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THE STUDY ON RISK FACTORS, COMPLICATIONS AND MANAGEMENT ON DIABETES MELLITUS WITH CHRONIC KIDNEY DISEASE

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Abstract

Introduction: Diabetes mellitus (DM) is a chronic metabolic disorder characterized by elevated blood glucose level and associated with number of complications including acute metabolic and long-term vascular complications. Type 2 diabetes mellitus (T2DM) is the most common type of diabetes worldwide. Chronic kidney disease (CKD) in patients with T2DM is the major cause of end stage renal disease, characterized by proteinuria with a subsequent decline in glomerular filtration rate. Aim & Objectives: To evaluate the risk factors, complications and management of diabetes mellitus with chronic kidney disease. Methodology: A prospective observational study was conducted for 6months duration in Nephrology department. Based on the inclusion criteria and exclusion criteria the DKD patients were recruited in the study. We have obtained the informed consent forms from those who are willing to participate in the study. The data was collected from personal interviews (patient& / or patient representatives), professional interviews (doctors/nurses/technicians) by using a well structured patient data collection proforma and followed up. Results & Discussion: At the age above 50 yrs maximum high blood glucose and high BP patients were appeared in more number due to greater urbanisation, change in life styles and environmental factor. High cholesterol, obesity and diet are the major risk factors for DKD according to our observational studies. Diet shows a major impact on the diabetes when we eat extra calories and fat, our body creates an undesirable rise in blood glucose (hyperglycaemia), it may lead to serious problems that if persistent, may lead to long term complications, such as nerve, kidney and heart damage. Conclusion: The risk factors for DKD were assessed as age group, gender, obesity, high BP, high blood sugar, high cholesterol, illiteracy, urbanisation, life style modifications. Totally we concluded that most patients with DM will affect kidney that may prolong the renal failure. The CKD. As per our study we finally stated that there are different stages of DKD (stage 1,2,3,4 and 5). Most of the patients in DKD are observed in stage 2.

Keywords: Diabetes mellitus, CKD, Hyperglycaemia, Proteinuria, Diabetic complications.

INTRODUCTION

Diabetes is a disorder characterized by increase blood sugar due to defective insulin secretion, insulin action or both. It describes a group of metabolic diseases1-3.

TYPES OF DIABETES MELLITUS:

Type 1 DM:

- This type is an autoimmune disease.
- It means our body attacks itself. It also known as juvenile diabetes (or)insulin dependent diabetes mellitus.

Type 2 DM:

our body either doesn't make enough insulin or our body cells don't respond normally to the insulin. This is the most common type of diabetes.

GESTATIONAL DIABETES:

This type develops in women during a pregnancy without a previous history of diabetes.

Etiology:

- Genetic defects of beta cell function.
- Infections.
- Drugs.
- High blood pressure
- Obesity
- Age

- Stress
- Smoking

Symptoms of dm:

- Weight loss
- Polyuria
- Polydipsia
- Polyphagia

Risk factors:

- Family history
- Overweight
- Hypertension
- Low HDL cholesterol.
- High triglyceride level.
- Physically inactive
- Age more than 45
- Having polycystic ovarian syndrome
- History of cardiac disease

COMPLICATIONS OF DIABETES MELLITUS4-10:

- Cardiovascular disease
- nerve damage
- kidney damage
- eye damage
- foot damage

DIAGNOSIS OF DIABETES MELLITUS:

- Fasting Plasma Glucose Test.
- Random Plasma Glucose Test.
- A1cTEST.
- Oral Glucose Tolerance Test.

MANAGEMENT OF DIABETES MELLITUS

Non-pharmacological therapy:

- Exercising regularly.
- Losing weight.
- Take medication and insulin as prescribed.
- Monitoring our blood glucose and blood pressure levels
- Quiting smoking.

Pharmacological therapy11-18:

- Oral therapy: Sulfonyl ureas;
- First generation: Chlorpropamide
- Tolazamide Tolbutamide Acetohexamide
- Second generation:
- Glipizide
- Glimepride
- Glyburide
- Metformin
- Phenformin
- Thiazolidinediones
- Pioglitazone, Rosiglitazone
- Dipeptidylpeptidase 4-inhibitors
- Alogliptin, Linagliptin, Saxagliptin, Sitagliptin

Stages of CKD:

Staging of GFRI classified as:

Stage1–GFR>=90ml/min/1.73meterssquare[NORMALPRELEVATEDGFR].
Stage2–GFR60-89ml/min/1.73meterssquare[MILD]
Stage3–GFR30-59ml/min/1.73meterssquare[MODERATE]
Stage4–GFR15-29ml/min/1.73meterssquare[SEVERE]
Stage5–GFR<15ml/min/1.73meterssquare[KIDNEYFAILURE].

Causes of ckd:

- Diabetes
- Hypertension
- Obstructed urine flow
- Kidney disease
- Polycystic kidney disease

DIAGNOSTIC STUDIES OF CKD:

- Urine analysis.
- Urine culture.
- Hemo crittest.
- Renal functiontest.
- Angiography.

Management of CKD:

Nonpharmacological treatment

- Nutritional therapy.
- Proteinintake.
- Fluids
- Maintain food diet.
- Water and electrolyte balance.

Pharmacological treatment:

ACE inhibitors, AR blockers, Diuretics.

AIM:

To evaluate the risk factors, complications and management of diabetes mellitus with chronic kidney disease

OBJECTIVES:

- To assess the risk factors in diabetic patient with chronic kidney disease
- To study the complications or consequences of DKD.
- To evaluate the medications used in DKD.
- To evaluate the therapeutic outcomes
- To evaluate the medications used in Diabetes Mellitus and to evaluate the medications used in chronic kidney disease.

RESEARCH METHODOLOGY

A prospective observational study was conducted for 6months duration in Nephrology department. Based on the inclusion criteria and exclusion criteria the DKD patients were recruited in the study. We have obtained the informed consent forms from those who are willing to participate in the study. The data was collected from personal interviews (patient& / or patient representatives), professional interviews (doctors/nurses/technicians) by using a well structured patient data collection proforma and followed up.

RESULTS

Diabetes with CKD data where analyzed based upon the different types of parameters. As per gender wise

distribution of the patients males (58.3%) are more likely affected with DKD then females (41.6%)

Table 1: Gender

S.NO	GENDER	NO.OFPATIENTS	PERCENTAGE
1.	Male	35	58.3%
2.	Female	25	41.6%

Table 2: Age

S.NO	AGEGROUP	NO.OFPATIENTS	PERCENTAGE
1.	<20yrs.	3	5%
2.	>20yrs.	12	20%
3.	Above50yrs.	45	75%

Table 3: Type of DM

S.NO	TYPE OF DM	NO.OF PATIENTS	PERCENTAGE
1.	Type1DM	8	13.3%
2.	Type2DM	50	83.3%
3.	Gestational DM		3.3%

Table 4: Complications of CKD

S.NO	COMPLICATION OF DKD	NO.OF PATIENTS	PERCENTAGE
1.	Diabeticnephropathy	4	6%
2.	Hyperkalaemia	10	16.6%
3.	Heartstroke	15	25%
4.	Anaemia	3	5%
5.	ESRD	5	8.3%
6.	Pulmonaryedema	10	16.6%
7.	Ischemicheartdisease	10	16.6%
8.	Urinarytractinfection	3	5%

Table 5: Stage of CKD

S.NO	STAGES OF DKD	NO.OF PATIENTS	PERCENTAGE
1.	Stage1	15	25%
2.	Stage2	20	33.3%
3.	Stage3	12	20%
4.	Stage4	8	13.3%
5.	Stage5	5	8.3%

Table 6: Diabetic treatment regimen

S.NO	TREATMENT REGIMEN	NO.OFPATIENTS	PERCENTAGE
1.	Dialysis	20	33.3%
2.	Renal transplantation	10	16.6%
3.	Insulin therapy	10	16.6%
4.	Metformin therapy	15	25%
5.	Other drugs	5	8.3%

Table 7: CAUSE OF DKD

S.NO	CAUSE OF DKD	NO.OFPATIENTS	PRECENTAGE
1.	Highbloodglucose	40	75%
2.	HighBP	20	25%

Table 8: Risk factors of CKD

S.NO	RISK FACTORS OF DKD	NO.OFPATIENTS	PERCENTAGE
1.	Highbloodglucose	10	16.6%
2.	HighBP	10	16.6%
3.	Highcholesterol	12	20%
4.	Obesity	6	10%
5.	Age	7	11.6%
6.	Smoking	2	3%
7.	Familyhistory	6	10%
8.	Diet	7	11.6%

DISCUSSION

Diabetic kidney disease is a type of kidney disease caused by diabetes. Diabetes is the leading cause of kidney disease. About 1 out 3 adults with disease have kidney disease. The main job of the kidney to filter wastes and extra water out of our blood to make urine. The main causes of DKD are high blood glucose and high blood pressure. as per our study we concluded that high blood sugar is the most important causes for DKD. Around 75% of people with high blood sugar show DKD. In the present study the maximum number of people was observed above 50 yrs age group. This generally includes the patient with above 50 yrs are from socioeconomic group in developing countries19-22. At the age above 50 yrs

maximum high blood glucose and high BP patients were appeared in more number due togreater urbanisation, change in life styles and environmental factor. High cholesterol, obesity and diet are the major risk factors for DKD according to our observational studies. Diet shows a major impact on the diabetes when we eat extra calories and fat, our body creates an undesirable rise in blood glucose (hyperglycaemia), it may lead to serious problems that if persistent, may lead to long term complications, such as nerve, kidney and heart damage. Obesity is the leading risk factors for type 2 diabetes with may lead to serious kidney problems. In our study mostly married people are showing diabetic kidney disease those are lived in urban areas in developing countries.

Mostly middle-class people are prone to DKD with or without diabetes mellitus mostly the patients doesn't have family history of DM. Mostly illiterate people are prone to DKD due to lack of awareness. DKD leads to various types of complications in which heart stroke and kidney failure is the major complication of DKD. The complication includes diabetic retinopathy, End stage renal failure[ESRD], hyperkalaemia ,heart stroke, anaemia, pulmonary oedema, ischemic heart disease, urinary tract infection23-25.

CONCLUSION

This is the first that a study carried out in nephrology department of KIMS hospital on prevalence of diabetes mellitus with chronic kidney disease. The overall prevalence rate of diabetes with kidney disease is found to be 34.4% and diabetes Is found in 74.2millionspatientsall over the world. Majority of the patients with diabetes are mainly affected the kidneys and it indicates the major public health problem in our country. Majority of the patients who have above 50 yrs and obesity are easily affected with diabetes due to high blood glucose production in blood26-27. Mostly patients with type2 DM will affect the kidneys. But finally, We concluded that the risk factors for DKD were assessed as age group, gender, obesity, high BP, high blood sugar, high cholesterol, illiteracy, urbanization, life style modifications. Totally we concluded that most patients with DM will affect kidney that may prolong the renal failure.

As per our study we finally stated that there are different stages of DKD (stage 1,2,3,4 and 5). Most of the patients in DKD are observed in stage 2. There are different treatments for DKD like insulin therapy, metformin therapy, angiotensin receptor blockers, beta adrenergic blocking agents, dialysis and renal transplantation. Along with this patient education is also an important factor to create awareness about disease. In our present study DKD would be treated by medication therapy with metformin, candesartan, Eprosartan, propranolol and atenolol for life long due to the chronic condition if the complete kidney damage follows the dialysis or renal transplantation to overcome the serious issue.

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