COMPARISON OF KIDNEY DISEASE PREVALENCE IN TYPE 2 DIABETIC PEOPLE AND NON-DIABETIC PEOPLE: A CROSS-SECTIONAL STUDY.

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Abstract.

Aim:

The key motive of this research is to evaluate the frequency of kidney diseases in subjects with type 2 diabetes vs. nondiabetic patients. For the estimation of the similarity between the relation of normoalbuminuria and microalbuminuria with type 2 diabetes and on which point renal diseases different percentage of the patient of type 2 diabetes lies.

Materials and Methods:

This was a cross-sectional study of 200 cases organized at a tertiary care center in Bihar, India. 100 patients with type 2 diabetes and 100 nondiabetic patients of the same age and gender were included. The study was performed for 24 months, and all the patients were 20-80 years of age.

Results:

It was evaluated that the incidence of kidney diseases in subjects with diabetes was higher in contrast to non-diabetic subjects. No gender-wise variation was found. The majority of the patients had a period of diabetes between 5 and 10 years. Hypertension was common in both the groups that are type 2 diabetic and nondiabetic.

Conclusion:

Chronic kidney diseases are highly frequent in diabetic patients. There is a need to deal with hypertension, increased BMI, and weight.

Recommendation:

An antihypertensive regimen that includes an angiotensin-converting enzyme (ACE) inhibitor or an angiotensin receptor blocker (ARB) is recommended for Type 2 diabetic patients.

Keywords: Kidney diseases, high blood pressure, diabetes, Submitted: 2023-09-29, Accepted: 2023-09-29

1. INTRODUCTION.

Diabetes is an epidemic and increasing rapidly all around the world. Diabetes is the most frequent endocrine disorder and is common in most of the population. Diabetes mellitus and hyperglycemia have the same phenotypes. By the year 2010 around 221 people and 300 million by the year 2025 will be affected by diabetes mellitus in which greater number of people will be from Asia and Africa according to the World Health Organization [1, 2]. In Africa there is a lack of diagnostic tools, patients do not come on time for the treat-

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ment, lack of education, uncontrolled sugar, and lack of screening which is why diabetes is more prevalent there [3, 4]. The main problem of diabetes mellitus is chronic kidney disease. Chronic kidney diseases are not checked in many countries in diabetic patients because of a lack of diagnostic tools [1-4]. A microalbumin test is not done in all healthcare centers [3].

Diabetes mellitus causes microvascular and macrovascular reactions which is the main cause of the increase in death rate. It is expected that India will be the diabetic hub in the coming future. Diabetes is the chief cause of renal disease in India as well as in other parts of the world. Diabetic neuropathy can be controlled in many ways but to be successful these methods should be started being started as soon as possible. The rising number of neuropathies in patients with diabetes is 27%. In 6-10% of patients has already have diabetic neuropathy when type 2 diabetes was detected in them [5].

Neuropathy is the leading cause of morbidity and death in type 2 diabetes. Constant increase of albumin is the main characteristic of chronic kidney diseases. Mogensen staging system includes 5 stages and stage 3 is microalbuminuria also called incipient neuropathy [6]. Controlled microalbuminuria decreases the risk of renal and heart diseases.

Poor control of sugar is the risk factor for the start of diabetic neuropathy. The factors that are involved in type 2 diabetes include age, cholesterol, elevated protein during the diagnosis, family history of diabetes, overweight, and smoking. Patients above the age of 50 are more prone to neuropathy with type 2 diabetes. Keeping a check on blood pressure and sugar can stop diabetic neuropathy from developing. When type 2 diabetes mellitus is detected in a patient having type 1 diabetes for more than 5 years it is recommended for microalbuminuria test [6]. In this study, the main aim was to evaluate the incidence of kidney diseases in diabetic patients and nondiabetic patients.

2. MATERIALS AND METHODS.

2.1. Study Design and Population.

. cross-sectional study of 200 patients was carried out at a tertiary care center. The patients having type 2 diabetes and nondiabetic patients were taken in this study. 100 patients with type 2 diabetes and 100 nondiabetic patients of the same age and gender were included.

2.2. Study Location and Duration.

This study was conducted in Nalanda Medical College located in Patna, Bihar, India. The study was conducted for 24 months. Patients with abnormal renal functions are followed up after 3 months.

2.3. Inclusion criteria.

Age group between 20-80 years, patients with type 2 diabetes and nondiabetic patients, diabetic patients regardless of treatment.

2.4. Exclusion criteria.

Patients with type 1 diabetes, patients with gestational diabetes, history of dialysis, patients who underwent kidney transplants, prolonged illness.

2.5. Data Collection.

Data of the patients was recorded by performing physical examinations, laboratory tests, and taking history. Investigations of Complete blood count, urine RE/ME, urine albumin to creatinine ratio, serum creatinine, and fasting blood sugar were collected.

2.6. Statistical Analysis.

The SPSS version of the software was used for statistical analysis. T-tests were carried out to find the statistical importance of the difference in the mean value of the various reactions. The chi-square test or Fisher's exact test was done for non-parametric data.

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3. RESULTS.

A total of 200 patients were included in this study. At the initial stage, several 231 patients were examined for eligibility, however, 31 patients were excluded from this study due to not being eligible.

As shown in Table 1, the 21-30 years and 31-40 years of age group includes 72 patients. 42 patients were in the age group of 41-50 years, 38 patients were in the 51-60 years of age group, and 48 patients were above the age of 60 years.

In table 2, 110 patients were males, and 90 patients were females. There was no significant gender-wise difference seen. The incidence of high blood pressure in diabetic patients was 65% whereas patients without diabetes had 71%. There was not much difference between the two groups about hypertension. The risk of CKD is higher in patients with high blood sugar as compared to patients without diabetes.

4. DISCUSSION.

Diabetes mellitus is a syndrome with disordered metabolism where the extent of inflammation is not in control, aversion to insulin, and vasoconstriction. Excess blood sugar because of deficiency of insulin secretion insulin resistance or both [7]. According to many studies, individuals with diabetes should control their blood sugar to stop the advancement of the disease and to inhibit the appearance of microvascular and macrovascular complications [8, 9]. Retinopathy, neuropathy, and Chronic kidney disease are microvascular complications [10]. Macrovascular complications are directly proportional to resistance and microvascular complications are directly proportional to diabetes control. Diabetes mellitus is an activating factor in causing kidney injury. Diabetes also leads to renal dysfunctions [11]. Chronic kidney disease is diagnosed in stages 3,4 and 5 when there are metabolic derangements, in stages 1 and 2 it remains asymptomatic [12]. Chronic kidney disease is diagnosed by ultrasound imaging of the kidney indicating a change in cortico-medullary junction, albumin-to-creatinine ratio, and kidney function test after three months [13, 14].

CKD affects both financially and physically to the patient and reduces the physical quality of life index and human development index which follows more hospital visits and hampering office work hours [15, 16]. The main factor for end-stage renal disease and chronic kidney disease is diabetic kidney disease. Chronic kidney disease is mainly caused by diabetic kidney disease in forty-five percent of patients worldwide, some other causes are hypertension with CKD, glomerulopathies, etc [17, 18].

In this study, it was evaluated the frequency of kidney diseases in type 2 diabetes in contrast with nondiabetic patients. Mainly the patients were over the age of 55 years. The mean age was 47 years. The prevalence of CKD in diabetic cases was 45% and in non-diabetic patients was 15%. A study was carried out in a multicentre in India which showed frequency of diabetes associated with CKD was 62% [19]. Many studies were done in India before in which the prevalence of diabetes kidney disease was around 35% [20]. Cross-sectional research was done by Chinese scholars in which they evaluated that 38.9% of people with diabetes had CKD [21]. In Japan, they carried out a study for diabetes data clinical management which shows 15.5% of diabetic cases have low eGFR [22].

Oral anti-hyperglycemic drugs can be given to the patients to control blood sugar. The patients with decreasing eGFR OHA can be given according to the treatment manuals. Generally, metformin is not prescribed in CKD stage 4 and is contraindicated in stages 4 and 5 of CKD [23]. In stages 4 and 5 of CKD, the agent that was highly relied on was insulin [24, 25]. The drugs that can be used in stages 3b and 4 of CKD are glimepiride and glipizide [26]. Insulin administration is the better choice for CKD and type 2 diabetes mellitus.

5. CONCLUSION.

In this study, it was evaluated that patients with high blood sugar are more vulnerable to kid-

Table 1: **Age-wise distribution of studied subjects.**

Age groups (in years)	Number	Percentage
21-30	36	18
31-40	36	18
41-50	42	21
51-60	38	19
Above 60	48	24
Total	200	100

Table 2: **Gender-wise distribution of studied subjects.**

Gender	Number	Percentage
Male	110	55.0
Female	90	45.0
Total	200	100

ney diseases as compared to patients without diabetes. To decrease renal deterioration therapies are needed. Dialysis centers are being set up by the government at the district level. Proper resources are also needed for the test of microalbumin and S. creatinine in villages. Diabetes increases BMI/weight, deranged lipid profile levels and hypertension need to be addressed.

6. LIMITATIONS.

The limitations of this study include a small sample population who were included in this study. The findings of this study cannot be generalized for a larger sample population. Furthermore, the lack of a comparison group also poses a limitation for this study's findings.

7. RECOMMENDATION.

An antihypertensive regimen that includes an angiotensin-converting enzyme (ACE) inhibitor or an angiotensin receptor blocker (ARB) is recommended for Type 2 diabetic patients.

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9. LIST OF ABBREVIATIONS.

BMI- Body mass index
ACE- angiotensin-converting enzyme
ARB- angiotensin receptor blocker
RE/ME- Urine Routine Examination/ Microscopic Examination
SPSS- Statistical Package for Social Sciences
CKD- chronic kidney disease
eGFR- estimated glomerular filtration rate
OHA- Orally administered antihyperglycemic agents

10. SOURCE OF FUNDING.

11. CONFLICT OF INTEREST.

The authors report no conflicts of interest in this work.

12. PUBLISHER DETAILS.

13. REFERENCES.

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