

A Prospective Study on Risk Factors and Drug Utilisation Review Based On Clinical Profiles in Chronic Kidney Disease in A Government General Hospital

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Abstract

Aim: The aim of the study is to determine the most prevalent risk factor and the Drug Utilization Review among the inclusion criteria in chronic kidney disease patients in a tertiary care hospital. Our Secondary aim is to evaluate the risk factors and educating the patients regarding disease through which further complications are going to be reduced.

Objectives: Collection and study of patient's clinical profiles Study of various risk factors causing chronic kidney disease in inclusion criteria. Monitoring of Adverse Drug Reactions if any and Observation of patient medication adherence through drug utilization review.

Materials and Methods: A prospective observational study was conducted on 208 patients from nephrology department at Government General Hospital, Kurnool. The patient's were selected based on inclusion and exclusion criteria. Patients with high creatinine levels, past history, Demographic details, History of present illness, Treatment history, Past psychiatric/medication history, Family history, Personal history and allergies, Laboratory investigations, Diagnosis, Drug chart, Risk factors, and Patients on dialysis.

Results: Among the study conducted in renal impairment patients the majorly occurring risk factor is hypertension. The mostly affected patients with hypertension are seen under the age group of 41-50. Pedal edema, facial puffiness, decreased urine output, burning maturation, shortness of breath, abdominal pain and/or abdominal distension were the most common presenting complaints. Serum creatinine levels were more 5-21.5 mg/dl. All patients' treatment was evaluated and found that effective treatment was provided.

Conclusion: The study was carried out in an attempt to find out the risk factors for the progression of CKD at government hospital. The study showed an active involvement of clinical pharmacists in nephrology department. Most of the patients attending the nephrology department with risk factors such as hypertension were under the age of forty one to fifty. We studied the risk factors in inpatient. The incidence of the renal disorders is mostly seen in hypertensive condition.

Key Words: CKD, Adverse Drug Reactions, Nephrology

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I. Introduction

Chronic kidney disease is an irreversible loss of kidney functions due to the continues damage of kidney tissue over a period of three months either with the decrease or increased GFR which results in failure of both the kidneys. This leads to the disturbance of excretory functions, endocrine functions, haemopoietic functions and with the abnormal regulation of acid-base regulation in the body. Here we consider GFR which falls below 30ml/min/1.73m² and in some can remain asymptomatic. When GFR falls below 15-20ml/min/1.73m² can affect body systems.

Stages of CKD

Stage 1 – GFR of 90 mL/min/1.73 m² ,90 % kidney function ,possibly symptoms free.

Stage 2 – GFR 60–89 mL/min/1.73 m², in this 60 to 89 % kidney function, some symptoms may appear

Stage 3a – GFR 45–59 mL/min/1.73 m²

Stage 3b- GFR 30-44mL/min/1.73 m² , in this stage 3 about 40 to 59 % kidney function ,symptoms like changes in urination, swelling of extremities, kidney pain .

Stage 4 – GFR 15–29 mL/min/1.73 m², in this about 15 to 29 % kidney function occurs, and symptoms like hypertension, anaemia , bone diseases, other heart related problems.

Stage 5 – GFR less than 15 mL/min/1.73 m² it is end stage renal disease (ESRD) or treatment by dialysis or renal transplantation needed.

EPIDEMIOLOGY:

The economic and social consequences of CKD are taken into consideration. In many countries, the prevalence of CKD stages three to five (eGFR less than 60mL/min/1.73m²) are estimated around 5 to 7 percent that affects people with above 65years of age group. The widespread of CKD in patients with hypertension, diabetic mellitus and vascular disease is subsequently higher. More than 25percent of the population aged over 75years have an eGFR of less than 60mL/min/1.73m², mostly stage 3 chronic renal failure patients are at a high risk of cardiovascular disease. In these patients, investigation and management should be focused on cardiovascular risk prevention, as very few will ever develop end stage renal disease. Many of the primary renal diseases, however are more common in elderly patients so investigation is warranted for those with declining renal function or with haematuria/ proteinuria on dipstick .

ETIOLOGY

The Prevalent causes of CKD :

- Diabetes
- Hypertension
- Glomerulonephritis
- Urinary tract infections
- Polycystic kidney disease
- Analgesic nephropathy

Diabetes:

Type II diabetes is a heterogenous condition resulting from a combination of increased requirement for insulin and reduced insulin secretion. In this case, the pancreas does not produce enough insulin, this results in the abnormally high level of blood glucose.

In CKD patients excess amount of glucose more than the normal range which is commonly called as sugar in the human body damages the kidney. Meanwhile the functioning of the kidneys become weak that they don't filters the wastes and other materials from the blood.

A protein called albumin regulates colloid osmotic pressure in the body and keeps healthy .This is passed out from the blood and urine when a body is affected with kidney disease. A healthy and good functioning of the kidney do not allow albumin to pass into the urine from the blood and this is called Diabetic kidney disease.

II. Materials And Methods

STUDY DESIGN: A Prospective observational study

STUDY DURATION: The present study was carried out for a period of 6 months from

STUDY SITE: Nephrology department, Inpatient unit of Government General Hospital , Kurnool.

SAMPLE SIZE: During the study of six months, the total of 208 cases was collected and studied.

SOURCE OF DATA:

All the patients satisfying the inclusion criteria were selected from a nephrology department in Government General Hospital, Kurnool.

All the required data was collected from patients through personal interview and case sheets.

Inclusion criteria:

1. Patients of both sexes with,
2. Patients with H/O diabetes mellitus.
3. All patients of either sex above the age group of >14 yrs who are diagnosed with CKD.
4. Patients with anemia.
5. Patients on hemodialysis.

Exclusion criteria:

1. Patients with acute kidney injury.
2. Patients with age group of <12 years are excluded.
3. Chronic kidney disease: stage-I, stage-II stage-III&IV are excluded, because these are not much life threatening than stage – V.

METHOD OF COLLECTION OF DATA:

- All the patients were satisfying the inclusion criteria were selected from the nephrology department in Government General Hospital, Kurnool.
- All the data of the subject are collected by using the proforma
- The data collection includes Demographic details, History of present illness, Treatment history, Past psychiatric/medication history, Family history, Personal history and allergies, Laboratory investigations, Diagnosis, Drug chart, Risk factors, and Patients on dialysis.

SATISTICAL ANALYSIS:

- The data collected from the participants were entered into a PRISM 8 32 bit spreadsheet and descriptive statistics were used. All the statistical analysis was done by using Graph pad prism, .
- Parametric data were summarized as the mean (+) standard deviation for continuous variables. Categorical variables were summarized as percentages.
- Two way ANOVA was used for continuous variables. Confidence intervals 95% as set as a level of significance.

III. Results

A total of 208 patients were enrolled in the study are presented to the inpatient nephrology department, in Government General Hospital in which the 63 patients are identified with hypertension, 56 are identified with HTN-DM, 20 were diabetic mellitus, 9 were DM-HTN-NSAID abuse, 8 were NSAID abuse, 8 were HTN-CIN, 7 were CIN, HTN-NSAID were 6, 5 were HTN-CGN, 4 were obesity, where as 4 were CGN, 3 were HTN with CGN with CIN, 3 were DM-HTN-CGN, 2 were DM-NSAID, 2 were HTN-obesity, 1 with NSAID-CGN, 1 with NSAID-CIN, 1 with HTN-NSAID-CIN, 1 with DM- CGN , 1 with DM-Obesity, and 1 with DM-HTN-NSAID-CIN .

AGE AND GENDER DISTRIBUTION:

A total of 208 patients are presented to the inpatient department, the percentage distribution of the study population showed that 55(26.44%) females and 153(73.55%) males which are represented in the table:

Total distribution of patients with age group shows that majority of patients were found in between the age group 41-50 years 73(35.09%) ,followed by 51-60 years 45(21.63%).

The above results were represented in table:

Total distribution of patients age group based on gender shows that the majority of patients in males and females were found in between age group 41-50 years males 55 (35.09%), female 18 (32.7%) which are represented in the table. The mean age with a standard deviation in the study was 9.16±4.7 and 25.5±17.51 years in males and females respectively. No significant difference of age on gender was found while patients attending inpatient nephrology (P <0.03).

Table:-1 AGE AND GENDER DISTRIBUTION

Gender	<30	31-40	41-50	51-60	61-70	>71
Female	9(16.3%)	9(16.3%)	18(32.7%)	9(16.3%)	6(10.9%)	4(7.27%)
Male	10(6.53%)	25(16.33%)	55(35.94%)	36(23.52%)	17(11.11%)	10(6.53%)
Total	19(9.13%)	34(16.34%)	73(35.09%)	45(21.63%)	23(11.05%)	14(6.73%)

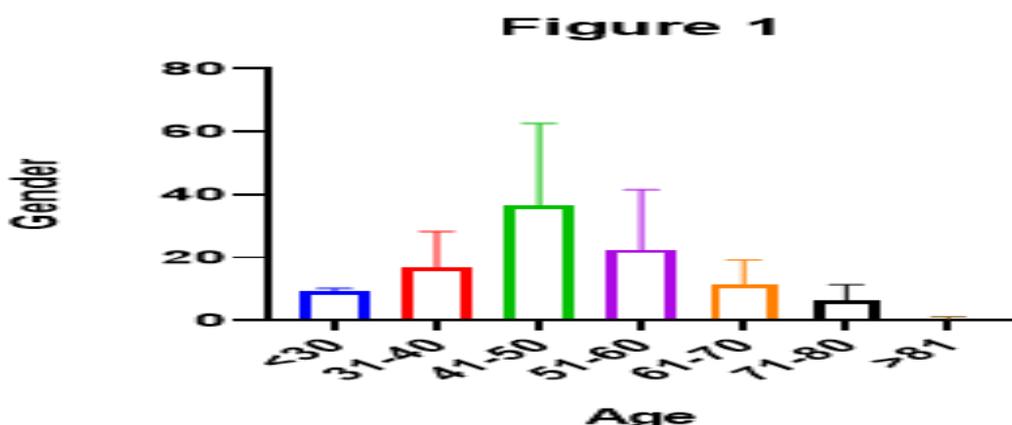


Fig. no.14 Age and Gender Distribution

DISTRIBUTION OF PATIENTS BASED ON DIAGNOSIS:

A number of patients suffering from a particular disease so the data can be expressed as percentages, not in mean ± Standard Deviation. A total of 208 patients were enrolled in this study, the percentage distribution of patients based on diagnosis shows that the majority of patients were identified with Hypertension 63(32.28%) , Diabetic Mellitus 20(9.61%), NSAID abuse 8(3.84%), Contrast Interstitial Nephritis 7(3.36%), Obesity 4(1.92%), Chronic Glomerular Nephritis 4(1.92%), where as in combination diseases HTN+DM 56(26.92%), DM+HTN+NSAID abuse 9(4.32%), HTN+CIN 8(3.84%), HTN+NSAID abuse 6(2.88%), HTN+CGN 5(2.40%), HTN+CGN+CIN 3(1.44%), DM+HTN+CGN 3(1.44%), DM+NSAID abuse 2(0.96%), HTN+ Obesity 2(0.96%), NSAID abuse +CGN 1(0.48%), NSAID+CIN 1(0.48%), HTN+NSAID abuse + CIN 1(0.48%), DM+CGN 1(0.48%), DM+ Obesity 1(0.48%), DM+CIN 1(0.48%), DM+HTN+ Obesity 1(0.48%), DM+HTN+NSAID+CIN 1(0.48%). Majority of the single disease was found to be 106(50.96%), where as combination diseases was found to be 102(49.03%). Was represented in below table

Table 2. DISTRIBUTION OF PATIENTS DIAGNOSIS

S.No	Diagnosis	No. of Patients	Percentage (%)
1.	Hypertension	63	32.28%
2.	Diabetic Mellitus	20	9.61%
3.	NSAID abuse	8	3.84%
4.	Contrast Interstitial Nephritis	7	3.36%
5.	Obesity	4	1.92%
6.	Chronic Glomerular Nephritis	4	1.92%
7.	HTN+DM	56	26.92%
8.	HTN+DM+NSAID abuse	9	4.32%
9.	HTN+CIN	8	3.84%
10.	HTN+NSAID abuse	6	2.88%
11.	HTN+CGN	5	2.40%
12.	HTN+CGN+CIN	3	1.44%
13.	HTN+DM+CGN	3	1.44%
14.	DM+NSAID abuse	2	0.96%
15.	HTN+ Obesity	2	0.96%
16.	NSAID abuse +CGN	1	0.48%
17.	NSAID Abuse +CIN	1	0.48%
18.	NSAID Abuse +HTN+CIN	1	0.48%
19.	DM+CGN	1	0.48%
20.	DM+ Obesity	1	0.48%
21.	DM+CIN	1	0.48%
22.	DM+HTN+ Obesity	1	0.48%
23.	DM+HTN+ NSAID+ CIN	1	0.48%

Figure.2

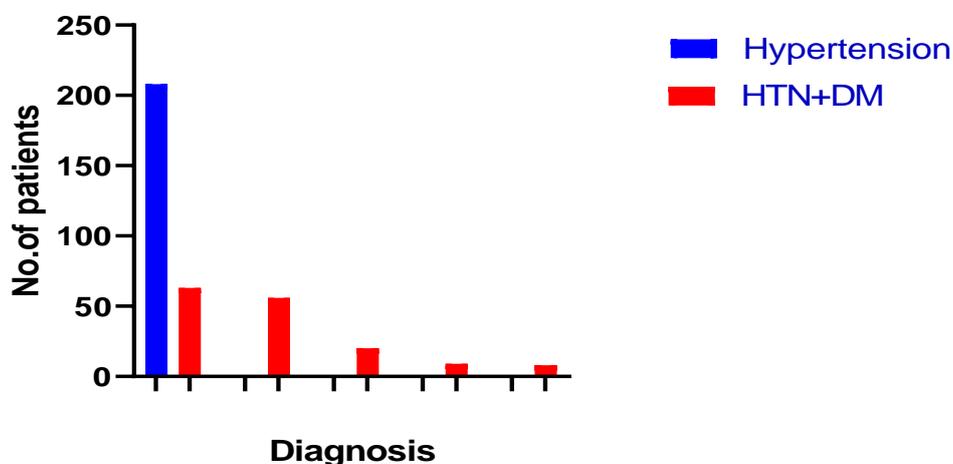
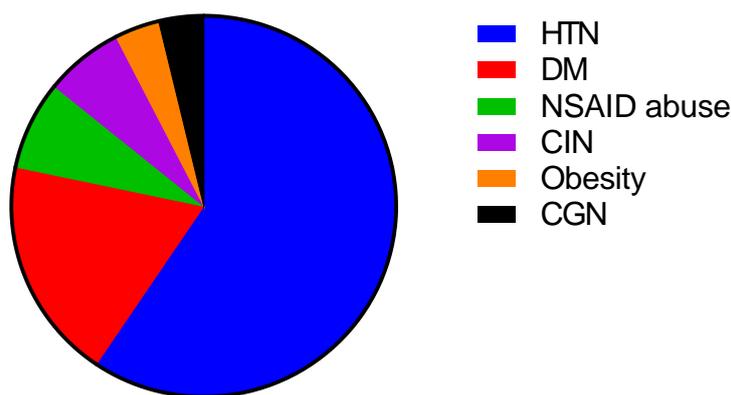


Fig.No.15 distribution patients based on diagnosis

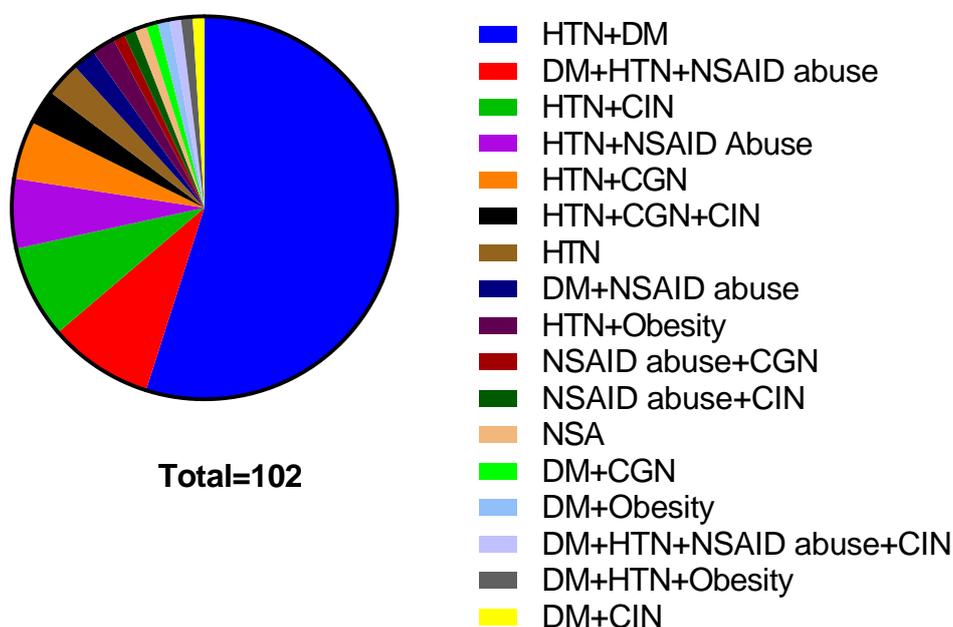
Patients with single disease



Total=106

Fig. no. 16 patients with single disease

Patients with multiple diseases



Total=102

Fig. no. 17 patients with multiple disease

GENDER DISTRIBUTION OF GFR BASED ON SERUM CREATININE LEVELS:

Among 208 patients the percentage of gender distribution on GFR based on serum creatinine levels, the majority of patients were males with GFR levels 5-10mg/dl was 76(44.97%), with GFR levels 10-15mg/dl was about 93(55.02%), where females with GFR levels 5-10mg/dl was about 5(12.82%), with GFR levels 10-15mg/dl was about 34(87.17%)

Table: 3 GENDER DISTRIBUTION OF GFR BASED ON SERUM CREATININE LEVELS

S.No	Gender	GFR levels (5-10mg/dl)	GFR levels (10-15mg/dl)	Total
1.	Males	76 (44.97%)	93(55.02%)	169
2.	Females	5 (12.82%)	34(87.17%)	39

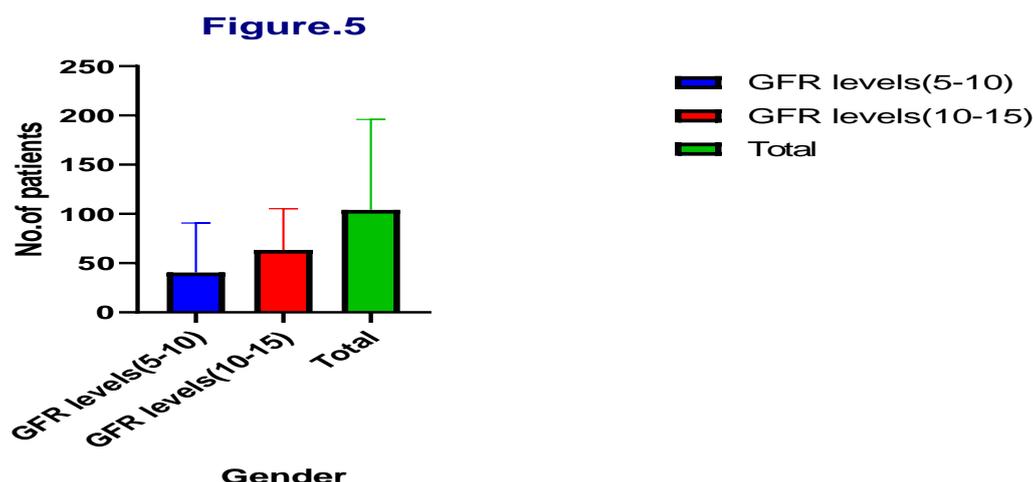


Fig. no.18 gender distribution of GFR based on serum creatinine

Distribution of patient diagnosis based on gender:

Among 208 patients, the percentage distribution of patients diagnosis based on gender shows that the majority of patients in Hypertension was males 49(31.41%), females(32.69%), Diabetes mellitus was males 15(9.6%), females 4(7.69%), Analgesic abuse was males 3(1.92%), females 4(7.69%), Chronic- Glomerulo nephritis was males 3(1.92%), females 1(1.92%), Chronic-interstitial nephritis was males 5(3.20%), females 2(3.84%), Obesity was males 2(1.2%), females 2(3.84%), HTN+DM was males 43(27.56%), females 12(23.07%), HTN+DM+NSAID abuse was males 9(5.76%), HTN+CIN was males 6(3.8%), females 3(5.76%), HTN+NSAID abuse was males 4(2.56%), females 3(5.76%), HTN+CGN was males 4(2.5%), females 1(1.92%), HTN+CGN+CIN was males 3(1.9%), HTN+DM+CGN was females 1(1.92%), DM+NSAID abuse was males 1(0.64%), HTN+ Obesity was males 2(1.2%), females 1(1.92%), NSAID abuse +CGN was 1(0.64%), NSAID Abuse +CIN was females 1(1.92%), NSAID Abuse +HTN+CIN was females 1(1.92%), DM+CGN was males 1(0.64%), DM+CIN was males 1(0.64%), DM+HTN+ Obesity was males 1(0.64%), DM+HTN+ NSAID+ CIN was males 1(0.64%).

Table.4 DISTRIBUTION OF PATIENT DIAGNOSIS BASED ON GENDER

S.No.	Diagnosis	Males	Females	Total
1.	Hypertension	49(31.41%)	17(32.69%)	66
2.	Diabetic Mellitus	15(9.6%)	4(7.69%)	19
3.	NSAID abuse	3(1.92%)	4(7.69%)	7
4.	Contrast Interstitial Nephritis	5(3.20%)	2(3.84%)	7
5.	Obesity	2(1.2%)	2(1.2%)	4
6.	Chronic Glomerular Nephritis	3(1.92%)	1(1.92%)	4
Multiple Diseases				
7.	HTN+DM	43(27.56%)	12(23.07%)	55
8.	HTN+DM+NSAID abuse	9(5.76%)	0	9
9.	HTN+CIN	6(3.8%)	3(5.76%)	9
10.	HTN+NSAID abuse	4(2.56%)	3(5.76%)	7
11.	HTN+CGN	4(2.56%)	1(1.92%)	5
12.	HTN+CGN+CIN	3(1.92%)	0	3
13.	HTN+DM+CGN	3(1.92%)	0	3
14.	DM+NSAID abuse	1(0.64%)	1(1.92%)	2
15.	HTN+ Obesity	2(1.2%)	0	2
16.	NSAID abuse +CGN	1(0.64%)	0	1
17.	NSAID Abuse +CIN	0	1(1.92%)	1
18.	NSAID Abuse +HTN+CIN	0	1(1.92%)	1
19.	DM+CGN	1(0.64%)	0	1
20.	DM+ Obesity	1(0.64%)	0	1
21.	DM+CIN	1(0.64%)	0	1
22.	DM+HTN+ Obesity	1(0.64%)	0	1
23.	DM+HTN+ NSAID+ CIN	1(0.64%)	0	1

Single Disease

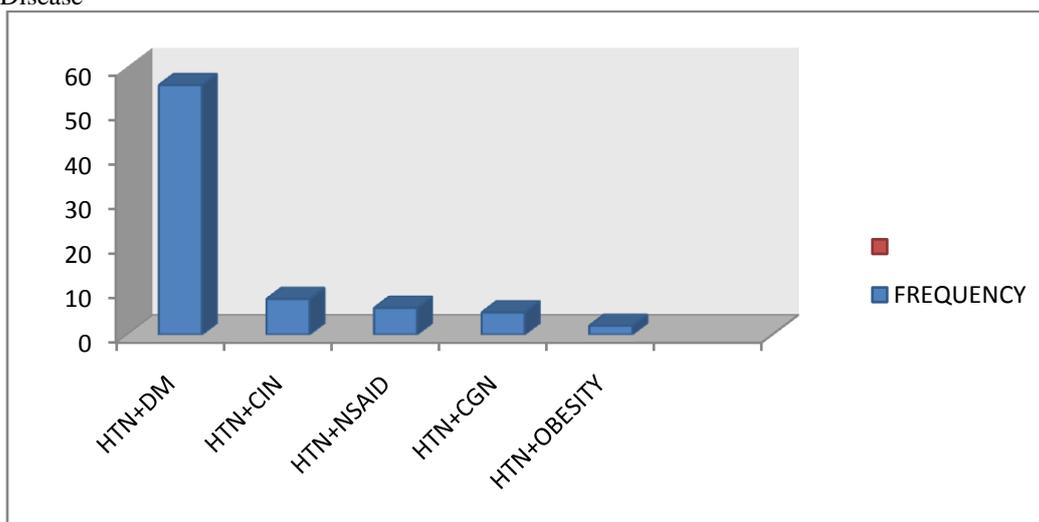


Fig. no. 19 Distribution of Patients Diagnosis Based on Gender

Multiple Disease

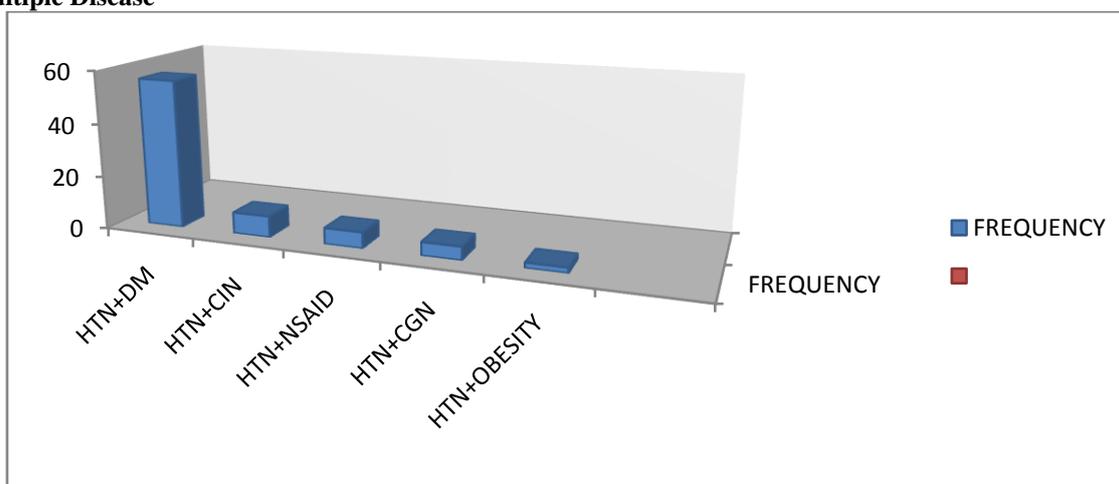


Fig. no. 20. Distribution of Patients Diagnosis Based on Gender

Distribution of patients diagnosis based on age frequency:

Among 208 patients the distribution of patients diagnosis based on age shows that the majority of patients were 41-50 yrs with hypertension was 28(13.46%) and 51-60yrs HTN+DM was 23(11.05%) respectively shown in table. The significant difference of diagnosis on age was found. (P < 0.03).

Table.5 DISTRIBUTION OF PATIENTS DIAGNOSIS BASED ON FREQUENCY

S.No	Diagnosis	<30	31-40	41-50	51-60	61-70	>71
1.	Hypertension	6	13	28	8	8	3
2.	Diabetic Mellitus	1	1	9	4	-	4
3.	NSAID abuse	4	1	1	-	-	1
4.	Contrast Interstitial Nephritis	2	1	1	3	-	-
5.	Obesity	-	1	2	-	1	-
6.	Chronic Glomerular Nephritis	1	2	-	-	1	-
7.	HTN+DM	3	3	15	23	5	7
8.	HTN+DM+NSAID abuse	-	-	5	1	3	-
9.	HTN+CIN	1	4	3	-	1	-
10.	HTN+NSAID abuse	-	-	3	2	2	-
11.	HTN+CGN	2	1	2	-	-	-
12.	HTN+CGN+CIN	-	1	2	-	-	-
13.	HTN+DM+CGN	-	-	-	3	-	-
14.	DM+NSAID abuse	-	-	1	-	-	-

15.	HTN+ Obesity	1	2	-	-	-	-
16.	NSAID abuse +CGN	-	-	-	1	-	-
17.	NSAID Abuse +CIN	-	-	-	-	1	-
18.	NSAID Abuse+HTN+CIN	1	-	-	-	-	-
19.	DM+CGN	-	1	-	-	-	-
20.	HTN+ Obesity	1	2	-	-	-	-
21.	DM+CIN	-	1	-	-	-	-
22.	DM+HTN+ Obesity	-	-	2	-	-	-
23.	DM+HTN+ NSAID+ CIN	-	-	-	-	1	-

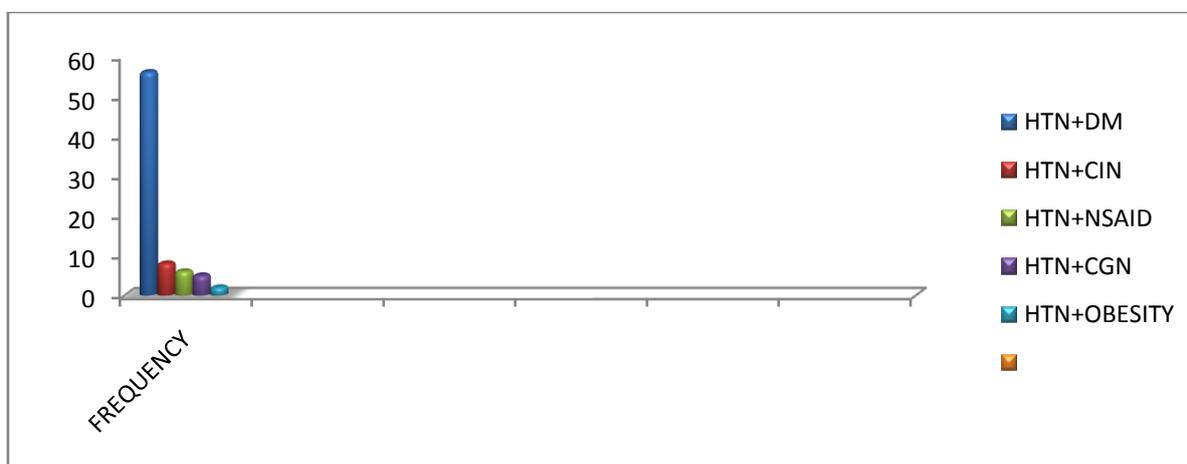


Fig. no. 21 distribution of patients diagnosis based on age frequency

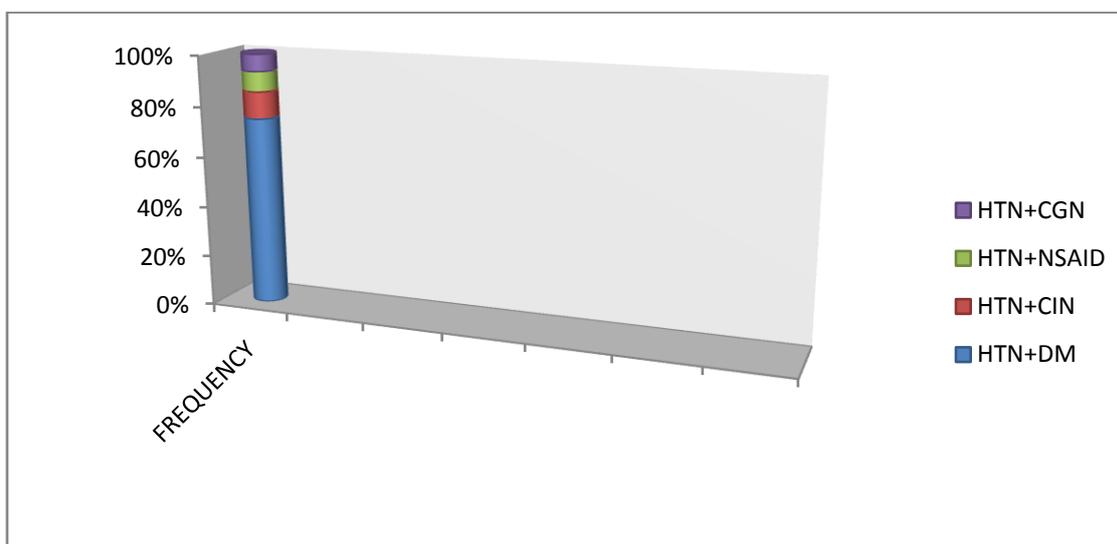


Fig. no. 22 distribution of patients diagnosis based on age frequency

Distribution of patient diagnosis based on haemodialysis:

Among 208 cases the majority of the patients with haemodialysis of hypertension was about 66(31.73%), HTN+DM was 55(26.44%) Diabetic Mellitus 19(9.13%) DM+HTN+NSAID abuse was about 9(4.32%) .

Table: 6 DISTRIBUTION OF PATIENT DIAGNOSIS BASED ON HAEMODIALYSIS

S.NO	Diagnosis	Haemodialysis
1.	Hypertension	66(31.73%)
2.	HTN+DM	55(26.44%)
3.	Diabetic mellitus	19(9.13%)
4.	DM+HTN+NSAID abuse	9(4.32%)

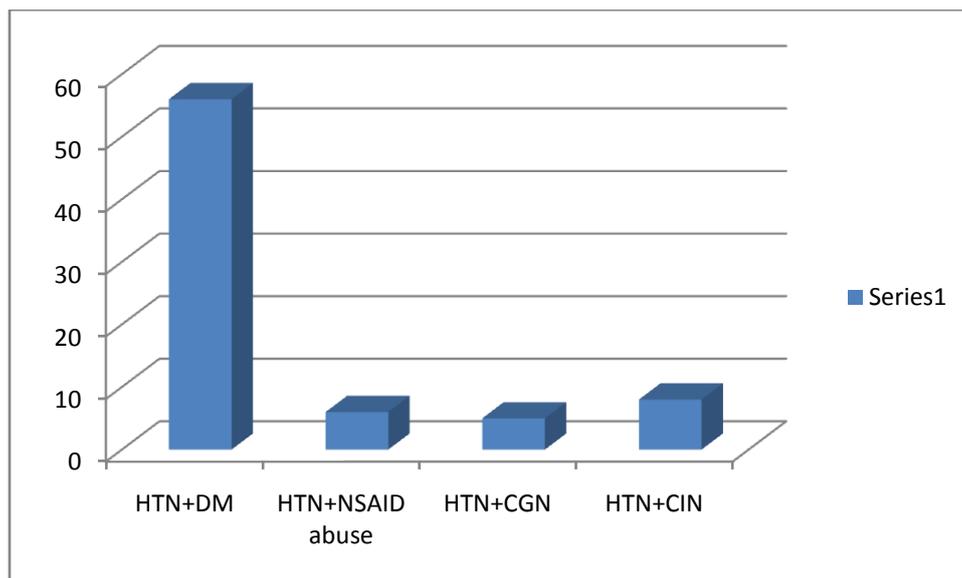


Fig. No.23 Distribution Of Patients Diagnosis Based On HD

Total number of risk factors:

Among 208 patients majority of the risk factors were hypertension 63(59.43%), diabetes mellitus 20(18.96%), analgesic abuse 8(7.54%), chronic glomerular nephritis 4(3.77%), chronic interstitial nephritis 7(6.60%) obesity 4(3.77%)

TABLE NO.7 TOTAL NO.OF RISK FACTORS

S.no	Risk factors	frequency	percentage
1	Hypertension	63	59.43 %
2	Diabetes mellitus	20	18.96 %
3	Analgesic abuse	8	6.60 %
4	Chronic- Glomerulonephritis	4	3.77 %
5	Chronic-interstitial nephritis	7	6.60 %
6	Obesity	4	3.77 %

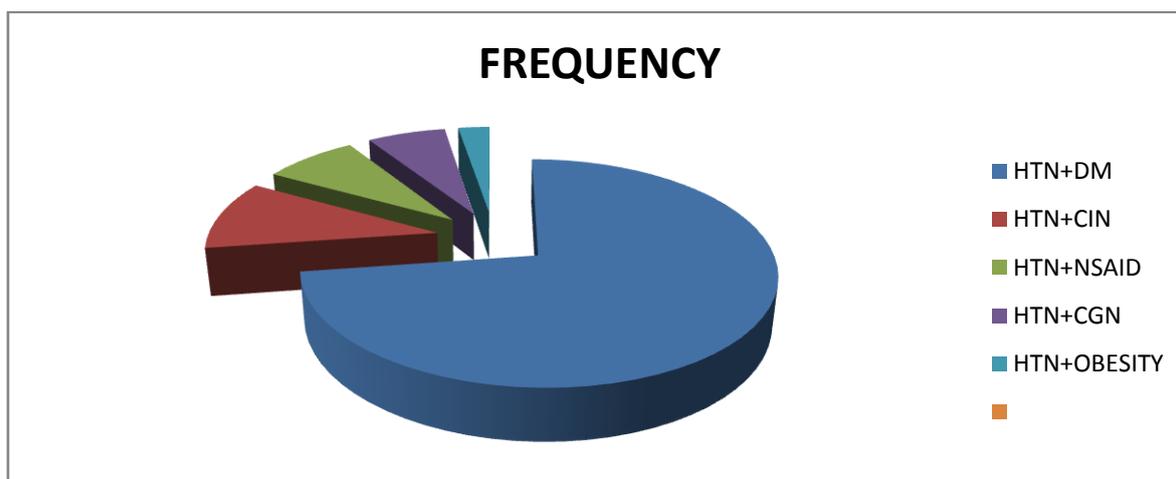


Fig. No.24 Total No. Of Risk Factors

Patients having two or more risk factors:

Among 208 patients the majority of the patients having two or more risk factors HTN+DM 56(73%) HTN+NSAID abuse 6(8%) HTN+CGN 5(6%) HTN+CIN 8(10%) HTN+ Obesity 2(3%)

TABLE NO.8 PATIENTS HAVING TWO OR MORE RISK FACTORS

S.No	Patients with two or more RF	Frequency	Percentage
1	HTN with DM	56	73 %
2	HTN with Analgesic abuse	6	8 %
3	HTN with CGN	5	6 %

4	HTN with CIN	8	10 %
5	HTN with Obesity	2	3 %

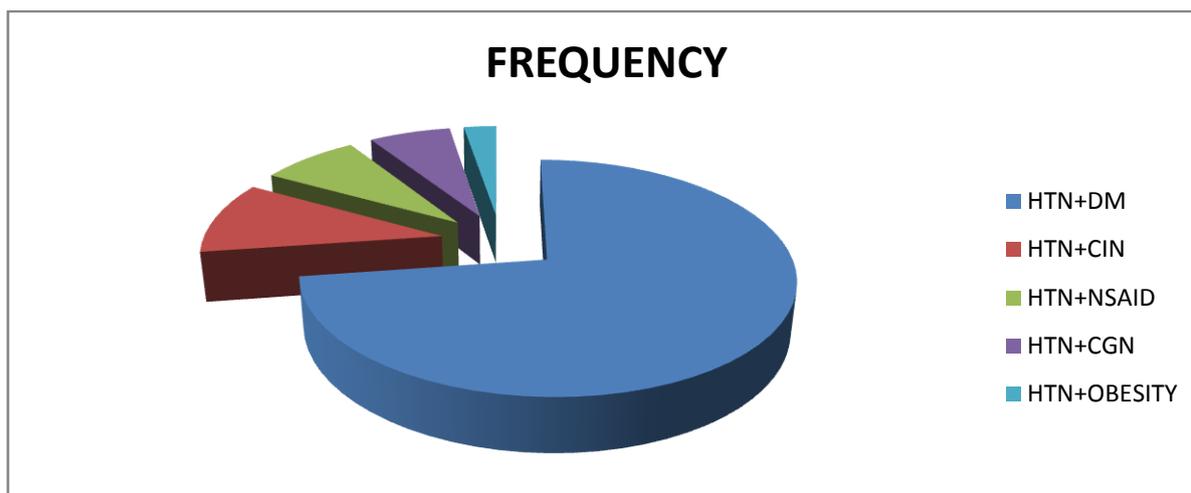


Fig. No. 25 Patients Having Two Or More Risk Factors

IV. Discussion

Our prospective observational study was carried out among 208 patients in Nephrology inpatients department shows that the majority of type of hypertension occurring in male patients is 49(31.41%) females 17 (32.69%). The reason is because of the high blood pressure due to the smoking and alcohol consumption and polypharmacy respectively.

In our current study, age distribution represents the majority of patients attended to the nephrology inpatients department were under the age of 41-50 of male 55(35.94%) female 18(32.7%), followed by 51-60 of male 36(23.52%) and female 9(16.3%) were prone to develop the types of hypertension and diabetes.

Our study conducted among 208 patients shows majority of type of hypertension with diabetes is about 56 (26.92%).

In our study the drugs used in the management of hypertension are anti hypertensive agents such as calcium channel blockers Amlodipine and diuretics Furosemide, and alkalizing agents such as sodium bicarbonate.

In the current study, the most commonly occurred symptoms are rise in BP, Pedal edema, decreased Urine output, Facial puffiness, Fever, Loin pain, Shortness of breath, Burning micturition, Abdominal distension and pain.

The chronic kidney disease in patients is diagnosed by the levels of glomerular filtration rate (GFR). Among the study conducted between 208 patients, the range of GFR between 5-10ml/mim/1.73m² is male 76(44.97%) and female is 5(12.82%) and GFR between 11- 15ml/min/1.73m² is male 93(55.02%) and female 34(87.14%).

In this present study, majority of the patients with hypertension under the age group of 41-50 is 28(13.46%) ,diabetes with hypertension 51-60 is 23(11.05%) and 41-50 is 15(7.25%) and 31-40 is 13 (6.25%).

In our study, patient's diagnosis based on hemodialysis are hypertension is 66(31.73%), hypertension with diabetes 55(26.44%), diabetes 19(9.13%), diabetes with hypertension, analgesic abuse is 9(4.32%). Majority of risk factors are hypertension 63(32.28%), diabetes 20 (9.61%), analgesic abuse 8(3.84%).

Statistical data is analyzed for the outcome of age group, diagnosis, gender and also glomerular filtration rate (GFR) by using Prism software. Data includes that there is no significance difference of age group on gender.

V. Conclusion

The study was carried out in an attempt to find out the risk factors for the progression of CKD at government hospital. The study showed an active involvement of clinical pharmacists in nephrology department.

Most of the patients attending the nephrology department with risk factors such as hypertension were under the age of forty one to fifty. We studied the risk factors in inpatient. The incidence of the renal disorders is mostly seen in hypertensive condition.

In our study, we observed the mostly occurring type of renal disorders on the basis of age, gender and the GFR levels in CKD patients. Majority of risk factors are hypertension, hypertension with diabetes, diabetes and analgesic abuse.

The most commonly occurred symptoms are rise in BP, pedal edema, decreased urine output, facial puffiness, fever loin pain, shortness of breath, burning micturition ,abdominal distension and pain.

In our study ,majority of the patients were found for the progression of CKD were hypertension, hypertension with diabetes and diabetes respectively.

A prospective observational study was carried out and it concludes that the risk factors for the progression of CKD study conducted on the renal disorders inpatients is hypertension, and the treatment provided to the patients were satisfactory.

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