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STUDY ON THE IMPACT OF CLINICAL PHARMACY INTERVENTION IN ANTIHYPERTENSIVE THERAPY FOR CHRONIC KIDNEY DISEASE PATIENTS AT TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

Background and objective: Chronic kidney disease (CKD) has a prevalence of 8-16% worldwide. CKD is associated with complications including electrolyte imbalances, mineral and bone disorders, anemia, dyslipidemia, and HTN. Elevated BP leads to damage to blood vessels within the kidney, as well as throughout the body, this damage impairs the kidney's ability to filter fluid and waste from the blood, leading to an increase of fluid volume in the blood thus causing an increase in BP. In this study, we aimed to assess the effectiveness of pharmacist intervention on BP control in patients with CKD. Method: It is a prospective interventional study conducted on 86 patients who presented with hypertension and CKD for 6 months. Data was obtained from the patients by direct interaction and by evaluating case records. The medication adherence behavior was assessed using Morisky Medication Adherence Scale (MMAS). The patients were educated and given knowledge about the disease and modifiable risk factors and the importance of medication adherence. the effect of patient counseling was assessed by MMAS at baseline and after 1 month. The data was analyzed and reliability was assessed using paired T-test. Results: Out of 86 patients 74.41% were male and 22 female participants (25.582%). 84.88%(n=73) of patients shows a decreased BP after pharmacist counseling. MMAS score ranges from 5.79 ± 1.80 during the baseline to 6.77 ± 1.60 after the follow-up (P value<0.0001). Conclusion: The medication adherence sleep pattern and quality of life of patients improved significantly after pharmacist intervention in the study population at the follow-up time (P<0.0001). We conclude clinical pharmacists could play a vital role in improving medication adherence sleep quality patient knowledge and quality of life among CKD patients.

Key Words: Medication Adherence, Chronic Kidney Disease, Hypertension, Patient Counseling.

INTRODUCTION

CKD and Hypertension (HTN) are closely associated with an overlapping and intermingled cause and effect relationship. A decrease in kidney function is typically associated with an increase in blood pressure (BP), and sustained elevations in BP fastens the progression of kidney function decline.[1] The American Heart Association defines hypertension as a blood pressure of 140/90 mmHg

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or more and the CKD is estimated as a GFR less than 60 ml/min/1.73 m^2 for more than 3 months or a urine albumin-creatinine ratio (ACR) of more than 30 mg of albumin per gram of creatinine (30 mg/g).[2] Hypertension coexists in approximately 80 – 85 % of patients with CKD and in hypertensive patients about 15.8 % have CKD. The coexistence of hypertension and CKD results in increased difficulties to control BP levels.[3] Only 13.2% of hypertensive patients with chronic kidney disease had adequately controlled blood pressure (<130/80 mmHg).[4]

The newly updated hypertension guidelines developed by the American Heart Association (AHA) and the American College of Cardiology support an intensive

BP control in patients with established CKD. The threshold for high BP has decreased to 130/80 mmHg.[3] Achievement of a BP target of < 130/80 mmHg in CKD patients is difficult and requires lifestyle modifications and has to adhere to multiple antihypertensive medications.[4]

Due to polypharmacy, frequent medication adjustments, medically unstable nature of the disease, and restricted lifestyle, CKD patients are at a high risk of drug-related problems and non-adherence.[5] Non-adherence to prescribed oral medication is also a common issue with mean rates of non-adherence which is being reported as high as 67%.[6] The involvement of the clinical pharmacist in providing patient education can improve patient adherence to the medication by improving their knowledge of their medications and thereby lessen the burden of the prescribing physicians.[7]

A large body of evidence has linked various sleep behaviors or dysfunction which include abnormality in sleep duration, insomnia, snoring, and daytime dysfunction with the development and progression of CKD.[8]

Counseling by the pharmacist was found to be the most important factor in reducing blood pressure which is controlled by providing education.[9] Clinical pharmacist-provided patient education was effective in increasing the medication knowledge and adherence pattern of kidney patients with hypertension. The study aims to assess the impact of clinical pharmacy intervention in antihypertensive therapy for chronic kidney disease patients.[5]

METHODOLOGY
STUDY DESIGN

Our study design was a prospective interventional study. The study was conducted among the inpatient and outpatient departments of the Department of General Medicine in Karuna Medical College Hospital, Vilayodi, Chittur, Palakkad for a study duration of October 2021 to March 2022 (6months).

STUDY PARTICIPANTS

The study population was calculated based on Daniel's formula and was found to be 86 patients, who are treated with antihypertensive medications and have CKD with an age greater than 18 years and who are consented to the study. Patients having a cognitive impairment and having an active kidney transplant, pregnant patients, and patients with incomplete data on medical records are excluded from the study.

STUDY PROCEDURE

Approval from the Institutional Ethical Committee was obtained before the commencement of the study. Signed informed consent was obtained from all the participants before the study. Inpatient and outpatient care was taken from the department of general medicine of the hospital. A predesigned data entry form was used to collect the patient's information including age, gender, occupation, address, social history, past medical and medication history, laboratory reports, culture, and sensitivity reports, and medication charts and thereby analyzing the medication adherence of the patient. The distribution of antihypertensive drugs among the study population was also studied. The medication adherence was analyzed by asking a questionnaire. The medication adherence was analyzed using Morisky Medication Adherence Scale (MMAS). We counseled and also provided patient information leaflets (PIL) among the study population to attain blood pressure control by providing awareness related to the importance of adherence to antihypertensive drugs during their first visit.

STUDY TOOL

A specially designed data collection form was used to collect the patient details. Morisky Medication Adherence Scale is used to assess the adherence of patients to the treatment. Morisky's Medication Adherence Scale (MMAS) contains 8 questions. The answers for the MMAS scale were captured as yes or no. An answer of 'yes' is scored as zero and 'no' is scored as one for the first 7 questions except for the fifth question, where yes is scored as one and no is scored as zero.

STATISTICAL ANALYSIS

The collected data was entered in MS-Excel 2019 for calculating the percentage of various parameters. Paired student t-tests were used for comparison of MMAS, and BP during the first and second visits. The relationships between these variables were expressed as Mean± SD.

ETHICS POLICY

The study protocol was reviewed by the Institution Ethics Committee of Karuna Medical College Hospital, Vilayodi, Chittur, and the information collected during the study will be kept in high confidentiality.

TABLE 1: Distribution based on gender

	MALE	FEMALE
NUMBER OF PATIENTS(n=86)	64	22
PERCENTAGE (%)	74.41	25.58

Table:2 Distribution based on age

AGE GROUP	NO OF PATIENTS(n=86)	PERCENTAGE (%)
20-30	5	5.81
31-40	6	6.97
41-50	20	23.25
51-60	29	33.72
61-70	20	23.25
>70	6	6.97

Table 3. Distribution based on variation in blood pressure

Parameter	No of the patients with an increased level	Percentage (%)	No of the patients with a decreased level	Percentage (%)
BP(mmHg)	13	15.11	73	84.88

Table 4. Statistical analysis of BP during baseline and follow-up

PARAMETERS	SYSTOLIC BP (BASELINE)	SYSTOLIC BP (FOLLOW-UP)	P-VALUE
MEAN	161.84	143.08	< 0.0001
SD	17.91	11.42	
N	86	86	

Table 5. Distribution of medication adherence in CKD patients

MMAS 8	Baseline no of patients(n=86)	Percentage(%)	Follow up no of patients(n=86)	Percentage (%)
LOW ADHERENCE	49	56.97	12	13.95
MEDIUM ADHERENCE	36	41.86	73	84.88
HIGH ADHERENCE	1	1.16	1	1.16

Table 6. Statistical analysis of MMAS during baseline and follow up

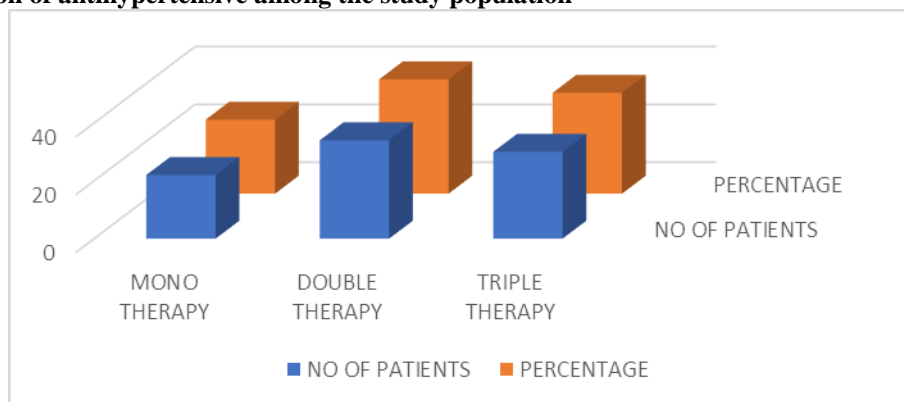| PARAMETERS	MMAS (BASELINE)	MMAS (FOLLOWUP)	P-VALUE
MEAN	5.79	6.77	
SD	1.80	1.60	
N	86	86	< 0.0001

Figure:1 Distribution based on the duration of hypertension

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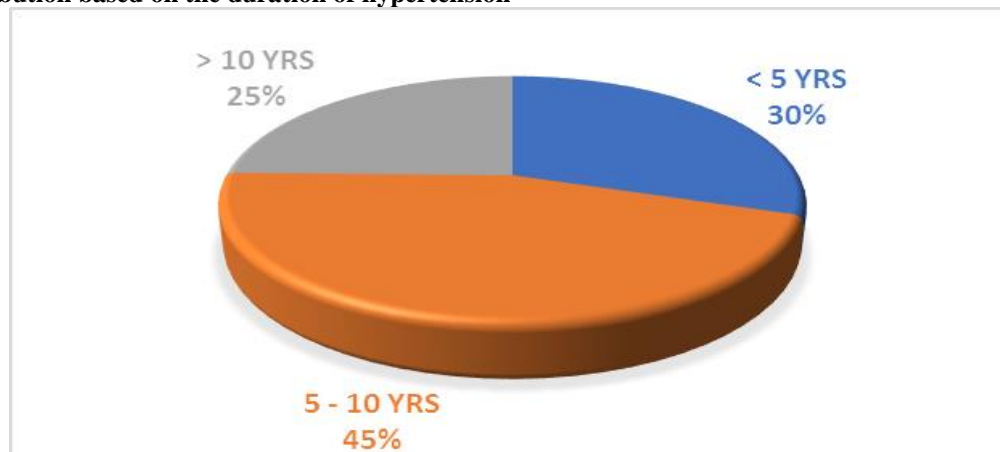
Figure:2 Distribution of antihypertensive among the study population

RESULT & DISCUSSION

A total of 86 patients were seen during the study collection period. There were 64 male participants (74.418%) and 22 female participants (25.582%). The mean age of participants in this study is 55.5±10 years, with about half of the study population being ≥ 40 years.

Table 1 shows that among the study population 74.41% (n=64) of male patients were more in number when compared with female patients 52.32 (n=22).

Table 2 shows the distribution of the disease in various age groups.5.81% (n=5) of patients come under the age group 20-30 years which is followed by 6.97% (n=6) in 31-40 years.23.25% (n=20) of patients lie in the range 41-50 years. The highest percentage comes under the age group 51-60 years, which is 33.72% (n=29). 23.25% (n=20) of patients are in the age group 61-70 years & 6.97% (n=6) belong to the age category >70 years.

Figure 1 explains the distribution of the study population based on the duration of hypertension. 45% (n=33) of patients are affected with the disease for 5-10 years, which is the highest duration of disease in our study. 25% of patients (n=18) are diagnosed with CKD and hypertension for about more than 10 years and less than 5 years for 30% of patients (n=22).

Table 3 shows the distribution of change in BP as a result of our intervention. 15.11% (n=13) of patients shows an increased level of BP or without any change after patient counseling. More percentage of patients comes under the category of patients with decreased BP level i.e., 84.88% (n=73) of patients show a decreased BP after the follow-up.

In Table 4, on statistically analyzing the BP during the baseline & follow-up, out of 86 patients 73 patients showed a decrease in their BP from 1.84±17.91 to 143.08±11.42 respectively.(P value<0.0001) i.e., the two-tailed p-value is less than 0.0001 which concludes that there is a difference in blood pressure in patients before and after patient counseling.

Table 5 shows the percentage of adherence in CKD patients toward the treatment. Initially before the patient counseling, i.e., during the baseline 56.97% (n=49) of patients are having low adherence to the treatment, which decreased to 13.95% (n=12) of patients after the patient counseling segment. Likewise, only 41.86% (n=36) of patients were having medium adherence to the medications initially which was increased to 84.88% (n=73) after the counseling.

Table 6 involves a statistical analysis of the adherence of patients to the medication during the baseline and follow-up. Out of 86 patients, 36 patients showed improved adherence to the medication. In which MMAS score ranges from 5.79±1.80 during the baseline to 6.77±1.60 after the follow up (P value<0.0001) which concluded there is a difference in medication adherence in patients before and after patient counseling.

There are some limitations to this study that should be considered while interpreting the result. First is the small sample size. The short duration of follow-up of the study patients is another limitation.

CONCLUSION

The study highlights the effectiveness of clinical pharmacist activity in improving medication adherence and controlling BP in CKD patients with hypertension.

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