

Original Article

Prescribing Pattern of Antihypertensive Agents Among Hypertensive Female with Chronic Kidney Disease in a Tertiary Level Hospital

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Abstract:

Background : Hypertension (HTN) is both a cause and effect of Chronic Kidney Disease (CKD). HTN control is important for those patients who are suffering from CKD. Now a days the prevalence of CKD is increased globally. It is a rising health problem and one of the major causes of mortality. Control of HTN plays a major role in preventing its progression to end stage kidney disease and death. The objectives of the study were to evaluate the class, dosing schedule of antihypertensive prescribed in CKD and the percentage of monotherapy and combination therapy. **Material and methods:** A cross-sectional, descriptive type of observational study conducted in the Department of Pharmacology in collaboration with the Department of Nephrology out patients' Department in Mymensingh Medical College Hospital, Mymensingh. **Results:** Among 113 patients females are only 32 who are suffering from CKD with HTN and common age group is 51-60 years. Most common comorbidity is DM in CKD with HTN. Most commonly used combination therapy is CCBs + ARB and it is 23.01%. **Conclusion:** It is concluded that in CKD with HTN, majority of patients were treated with combination therapy.

Keywords: Anti-hypertensive drugs, Chronic Kidney Disease, Monotherapy, Combination therapy, Prescription pattern.

Introduction:

Chronic Kidney Disease (CKD) is defined as the presence of reduced kidney function (an estimated glomerular filtration rate [eGFR] <60 mL/min/1.73 m² or kidney damage (often indicated by the presence of proteinuria) for ≥3 months' duration. Hypertension (HTN) defined by the European Society of Cardiology and the European Society of Hypertension (ESC/ESH) as a blood pressure (BP) of ≥140/80 mmHg affects ~ 30% of the general adult population and up to 90% of those with CKD.¹ Hypertension is not a disease but an important risk factor for development of CKD. The incidence and severity of hypertension may be increased due to a decline in

eGFR. On the other hand, CKD is the most common cause of secondary HTN and also an independent risk factor for cardiovascular morbidity and mortality. The prevalence of HTN is higher among patients with CKD, progressively increasing with the severity of CKD² The mechanisms of HTN in CKD includes volume overload, sympathetic over activity, salt retention, endothelial dysfunction, and alteration in hormonal systems that regulate blood pressure (BP)³. Many guidelines discuss the importance of BP control to decrease the progression of renal disease and decrease cardiovascular morbidity and mortality. However, in order to maintain adequate

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BP, it requires combination of antihypertensive agents often up to three or four classes. But many clinicians practice their own prescribing pattern according to their clinical experiences. This study is designed to assess the prescribing pattern of antihypertensive agents among CKD patients to control BP in the outpatient Department of Nephrology in Mymensingh Medical College Hospital. Findings of this study will give some idea about prescribing patterns in Bangladesh.

Method and Materials:

It was a cross sectional descriptive type of observational study. The study was carried out in the Department of Pharmacology & Therapeutics in collaboration with the Department of Nephrology, Mymensingh Medical College Hospital, Mymensingh, during the period from January 2021 to December 2021. All the data were collected from Department of Nephrology, Mymensingh Medical College Hospital, Mymensingh. Data were collected by interviewing the patients and reviewing patients’ prescription. Data were collected ensuring the privacy and confidentiality as far as possible. After completion of data collection, data analysis was done using SPSS version 20.

Inclusion Criteria:

- Female patient.
- Age group (41-80).
- Patient with diagnosed CKD with HTN with or without DM and CVD.
- Willing to be enrolled in the study with informed consent.

Exclusion Criteria:

- Patient not willing to give consent.
- Patients associated with some comorbidity other than DM, CVD.

Results:

This study was carried out to determine the pattern of drugs used for the hypertension with chronic kidney disease patients attending outpatient Department of Nephrology in Mymensingh Medical College Hospital in Bangladesh. A total of 113 patients coming to outpatient department of MMCH and among them 32 female patients were selected for the study. A cross-sectional descriptive type of observational study was conducted. Finding of the study are presented by graphs and tables.

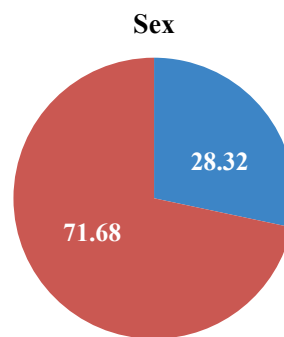


Figure 1: Sex distribution of the patient in CKD with HTN

Among 113 patients majority are suffering from CKD with HTN are males and they cover 71.68% of total patients and 28.32% were female patients suffering from CKD with HTN.

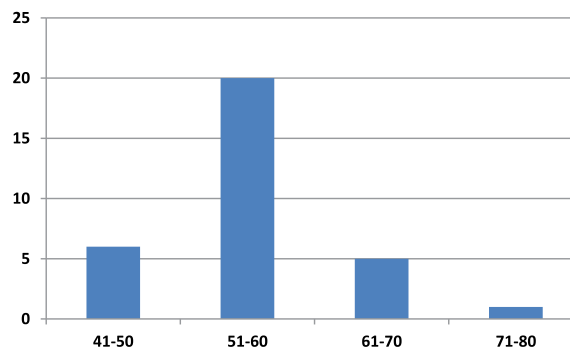


Figure 2: Age distribution of patients in CKD with HTN

Figure 1 shows that most common age group suffering from CKD with HTN is 51-60 years that consists 62.5% and second most common age group is 41-50 years which covers 18.75%

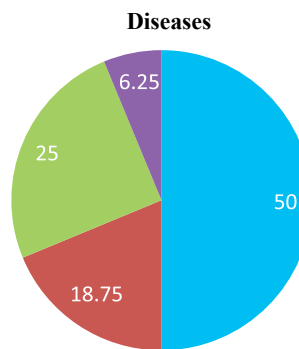


Figure 3: Comorbidities associated with HTN with CKD

Out of 32 patients CKD with co-morbidity was DM 16 (50%), IHD 6 (18.75%), DM with IHD 08 (25%) and without any co-morbidity 2 (6.25%).

Table 1: Anti hypertensive drugs prescribed in hypertension with CKD patients as mono therapy

Name of drugs	Number of patients	Percentage (%)
Calcium channel blocker	6	18.75
Angiotensine II receptor blocker	5	16.63
Beta blocker	3	9.38

Table 2: Anti hypertensive drugs prescribed in hypertension with CKD patients as combination therapy

Name of drugs	Number of patients	Percentage (%)
Angiotensine II receptor blocker + Calcium channel blocker	12	37.5
Angiotensine II receptor blocker + Beta blocker	3	9.38
Calcium channel blocker + Beta blocker	3	9.38

Table 3: Different therapy used in prescription (n=32)

Different therapy	No. of prescription	Percentage (%)
Monotherapy	14	43.75
Combination therapy	18	56.25
Total	32	100.0

Discussion

The rationality of the prescription can be assessed and evaluated using a prescription based study, one of the methods available for such purpose. Recommendation of the various international bodies on CKD with HTN has enhanced the prescribing practice of the physicians; moreover, clinical standards are also now available. CKD is a global health problem and one of the risk factors for CVDs. Prevalence of CKD is on the rise and hence its management is very relevant.³

In this study, 62.5% patients were in 51-60 years age group which is similar to the study conducted by Saju AP et al. and which is in contrast with the study done by Neethu Joseph where the age group was 60-69 years of patients were affected more. In the study of Thomas et al. suffered age group was 60-69 years and 50-59 years were more prone to developed CKD.^{4,6}

This study analysis showed that CKD with HTN occurs less in women than in men, which is confirmed by demographic characteristics showing men to suffer

more from CKD with HTN (71.68%) than women (28.32%). The unhealthy lifestyle and damaging effects of testosterone may lead to rapid deterioration of renal function in males whereas in females estrogen plays a protective role. Females appear to have protection against CKD and its progression to ESKD. The prevalence of CKD among female population is less in reproductive years and this scenario is reversed about 10 years later where females are more affected than male.^{4,7}

HTN is a strong risk factor for CKD and the existing guidelines recommend strict antihypertensive treatment, yet its control rates remain suboptimal.⁸ In the present study the most commonly prescribed antihypertensive were found to be CCBs (18.75%) which is similar to the study conducted by Neethu Joseph et al., Thomas et al. and Prabitha P et al.⁵⁻⁷ In this study the 2nd most common drug is ARB (16.63%) and the 3rd common is Beta blocker (9.38%).

CCBs do not accumulate in patients with impaired kidney function. The most frequently prescribed CCB in this study was cilnidipine which is a new (fourth) generation DHP. Cilnidipine blocks both L-type/N-type voltage gated calcium channels whereas other DHPs are strictly L-Type CCBs. Cilnidipine significantly reduces urinary albumin creatinine ratio unlike other DHPs which increases proteinuria. Additionally this drug reduces uric acid production. without adversely affecting serum uric acid level and reduced urinary uric acid/creatinine ratio. As hypertension causes sympathetic over activity, reduced nitric oxide production from vascular endothelium due to insulin resistance and this can lead on to unrestricted production of hypoxanthines which are uric acid precursors in the skeletal muscle causing myogenic hyperuricemia. More over cilnidipine suppresses RAAS activation, oxidative stress. There is no risk of hypotension or reflex tachycardia. Risk of pedal edema is also less with cilnidipine.⁷

In this study 56.25% of patients were on multiple drug therapy. Regarding on combination therapy patients were given multidrug therapy which is similar to the study conducted by Thomas et al., Ashok Kumar Malpani et al., Neethu Joseph et al. and Prabitha P et al. But in contrast with the study conducted by D.Giri Rajasekhar et al. however D.Giri Rajasekhar et al. showed monotherapy as most preferred type of therapy.^{5-7,9-11} Combination treatment is required for hypertension management in CKD according to the guidelines. In this study CCBs combined with ARBs 37.5% which is in contrast with the study conducted by Prabitha P et al. where CCBs + AA were frequently prescribed combination as alpha agonists interact minimally with other antihypertensive and they are valuable as adjunct therapy for resistant hypertension in CKD patients.⁷ ARBs were used more regularly than ACE inhibitors, because of the less tolerability. In this study 2nd most common combination was ARB + Beta blocker 9.38%. This prescribing trend

may be attributed to the goals of antihypertensive therapy to reduce blood pressure which is the major risk factor for CKD, to reduce the need for hospitalization and to reduce development of ESKD and prevent dialysis.

Conclusion

Hypertension and CKD are chronic diseases which are interrelated to each other and cyclic in nature. Treatment for HTN will help in the reduction of chances of development of cardiovascular complications, mortality rate and progression of CKD. Medical records of 32 patients were assessed in this study. The preferential drugs applied among the patients were CCBs and the most common CCB was Amlodipine & Cilnidipine followed by ARBs, Beta blockers, Diuretics, Alpha blockers, Both alpha & beta blocker, Centrally acting sympatholytic and vasodilators. This study revealed that multi drug therapy was more preferred than mono drug therapy. In multi-drug therapy dual therapy was the most preferred among the other multi drug therapy. The patients understanding about the disease and the importance of medication could be taking properly. CCBs were found to be the commonest prescribed antihypertensive as mono therapy and in combination therapy.

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