Evaluation of Risk factors for the Prevalence of Kidney Failure (CKD & AKD) and The Impact of Clinical Pharmacists Role in Improving the Medication Adherence in Kidney Disease Patients of A Tertiary Care Teaching Hospital

R.Manogna Gayatri¹, M.Ujwala², A.S.Madhuri², Uma Sankar Viriti³.
¹Department of Pharmacy Practice, Avanthi institute of Pharmaceutical Sciences Cherukupally, Bhogapuram.
²Department of Pharmacy Practice, Avanthi institute of Pharmaceutical Sciences Cherukupally, Bhogapuram.
³Associate Professor, Department of Pharmacy Practice, Avanthi institute of Pharmaceutical Sciences Cherukupally, Bhogapuram.

ABSTRACT

Aim: The aim of the study is to evaluate the risk factors for the prevalence of kidney failure (CKD & AKD) and to analyse the role of clinical pharmacist in improving the medication adherence. Methodology: A prospective intervention, analytical study was done on patients admitted in Maharaja Institute Of Medical Sciences Vizianagaram, AP, India. Information regarding the renal disease stages of CKD, age, gender, causative factors, serum creatinine, dialysis, medication adherence, reasons for non medication adherence, were recorded in standard questionnaire (Case Report Form).

Results: Total 220 patients were included in this study, out of them 158(71.8%) patients were diagnosed with CKD & 62 (28.1%) patients were diagnosed with AKD. Renal disease is high in male patients (63.1%) than in female patients (36.8%). Non medication adherence reasons and pharmacist counselling about medication adherence are the modifiable risk factors and got significant values in student T test (p value 0.0326 & 0.0478) using SPSS Software.

Conclusion: Hypertension Is The Major Riskfactor For Developing of Kidney Failure. More Patients Are Prone To Ckd When Compared To Akd. Kidney Failure Is Mostly Observed In Men Than In Women And They Are Mostly Diagnosed With Ckd Stage 5. Lack Of Symptoms Is The Primary Factor For Non-Medication Adherence Among People. As There Is A Clear Evidence Seen Based On Data Obtained After Performing Patient Counselling And Patient Education. We Conclude Clinical Pharmacists Could Play A Vital Role In Improving The Medication Adherence Among Ckd & Akd Patients Which Wil Ultimately Make The Patients Free From Ckd & Akd.

Key words: Chronic Kidney Failure, Acute Kidney Failure, Case Report Form, Diagnosis

INTRODUCTION

ACUTE KIDNEY DISEASE

DEFINITION

Acute kidney injury (AKI), previously called acute renal failure (ARF) is an abrupt loss of kidney function that develops within 7 days.

SIGNS AND SYMPTOMS

Fatigue loss of appetite, headache, nausea and vomiting, abnormal heart rhythms, fluid imbalance, dehydration.

ETIOLOGY

AKI can be caused by systemic disease such as a manifestation of an autoimmune disease, e.g. lupus nephritis, crush injury, contrast agents, some antibiotics, and more. AKI often occurs due to multiple processes. The most common cause is dehydration and sepsis combined with nephrotoxic drugs, especially following surgery or contrast agents.

DIAGNOSIS

Introduced by the KDIGO in 2012, specific criteria exist for the diagnosis of AKI. AKI can be diagnosed if any one of the following is present: Increase in Scr by ≥0.3 mg/dl (≥26.5 μmol/l) within 48 hours; or Increase in Scr to ≥1.5 times baseline, which has occurred within the prior 7 days; or Urine volume < 0.5 ml/kg/h for 6 hours.

TREATMENT

1. Diuretics, Loop
2. Inotropic Agents
3. Vasodilators
4. Calcium Channel Blockers
5. Antidotes And

DIALYSIS

Dialysis is the process of removing excess water, solutes and toxins from blood in people whose kidneys can no longer perform these functions naturally. This is referred to as renal replacement therapy.

TYPES OF DIALYSIS

1. Heamo dialysis
2. Peritoneal dialysis
3. Heamo filtration
4. Hemodiafiltration
5. Intestinal dialysis
AIM AND OBJECTIVES

AIM
The aim of the study is to evaluate the risk factors for the prevalence of kidney disease and to analyse the role of the clinical pharmacist in improving the medication adherence.

OBJECTIVES
- To enlist and report the adverse drug reactions during the therapy.
- To re-emphasize the crucial role of the drug adherence in renal impairment patients.
- To identify the incidence of renal impairment in hypertension and diabetic patients.
- To observe dialysis complications.
- To observe the drug interactions in prescribed drugs.
- To evaluate the reasons for non-medication adherence.
- To counsel and evaluate the patients regarding the importance of complete medication adherence.
- To evaluate the role of clinical pharmacists in improving the medication adherence in renal failure patients.

METHODOLOGY

STUDY SITE
The study was conducted at nephrology department of MIMS hospital.

STUDY DESIGN
The investigation was a intervention study, approved by hospital ethical committee.

STUDY DURATION
The study was conducted for a period of 6 months from July 2018 to December 2018.

SELECTION CRITERIA

INCLUSION
1. CKD patients of all stages.
2. AKI Patients.
3. Drug induced both CKD & AKI.
4. Patients undergoing dialysis.
5. Patients with all age groups of either sex.
6. Patients willing to participate in the study.
7. CKD Patients with diabetes mellitus, hypertension.

EXCLUSION
1. Urinary track obstruction patients.
2. Renal artery stenosis & rapid progressive glomerulonephritis.
3. Patients not willing to participate in the study.
4. Pregnant women with renal impairment.

STUDY PROCEDURE
After obtaining the approval from the ethical committee and from the department of Nephrology, the study was initiated at medicine department by selecting the patient based on inclusion and exclusion criteria of the study. A total number of 220 patients are included in our study. We have collected the patients information with the help of case profile form and questionnaire form. We evaluated about the etiological factor for the development of CKD & AKD, Preference in type of dialysis and complications of dialysis, range of serum creatinine, medication adherence and reasons for non-medication adherence and improving the medication adherence in renal impairment patients. Drug interactions in the prescribed drugs and physician acceptance for the drug interaction cases.

RESULTS

1. RENAL DISEASE
Out of total 220 patients, 158 (71.8%) patients were diagnosed with CKD and 62 (28.1%) patients were diagnosed with AKD.

Tab 1: Number of patients with CKD and AKD.

| RENAL DISEASE | NO. OF PATIENTS | PERCENTAGE (%) |
|---------------|----------------|----------------|
| CKD           | 158            | 71.8%          |
| AKD           | 62             | 28.2%          |

Graph 1: CKD and AKD Patients Percentage.

2. STAGES OF CKD
To interpret the state of disease condition, stage of CKD is necessary. The number of patients who are with CKD stage 1 are 22 (13.4%), stage 2 are 4 (2.5%), stage 3 are 20 (12.6%), stage 4 are 11 (6.9%) and stage 5 are 101 (63.9%).

Tab 2: Number of patients in categorized CKD stages and the percentage under each category.

| STAGES OF CKD | NO. OF PATIENTS | PERCENTAGE (%) |
|---------------|----------------|----------------|
| Stage 1       | 22             | 13.97%         |
| Stage 2       | 04             | 2.50%          |
| Stage 3       | 20             | 12.73%         |
| Stage 4       | 11             | 6.90%          |
| Stage 5       | 101            | 63.90%         |
3. AGE
The age groups included in our study were from <20 to 60 years. Patients in the age group of <20 years were found to be 2.72%. Patients in the age group of 21-40 years were found to be 20%, Patients in the age group of 41-60 years were found to be 60%, Patients in the age group of >60 years were found to be 17.29%.

**Tab 3**: Age group representing number of patients and its percentage.

| AGE         | NO. OF PATIENTS | PERCENTAGE(%) |
|-------------|-----------------|---------------|
| < 20 years  | 06              | 2.72%         |
| 21-40 years | 44              | 20%           |
| 41-60 years | 132             | 60%           |
| >60 years   | 38              | 17.28%        |

Graph 3: Age group vs number of patients and its percentage.

4. GENDER:
Out of the total 220 patients, 139 (63.1%) patients were male and 81 (36.8%) patients were female. More prevalence in male patients.

**Tab 4**: Gender representing the number of patients and its percentage.

| GENDER | NO. OF PATIENTS | PERCENTAGE(%) |
|--------|-----------------|---------------|
| Male   | 139             | 63.20%        |
| Female | 81              | 36.80%        |

Graph 4: Gender of male vs female patients.

5. CAUSATIVE FACTORS
Among all patients, only smokers were found to be 11.3%. Among all patients, only alcoholics were found to be 6%. Among all patients, both smokers and alcoholics were found to be 25.9%. Among all patients, hypertension was found to be 44%. Among all patients, diabetes were found to be 5%. Among all patients, both hypertension and diabetes were found to be 29%. Among all patients, drug-induced were found to be 24%.

**Tab 5**: Causative factors with patients and its percentage.

| CAUSATIVE FACTORS | NO. OF PATIENTS | PERCENTAGE(%) |
|-------------------|-----------------|---------------|
| Hypertension      | 97              | 44%           |
| Diabetes          | 11              | 05%           |
| HTN & DM          | 64              | 29%           |
| Smoking           | 25              | 11.3%         |
| Alcohol           | 13              | 6.0%          |
| Smoking & alcohol | 57              | 25.9%         |
| NSAIDS            | 53              | 24%           |
6. SERUM CREATININE
Serum creatinine value of patients ranging from 0.6-1.4 were found to be 2.7%. Serum creatinine value of patients ranging from 1.5-4 were found to be 21.81%. Serum creatine value of patients ranging from 4.1-6 were found to be 15.90%. Serum creatine value of patients ranging from 6.1-10 were found to be 30.9%. Serum creatine value of patients ranging from >10 were found to be 28.63%.

Tab 6: Serum creatinine level in number of patients and its percentage.

| SERUM CREATININE | NO. OF PATIENTS | PERCENTAGE(%) |
|------------------|----------------|---------------|
| 0.6-1.4          | 6              | 2.7%          |
| 1.5-4.0          | 48             | 21.87%        |
| 4.1-6.0          | 35             | 15.90%        |
| 6.1-10           | 68             | 30.90%        |
| >10              | 63             | 28.63%        |

7. DIALYSIS
The number of patients undergoing dialysis were 154 (70%) patients and 66 (30%) patients were not undergone any kind of dialysis.

Tab 7: Number of patients who underwent dialysis and non-dialysed and its percentage.

| DIALYSIS | NO. OF PATIENTS | PERCENTAGE(%) |
|----------|----------------|---------------|
| Yes      | 154            | 78.60%        |
| No       | 66             | 21.40%        |

8. TYPE OF DIALYSIS
The hemodialysis patients are 151 (98%) and peritoneal dialysis patients are 3 (1.9%).

Tab 8: Number of CKD patients who underwent hemo and peritoneal dialysis and its percentage.

| TYPE OF DIALYSIS | NO. OF PATIENTS | PERCENTAGE(%) |
|------------------|----------------|---------------|
| Heamodialysis    | 151            | 98.10%        |
| Peritoneal dialysis | 03          | 1.9%          |

Graph 5: Causative factors and its percentage.

Graph 6: Serum creatinine levels and its percentage.

Graph 7: Percentage of dialysed vs non-dialysed patients in the study.

Graph 8: The percentage of heamo dialysis vs peritoneal dialysis patients.
9. MEDICATION ADHERENCE VS NON MEDICATION ADHERENCE

Among 220 patients, 47 (21.3%) patients were found to be adhered to medication and 173(78.6%) were not adhered to medication.

Tab 9: Patients with medication adherence and non-medication adherence.

| MEDICATION ADHERENCE | NO OF PATIENTS | PERCENTAGE(%) |
|----------------------|----------------|---------------|
| Yes                  | 47             | 21.40%        |
| No                   | 173            | 78.6%         |

Graph 9: Percentage of patients with medication adherence and not medication adherence.

10. REASONS FOR NON-MEDICATION ADHERENCE

Among 220 patients, 173 patients were not adhered to the medications. The reasons for non-medication adherence in those patients are due to lack of symptoms 83 (47.9%), poly pharmacy 46 (26.5%), mistrust of doctors 29 (16.7%), misunderstanding of medications 09 (5.2%), time taken to see result 06 (3.4%).

Tab 10: Reasons for non medication adherence in patients and its percentage.

| REASONS                        | NO. OF PATIENTS | PERCENTAGE(%) |
|--------------------------------|-----------------|---------------|
| Lack of symptoms               | 83              | 47.90%        |
| Poly pharmacy                  | 46              | 26.50%        |
| Mistrust of doctors            | 29              | 16.70%        |
| Misunderstanding of medications| 09              | 5.20%         |
| Time taken to see result       | 06              | 3.70%         |

Graph 10: Reasons for non medication adherence and its percentage.

11. MEDICATION ADHERENCE

Initially we have interacted with the patients and explained about our work and received INFORMED CONSENT FORM (ICF) from all the patients.

BASELINE

Before counseling, out of 220 patients, 94 were found to be adhered to low medication, 79 were found to be adhered to medium medication and 47 were found to be adhered to high medication adherence.

Tab 11: Medication adherence before counseling.

| MEDICATION ADHERENCE | 94 | 79 | 47 |
|----------------------|----|----|----|
| LOW MEDICATION ADHERENCE | MEDIUM MEDICATION ADHERENCE | HIGH MEDICATION ADHERENCE |

Graph 11: Medication adherence of patients.

FOLLOW UP I

During first follow up, 83 were found to be adhered for low medication, 74 were found to be adhered for medium medication and 63 were found to be adhered for high medication.
Tab 12: Medication adherence after first counseling.

| LOW MEDICATION ADHERENCE | MEDIUM MEDICATION ADHERENCE | HIGH MEDICATION ADHERENCE |
|--------------------------|------------------------------|---------------------------|
| 83                       | 74                           | 63                        |

FOLLOW UP II:
During second follow up, 71 were found to be adhered for low medication, 68 were found to be adhered for medium medication, and 81 were found to be adhered for high medication.

Tab 14: Medication adherence during second follow up.

| LOW MEDICATION ADHERENCE | MEDIUM MEDICATION ADHERENCE | HIGH MEDICATION ADHERENCE |
|--------------------------|------------------------------|---------------------------|
| 71                       | 68                           | 81                        |

Graph 14: Medication adherence during second follow up.

FOLLOW UP III
During third follow up, 49 were found to adhered to low medication, 57 were found to be adhered to medium medication, and 114 were found to be adhered to high medication.

Tab 15: Medication adherence during third follow up.

| LOW MEDICATION ADHERENCE | MEDIUM MEDICATION ADHERENCE | HIGH MEDICATION ADHERENCE |
|--------------------------|------------------------------|---------------------------|
| 49                       | 57                           | 114                       |

Graph 15: Medication adherence during third follow up.

Initially we have interacted with patients and explained about our work and received ICF from all the patients. During the first interaction session all the details related to medication adherence of the patients were noted by using a structured questionnaire. Then counseled the patients regarding the importance of medication adherence and severity of the disease. During the second visit, the first follow up was done and gathered information related to medication adherence and counseled the patients who were still exhibited poor medication. The same process were repeated for 3rd and 4th visits and the results were drawn and analysed.

Graph 16:
LMA—Low medication adherence
MMA—Medium medication adherence
HMA—High medication adherence.

Non medication adherence reasons and pharmacist counselling about medication adherence are the modifiable risk factors and got significant values (p value ≤ 0.05) in student T test (p value 0.0326 & 0.0478) using SPSS Software.

CONCLUSION
Hypertension is the major risk factor for developing of kidney failure. More patients are prone to CKD when compared to AKD. Kidney failure is mostly observed in men than in women and they are mostly diagnosed with CKD stage 5 lack of...
symptoms is the primary factor for non-medication adherence among people. As there is a clear evidence seen based on data obtained after performing patient counselling and patient education, we conclude clinical pharmacists could play a vital role in improving the medication adherence among CKD & AKD patients which will ultimately make the patients free from CKD & AKD.

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