Research Article

A study on Prescription Pattern of Oral Hypoglycemic agents and Insulin Therapy in Chronic Renal Failure Patients and Assessment of Medication Adherence

Varsha Padman*, Dr. Yogananda R, Dr. Bharathi DR, Neethu Joseph, Dr. Sandeep GN
Department of Pharmacy Practice, SJM College of Pharmacy, Chitradurga, India.
Basaveshwara Medical College Hospital and Research Centre, Chitradurga, India.
Suneetha kidney Care and Dialysis Centre, Chitradurga, India.
*Corresponding author's E-mail: vachupadman11@gmail.com

ABSTRACT

Diabetes mellitus (DM) is recognized as a leading cause of chronic kidney disease (CKD).End stage renal disease (ESRD) and dialysis add to the complexity of glycemic management in this population .The present study aims at management of diabetes in CKD patients. The objective is to assess the prescription pattern of oral hypoglycemic agents and insulin therapy and also to assess the medication adherence of chronic renal failure patients to hypoglycemic agents. This was a Prospective Observational study, was carried out for a period of six months at Medicine department of Basaveshwara Medical College & Hospital, Chitradurga and in Suneetha kidney Care and Dialysis Centre, Chitradurga, karnataka. A total of 107 patients in which 77 were males and 30 were females. .Commonly prescribed anti-diabetic agent was insulin (49.5%), followed by combination of insulin and sulphonylureas (25.2%). Low medication adherence has been noticed in most of the patients which was improved after patient counseling during next follow up by using Morisky Medication Adherence Scale (MMAS). MMAS results showed the P value at the first visit medication adherence was poor, and shows significant change in follow up was 0.000.The study concludes that Antidiabetic regimens such as sulphonyl ureas and insulin therapy, were found to have a significant association with glycemic control and also pharmacist provided patient education found to have significant influence on advancement in the patient's knowledge towards medication and their disease and which shows positive impact on adherence to prescribed therapy.

Keywords: CKD, Diabetes, Insulin, Adherence

INTRODUCTION

Diabetic kidney disease (DKD) is the leading cause of ESRD. Albuminuria is recognized as the most important prognostic factor for CKD progression.[1] Poorly controlled glycemia in patients with DM is a risk factor for the development and progression of kidney disease, while diabetes itself is responsible for a large proportion of cases of ESRD and premature death in dialysis patients.[2] Glycemic control is essential to delay or prevent the onset of DKD. There are a number of glucose-lowering medications available but only a fraction of them can be used safely in CKD and many of them need an adjustment in dosing. Diabetes control should be optimized for each individual patient, which measures to reduce diabetes-related complications and minimize adverse events. Management of DM includes many areas may be influenced by the severity of the patient kidney dysfunction.[3] Blood sugar control in those with CKD adds another level of complexity. It includes detailed knowledge in which how the medications can be safely used and how kidney disease affects metabolism of these medications. In kidney disease, the glycemic target needs to be individualized for each patient, acknowledging.[4] Adherence to treatment plays a major role, whereas non-adherence to prescribed drugs significantly increases morbidity and mortality in developing countries.[5]

So the present study is taken for assessing the prescription pattern of oral hypoglycemics, insulin therapy and also to assess the medication adherence in CKD patients. This helps in better controlling of diabetes, preventing the progression of CKD and diabetic complications and hence improves the quality of life of the CKD patients.

MATERIALS AND METHODS

The study was approved by the Institutional Ethical Committee, of SJM College of pharmacy, chitradurga, Karnataka. The study was carried out at General Medicine department in Basaveshwara Medical College Hospital & Research Centre, Chitradurga and Suneetha kidney Care and Dialysis centre Chitradurga. All CKD patients with DM who were presented to the Medicine in-patient and out-patient department of the hospital and dialysis centre were enrolled in the study. It was a prospective observational type of study initiated from October-March 2016 in which patients receiving treatment for DM with CKD were included in the study. The inclusion criteria were patients diagnosed as chronic renal failure with diabetes and renal failure patients undergoing dialysis. The exclusion criteria were, patients who were diagnosed as acute renal failure and patients diagnosed as chronic renal failure without diabetes. Demographic data was obtained from all the patients.

A total of 107 patients were enrolled in to the study on their visit to the hospital and dialysis centre were reviewed daily. CKD patients with DM were identified and

collected their demographic details, medical and medication history, clinical data such as diagnosis, clinical condition; therapeutic data such as name of the drug, dose, route, frequency and other relevant details by reviewing their prescriptions, medical records and by interviewing the patients and/or care givers. Obtained patient information was documented in a suitably designed individual case record form. The patients were interviewed and their socio-demographic details are entered in the patient data collection forms along with complications and therapy.

Patient counseling

At the outpatient department of medicine and in dialysis centre counseling was performed in a separate chamber to ensure privacy. Counseling session designed so that all patients were counseled according to their individual understanding and attitude towards their disease and medication. Pharmacist explained about their disease, medication and also validated questionnaire was given to the patient at interview and assessed their adherence on medication. In order to know the Medication Adherence provided with specially designed questionnaire i.e., Morisky Medication Adherence scale.

Statistical analysis

Using the Statistical Package for Social Service (SPSS) 16 version, the results were calculated and analyzed by Non parametric Wilcoxon signed rank test. A p value less than 0.05 were considered as statistically significant.

RESULTS AND DISCUSSION

Distribution of Patients According to Age

A total of 107 patients data were collected from Basaveshwara Medical College Hospital and dialysis

centre department in which inpatients and outpatients were included. The majority of the participants were between 60-69 years old (34.6%), followed by age group 50-59(21.5%). mum age was 30.The mean age of the study population was between 59.13±13.00. The maximum age of study was found to be 85 and minimum age was 30.The mean age of the study population was between 59.13±13.00.
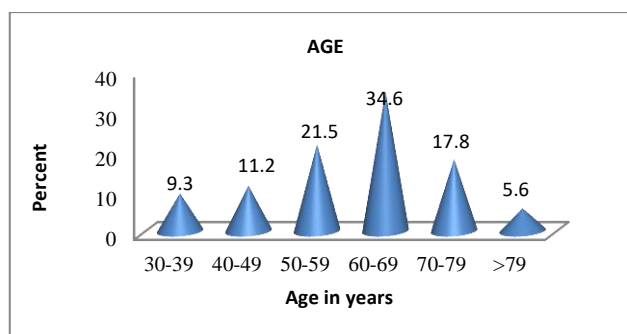

Figure 1: Distribution of Patients According to Age

Prescription Pattern of Anti-Diabetic Agents

Insulin is the first choice of treatment for chronic renal failure and also dialysed patients. In the total of 107 patients, 53 were on insulin treatment (50%) followed by combination with insulin and sulphonylureas 27 (25%). The least prescribed combination was insulin+sulphonylureas+alpha-glycosidase inhibitors (1%).

Pattern of Insulin

The most commonly prescribed insulin in this study population was found to be rapid+long acting insulin(43%) followed by rapid acting(31%). Least prescribed was long acting insulin (1%). In the whole 16 patients were not under insulin therapy.

Table 2: Prescription Pattern of Anti-Diabetic Agent

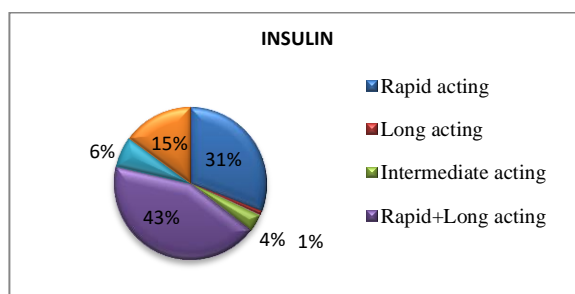| Drug Therapy	Frequency	Percent
Insulin	53	49.5
Insulin, Alpha-glycosidase inhibitors(AGI)	5	4.7
Insulin, Meglitinides	5	4.7
Insulin, Sulfonylureas	27	25.2
Insulin, Sulfonylureas, AGI	1	0.9
Sulfonylureas	16	15.0
Total	107	100.0

Figure 3: Pattern of Insulin

Pattern of Suphonyl Ureas

Most frequently used sulphonylurea was Glimipride 20(18.7%) followed by Glipizide 12(11.2 %).

Assessment of Treatment Pattern

Most of the CKD patients with DM were treated with Monotherapy. In the present study population combination therapy were used only for 35.5% compared with mono therapy 64.5%.
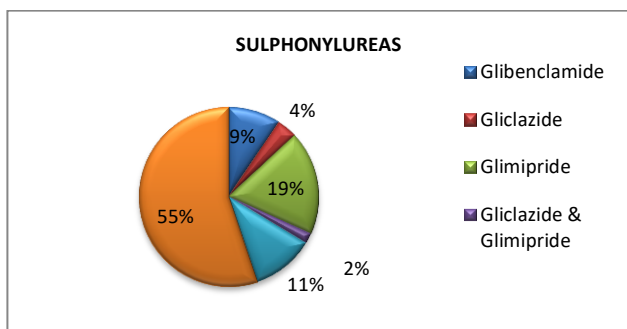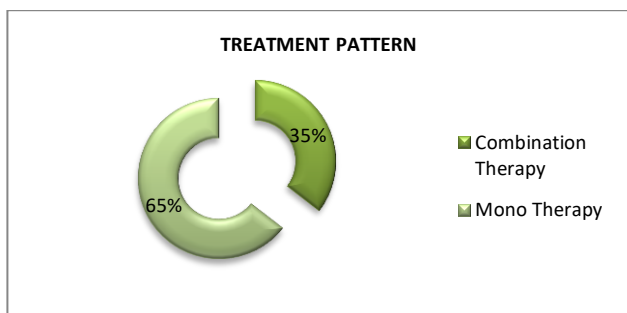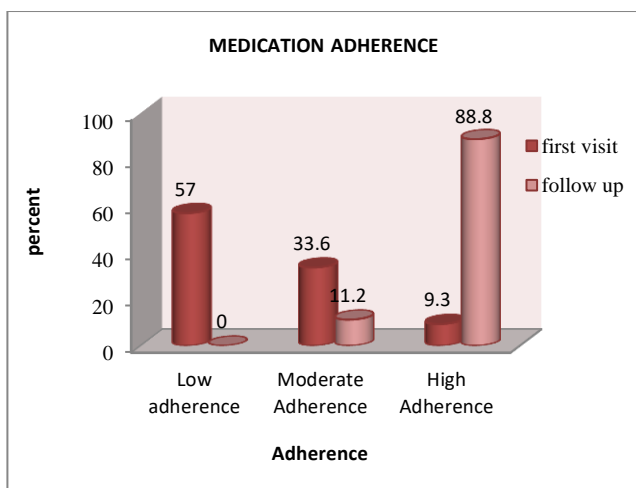
Figure 4: Pattern of Suphonyl Ureas

Figure 5: Assessment of Treatment Pattern

Assessment of Medication Adherence

The medication adherence of the participants were assessed using Morisky medication adherence Scale 8 on the first visit and follow up and compared.

Z=-8.7   p=0.000

Figure 6: Assessment of Medication Adherence

Non parametric test, Wilcoxon signed ranks test were used to compare first visit & follow up. P value=0.000. There is a significant difference between first visit & follow up at 5% level of significance.

DISCUSSION

In the present study i have enrolled 107 patients among which the males are more 77(72%) than the females 30 (28%). Janmohamed MN *et al.*, conducted a cross sectional study on Prevalence of chronic kidney disease in diabetic adult out-patients in Tanzania. Of the 369 study participants, 197 (53.4%) were female, and 258 (70.3%).

Males are more prevalent in CKD than females. Hence the study shows the male dominance.[6]

The present study most of the patients having CKD with DM is treated with insulin used (53%) followed by combination therapy insulin with sulphonylureas (27%). A similar study was conducted by Huri HZ *et al.*, conducted a retrospective, cross-sectional study on Glycemic Control and Antidiabetic Drugs in Type 2 Diabetes Mellitus Patients with Renal Complications. And they concluded that insulin (57.9%) was the most commonly prescribed antidiabetic medication, followed by sulfonylureas (43%).[7]

Terpening *C et al.*, conducted a study on maladaptive: Do We Avoid Metformin Unnecessarily And concluded that for metformin to contribute to lactic acidosis, one must assume that its use would increase circulating lactate levels. In Chronic renal impairment is metformin is listed as contraindicated because it is exclusively renally cleared. Therefore, impaired renal function should increase metformin levels, which might increase the risk of lactic acidosis. In my study no patient is prescribed with metformin due to lactic acidosis in CKD patients. Usually metformin is the most commonly prescribed drug in diabetes but it is contraindicated in renal failure.[8]

Burnier M *et al.*, conducted on Drug adherence in Chronic Kidney Diseases and Dialysis and concluded that because of the convolution of treatment and the polypharmacy, CKD patients are at very high risk of poor adherence and should definitively be supported in their efforts to maintain a good persistence. In my study, the medication adherence assessment was performed by Modified Morisky 8 item Medication Adherence Scale. P value more significant (0.000*) while comparing with the first visit. This clearly showed that there was a good improvement in medication adherence.[9]

1. CONCLUSION

Glycemic control is essential to delay or prevent the onset of diabetic kidney disease. In the present study it shows that most commonly prescribed anti-diabetic agent is insulin therapy followed by sulphonylureas. The kidneys metabolize most of the oral hypoglycaemic agents and they tend to accumulate during renal failure. This causes the risk of hypoglycaemia and toxicity. But insulin therapy having less toxicity and it is useful in protecting kidneys. The goal of the present review was to re-emphasize the crucial role of drug adherence in the management of CKD patients at any stage of the disease including on maintenance of hemodialysis. Poor adherence should be taken into consideration in all clinical situations in which targets are failed despite notable efforts to prescribe the adequate treatments. Because of the convolutions of treatment and the polypharmacy, CKD patients are at very high risk of poor adherence and should be supported in their attainment to maintain a good persistence. Physicians and all other healthcare professionals should be aware of the different strategies accessible to help their patients and should attach their efforts to attenuate

the barriers to good adherence by improving the communication, reducing the pill burden and if possible by monitoring drug adherence occasionally when there is suspicion of poor adherence.

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Source of Support: Nil, **Conflict of Interest:** None.