Calcium channel blocking agents	68
2	Patients treated with Beta -Adrenoceptor Blocking agents	16
3	Patients treated with Diuretics	32
4	Patients treated with ACE inhibitors	2
5	Patients treated with Alpha -adrenoceptor Blocking agents	4
6	Patients treated with Angiotensin Receptor Antagonist	24
7	Patients treated with Clonidine	4

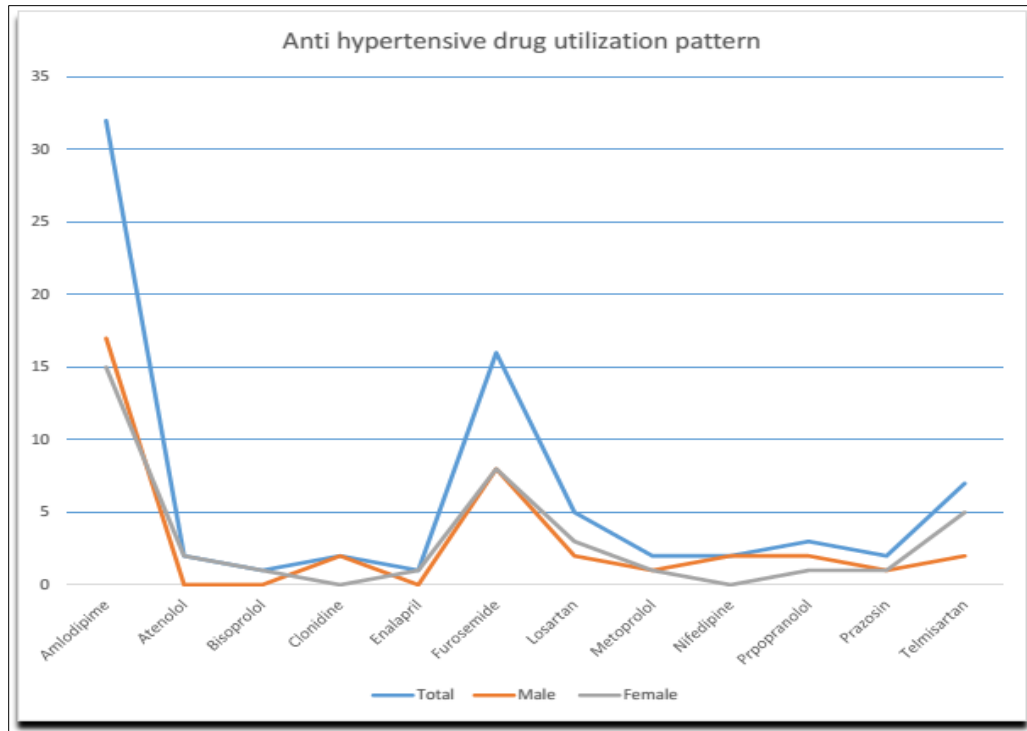


Figure 1: Antihypertensive drugs use pattern

Table 3: Number of combination therapy

Combination Therapy	No. of Prescription	Percentage (%)
CCB + Diuretics	5	25
CCB+ beta blocker	2	10
CCB+ ARBs	5	25
CCB+ Clonidine	1	5
Diuretics + Beta blockers	1	5
CCB + Diuretics + ARBs	3	15
CCB + Diuretics + Clonidine	1	5
Diuretics + ARBs + alpha blocker	1	5
CCB + Diuretics + ARBs+ Beta blockers	1	5

Out of 50 patients 3 were having type one diabetes mellitus and remaining were having type two diabetes mellitus. Among all the 50 patients more than half of the patients received only one antidiabetic drug (66%), followed by two (30%) and three (4%). The most preferred monotherapy was with insulin (32%) followed by metformin (22%). Among them, combination of metformin and glimepiride was the most commonly prescribed drug (24%). Figure 2, Table 4

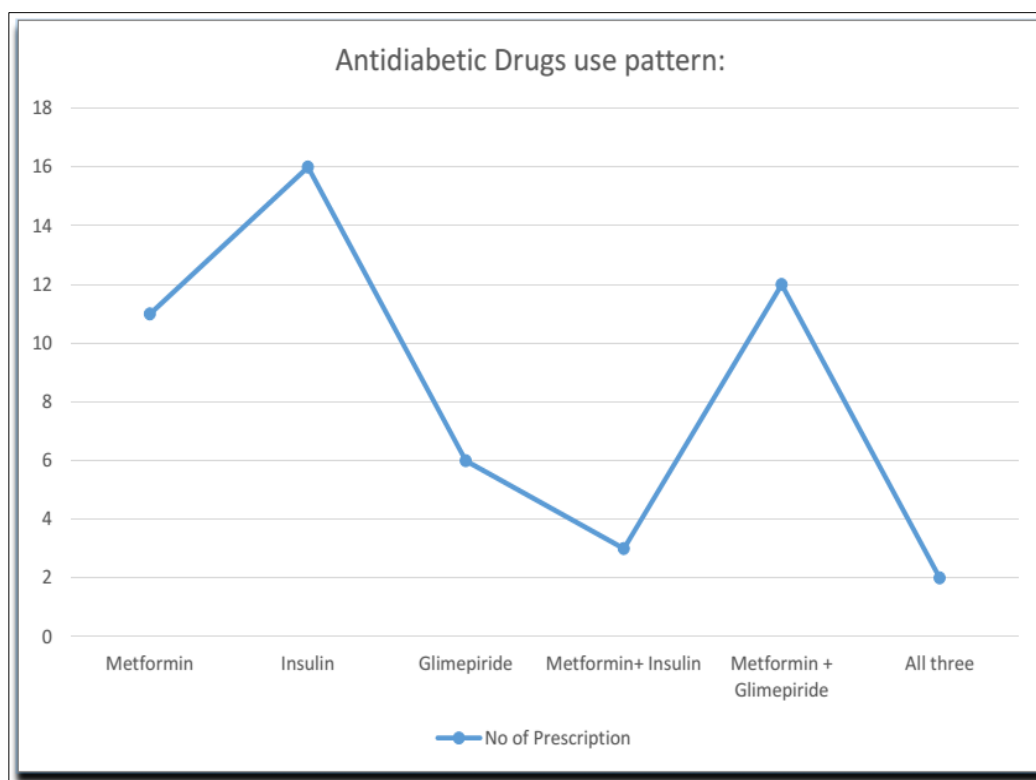


Figure 2: Antidiabetic drugs use pattern

Table 4: Therapy pattern of antidiabetic medications

Type of therapy	Medications Name	No. of Patients	Percentage %
Monotherapy	Metformin	11	22
	Insulin	16	32
	Glimepiride	6	12
	Total	33	66
Combination therapy	Metformin + Insulin	3	6
	Metformin + Glimepiride	12	24
	Metformin + Insulin + Glimepiride	2	4
	Total	17	34

In our overview, combination therapy was most broadly endorsed routine by the doctors. Earlier examinations have uncovered that a ideal mix must have antihypertensive medications having fundamental strategies for movement that furnish a synergistic contact with irrelevant adverse effects. Most hypertensive diabetic patients with commonplace renal limit require a combination of few antihypertensive administrators to cut down blood pressure to <130/80 mmHg; patients with going to perpetual chronic kidney disease may require at any rate three authorities. Combination therapy is required for ideal blood pressure control and prevention of cardiovascular, renal and neurological entanglements.

Out of 50 patients, we found that 8 (16%) patients were smoking alone in which 6(75%) were guys and 2 (25%) were females. It is additionally appeared, out of the entire examination populace (n=50), 8 (16%) patients were alcoholic in which 5(62.5) were guys and 3 (37.5%) were in female classification. Patients having propensity for both heavy drinker and smoking were observed to be 15 (30%) every one of them were guys. 19 patients have not had any habits referenced.

In this study, most regularly recommended monotherapy was calcium channel blocker (68%) trailed by loop diuretics (32%) all around once in a while ACE Inhibitor (2%) was utilized as a monotherapy.

In our survey two medication combinations, calcium channel blockers with loop diuretics were widely recommended by the doctors, next in line is the combination of loop diuretics and angiotensin receptor blockers, less as often as possible utilized two medication combination therapy was calcium channel blocker with clonidine or prazosin.

According to our examination three medication combination therapy, the most well-known classes of medications were calcium channel blockers, Angiotensin receptor blockers and diuretics. Less incessant combination is calcium channel blockers, diuretics and clonidine. In four medication schedule, Calcium channel blockers, beta blockers, Angiotensin receptor blockers, and diuretics were commonly used. In individual drug use classification, Amlodipine was most prescribed calcium channel blocker contrasted with Nifedipine. Propranolol was most supported beta blocker sought after by Metoprolol and a while later is Atenolol. The main Angiotensin changing over enzyme utilized was Enalapril. Among diuretics, just Furosemide was famously endorsed. Our investigation found that in diabetic patients, most generally utilized medication classes were calcium channel blockers pursued by Angiotensin receptor blockers which is opposition to different examinations that concludes the utilization of Angiotensin receptor blockers essentially dominating the utilization of calcium channel blockers. According to our study patients having diabetes along with hypertension had received one antihypertensive drugs (60%) most commonly, followed by two (25%), three (10%) and four (5%) antihypertensive drugs.

Conclusion

Amlodipine and furosemide were the most every now and again recommended antihypertensive drugs. Remedy of antihypertensive drugs for certain patients with convincing signs (specifically diabetes mellitus), were not in compatible with JNC 8 guideline. This study highlights some therapeutic rationality in this health center. However, directed training of the solution providers and spread of treatment guideline could encourage discerning utilization of drugs and adherence to treatment guidelines. Control of hypertension and upkeep of flawless circulatory blood pressure is the questionable issue that would benefit the diabetic patient. Drug specialists must end up being progressively careful about current standards for the treatment of patients with going with hypertension and type 2 diabetes mellitus. Techniques, for example, patient education and drug assessment can update for enhance care for these patients and development the movement to diabetic nephropathy. Various patients with diabetes mellitus and hypertension are not being treated by rules. Specific risk factors decided may help in distinguishing patients at high-risk for deficient treatment. Patient and training supplier, general health methodologies, and health system changes are expected to address these issues. As the populace becomes grows older and keeps on putting weight, diabetes and hypertension will turn out to be significantly increasingly normal.

One patient was found between 18-30 years of age group, out of 50 patients; we found that 22 patients were smokers alone in which 15 and 7 was guys and females individually. It is likewise appeared, out of the entire investigation populace, 18 patients were alcoholic in which 13 were guys and 5 were in female class. Patients having habit of both drinker and smoking were observed to be 11 and in that 6 were guys and 5 were females. Out of 50 patients 20 were found to have diabetes mellitus. Other commonly associated conditions were Chronic Kidney Disease (9), COPD (8), Chronic Liver Disease (5), Bronchial Asthma (5), Hypertensive Heart Disease (5), and Ischemic Heart Disease (2). In very few patient's dyslipidemia and anemia were also present. There mean estimations of raised systolic BP and GRB values demonstrate that the patients should be checked all the more intently. In a study it was observed that 30 patients were on monotherapy, the most common drug used is amlodipine, furosemide and 20 were on combination therapy, most common used drug is furosemide with amlodipine. For a treatment of diabetes. Among 20 patients 11 were treated with monotherapy for diabetes, in this metformin was commonly prescribed and 9 received combination therapy of metformin with glimepiride. In a combination therapy of antihypertensive and antidiabetic drug was found to be biguanides (metformin) with CCB (amlodipine).

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