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Significance Of Serum Urea And Creatinine Levels In Type 2 Diabetic Patients

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Abstract*: Diabetes Mellitus is the most non- communicable disease in the world .Renal complication are one of the major complication apart from cardiovascular , neurological & retinal complication .Due to increase population , rapid urbanization sedentary life style & increase prevalence of obesity , it has become a major health hazard .A total of 60 diabetes type 2 patients and 60 controls of both sexin the age group 35 – 75 years were included in the study . We observed that 58.3% of DM type 2 showed elevated serum urea levels and 50% showed elevated serum creatinine levels. P value(<0.05) was found to be stastically significant..*
Key Words*: Diabetes, Blood urea, Creatinine, Glucose.*

I. Introduction

Diabetes mellitus is characterized by chronic hyperglycemia, that is, high blood glucose due to derangement in carbohydrate, fat, and protein metabolism. Diabetes mellitus is associated with absolute or relative deficiencies in insulin secretion, insulin action or both [(1,2)].According to the World Health Organization (WHO), Diabetes mellitus affects more than 170 million people worldwide, and this number will rise to 370 million by 2030[(3 ,4)]. Diabetes mellitus is classified primarily into Type I and Type II.TYPE I Diabetes mellitus is mainly idiopathicor caused by autoimmune disorders . Type II Diabetes mellitus arises from insufficient production of the hormone insulin from beta cells of the pancreas or in conditions where the peripheral receptors; primarily muscles, liver and fat tissue do not respond adequately to normal insulin levels known as insulin resistance[(5)].Diabetic nephropathy occur in approximately in one third type 2 diabetic patients [(6)] .In diabetic Nephropathy a number of serum markers are known to be deranged with significant morbidity & mortality [(.7)]It leads to tissue scarring , urine protein loss & eventually CKD ,sometimes required dialysis & kidney transplantation [(8)].A number of life style factor are known to be important to the development of Type 2 Diabetes , including obesity(BMI > 30), lack of physical activity , poor diet , stress & urbanization [(9)]

Aim Of Study

1. To measure serum urea &creatinine levels in diabetes type 2 and non- diabetic samples .
2. To correlate blood sugar levels with urea&creatinine levels .

II. Materials And Methods

A total of 60 diabetestype 2 patients of both sexes with age between 35 -75 years were included in study and same number of non- diabetic individuals of both sexes of same age group were taken as controls.We excluded patients with dehydration, muscle dystrophy, glomerulonephritis, pyelonephritis ,eclampsia& preeclampsia, congestive heart failure, urinary tract obstruction, taking nephrotoxic drugs such as aminoglycosides, cemitidine, cefoxitin, etc.

Sample :5ml of fasting venous blood was collected after overnight fasting. Samples were analyzed on EM360.

Estimation Methods:

1) Glucose was estimated by GOD – POD method.[10)]
2) Estimation of Creatinine was done by the modified Jaffe's method[11 ,12].
3) Serum urea was done by Urease – Berthelot's method[13] .

III. Statistical Analysis

The results were expressed as mean ± standard deviation. A $p < 0.05$ was considered statistically significant. Student ' t ' test was used to compare between the groups .

IV. Results

The total number of patients were 120 (60 cases & 60 controls).The number of females in controls were 22 and males were 38 whereas in cases number of females were 19 and males were 41 as shown in Table 1

	CONTROLS	CASES
MALES	38	41
FEMALES	22	19

Table 1: Sex Distribution Among Cases And Controls

The mean value of fasting blood sugar levels in cases is 195mg/dl with standard deviation of 45.11 . P value is<o.o5 which is stastically significant. The mean value of serum urea in cases is 68.85 with standard deviation of 46.87. Its P value is<o.o5,which is significant.The mean value of serum creatinine is 1.91 with standard deviation of 1.34.Its P value is <0.05 ,which is also significant

Table 2 : Serum creatinine, urea & fasting glucose levels in patients with diabetic patients compared to healthy controls .

	Controls (n =60) Mean ± SD	Cases(n=60) Mean ±SD	P value
Age (Years)	53.9 ± 11.04	56.21 ± 13.41	
FBS (mg/dl)	87 ± 8.91	195 ± 45.11	< 0.05
Urea (mg/dl)	25.08 ± 7.12	68.85 ± 46.87	< 0.05
Creatinine (mg /dl)	0.77 ± 0.09	1.91 ± 1.34	< 0.05

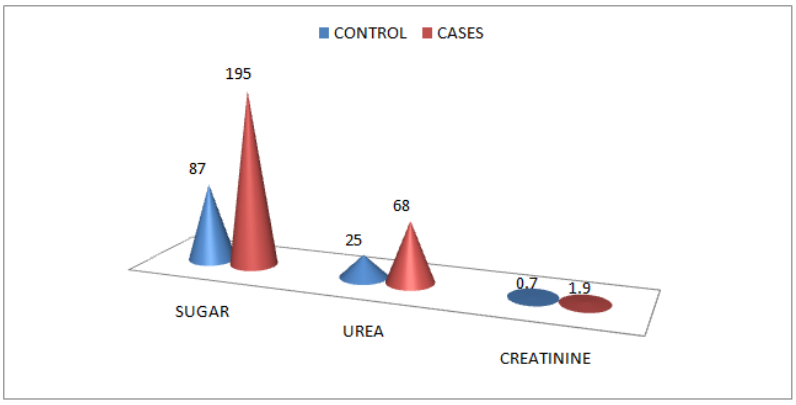
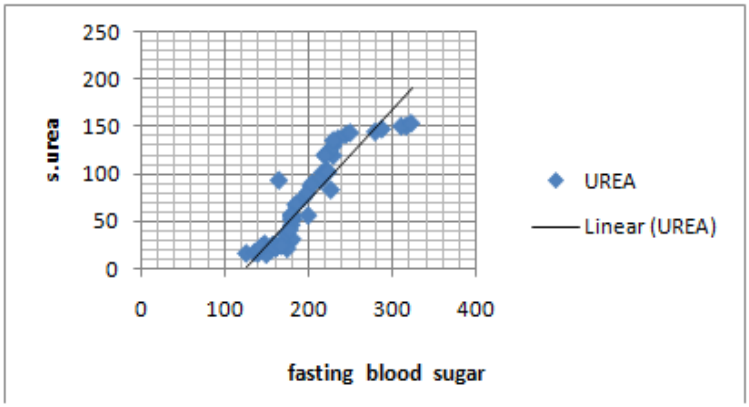


Fig -1: Mean of Sugar, Urea &Creatinine Levels In Controls & Cases.

Correlation between fasting blood sugar and serum urea levels



The correlation between fasting blood sugar and serum urea is positive .r = o.91 and P value is less then o.05 .

V. Discussion And Conclusion

Impairment in renal function is assessed by estimating the serum urea levels & the serum creatinine levels.

In our study we observed that 58.3% of DM type 2 showed elevated serum urea levels and 50% showed elevated serum creatinine levels. P value(<0.05) was found to be stastically significant.

A research conducted by Anjaneyulu et al 2004 had found that increase urea & serum creatinine in diabetic rats indicate progressive renal damage[14].

SugamShrestha et al also found strong correlation between fasting blood sugar and serum urea level [15].ManjunathaGoud B .K et al concluded in their study that blood urea &creatinine is accepted to asses the renal function .[16]

As DM is the major cause of renal morbidity & mortality, so a good control over the sugar level can halt the progression of renaldamage.

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