

## Research Article

# Some studies of the renal function in Type-I vs Type-II Diabetics from hospitals District Multan (Punjab) Pakistan

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### Abstract

This study was conducted in the patient for the treatment of disease of Urea. This was done in different hospitals of District Multan for the measurement of urea, creatinine and uric acid in insulin-dependent Diabetics (ID) and non-insulin-dependent diabetics (NID) patients 132 subjects were studied and divided into the three types of groups i.e. control, type-I (Below the age 40) and type-II (subsequent to age 40) blood samples were drawn by venipuncture and tested with the help of commercial kits. NID patients showed impaired renal function (Urea and Creatinine levels considerably raised) which was more marked in males. NID diabetics, therefore just like ID diabetics are also at risk for developing nephropathy. Hyper uricemia was also noted in NID females. Both are important risk factors predisposing to atherosclerosis and coronary heart disease in NID patients. This is beneficial for the society and scientific community to prevent such type of diseases.

**Keyword:** Control; Diabetics; Hospitals; Hypoglycemic Agents; Multan; NID; ID; Renal Function

## Introduction

ID (Insulin dependent diabetes mellitus or type-I) Is known as typically abrupt and there may be temporary remissions. The patients which belong to much younger age group are thin and underweight [1].

It is not a benign disease. The prolonged survival of this diabetics is due to insulin therapy and associated with an increasing prevalence of complication which affects the microcirculation of eye, nerves, large vessels and kidney. Increase in blood pressure both in patients with micro and macro albuminuria accelerates nephropathy [2]. The maintenance of normal blood glucose levels may prevent or even delay diabetic nephropathy. Similarly treating raise to arterial pressure with anti hypertensines may reduce the progression of nephropathy [3].

NID (Non-Insulin-dependent diabetes mellitus or type-II) is known as the typically gradual in onset, which usually occurs in the middle age and is often present for many years before diagnosis.

In the obese hyperglycemia tends to worsen gradually until there is mitigation of the obesity.

Similarly, ID nephropathy also develops in the type II diabetic patients. In type II patients, microalbuminuria in predictive of clinical proteinuria and increased rate of mortality [3]. Based on IDF (International-Diabetic-Federation) directory on diabetics, Pakistan currently is being at the number 7<sup>th</sup> in the rank of all over the nations, that is the biggest number of diabetics cases. In Pakistan the diabetic number of population estimation was at 9.1 million in 2018 and it will be reached 11.5 million at the end of year 2025 with Pakistan ranking number 5<sup>th</sup> in the position in IDF list [4].

The current study is based on the assessment of renal function in the two major types of diabetics which are known as type I vs type II with respect to their age, genders, weight and timeline of diabetes in the patients of

Pakistan residing in District Multan.

## Materials and Methods

For the purpose of this study the subjects were selected from different hospitals of District Multan. Total number of subjects were One Hundred Thirty-two (132), out of which Forty-five (45) subjects were insulin dependent (ID) diabetic patients, Forty-five (45) were non-insulin dependent (NID) diabetic patients and forty-two (42) subjects were selected as normal healthy controls. All these subjects were divided as follows;

a. Healthy volunteer controls: Twenty-two (22) males and twenty (20) females who did not have history of diabetes mellites and other metabolic disturbance and who were clinically considered to be healthy.

b. Type-I or ID diabetics patients: Twenty-three (23) males and twenty-two (22) female diabetics before age of 40 years. These were thin, lean patients were solely on insulin injection.

c. Type-II of NID diabetics patients: seventeen (17) males and twenty-eight females (28) developed diabetics after the age of 40 years, were on either oral hypoglycemic agents of dietary control.

A brief history of the patients such as age, sex, duration of diabetes, treatment, symptomatology, past disease history, addiction, dietary habits, family disease etc. were noted.

The blood samples from above subjects were collected between 8:00 A.M. to 10:00 A.M. For the determination of urea, creatinine and uric acid, about 10 ml of blood was drawn by venipuncture from the orbital vein. For albumin determination urine was also collected. All these tests were done with commercial kits.

## Results

Males and females of NID (Non-insulin dependent diabetes mellitus type-II) show higher urea content as compared with their respective controls and ID (Insulin-dependent-diabetes mellitus type-I) males

and females (Table 1).  
 The ID and NID females had higher blood urea level as compared with that of urea of ID and NID males (Table 1).  
 Uric acid and creatinine content of blood

serum of ID and NID females were not significantly different from their respective control values. The NID males have significantly higher serum creatinine level as compared with those of ID or control males.

**Table 1. Results of kidney function tests in 22 ID and 28 NID females and 23 ID and 17 NID males**

Parameters	FEMALES			MALES		
	Control (n=20)	ID (n=22)	NID (n=28)	Control (n=22)	ID (n=23)	NID (n=17)
Urea	24.62±1.11	30.9±2.86	38.70±4.57*	24.24±1.31	26.45±1.61	32.09±2.92*
Creatinine	0.9±0.03	1.00±0.01	1.57±0.04	10.88±0.08	0.84±0.05	1.82±0.13*
Uric acid	4.99±0.21	5.39±0.31	6.97±0.27	5.87±0.35	5.42±0.38	5.61±0.36

\*P<0.05. ID, insulin dependent diabetic patients;  
 NID, non-insulin dependent diabetic patients

### Discussion

Slightly increased urinary excretion of albumin has been shown to be predictive of clinical nephropathy in ID diabetics [5]. Forty percent (40%) of all patients with ID diabetes develop diabetic nephropathy, which is the main cause of morbidity and mortality in these patients [6]. Certain other factors such as raised blood pressure, smoking and poor metabolic control etc increase duration of disease [2].

Like ID patients NID patients also have a tendency to develop renal complications [3]. Comparing diabetics with control we found significant results (P<0.05) in urea and creatinine levels in ID and NID females.

Comparing ID and NID patients with each other, the NID patients once again showed significant increase (P<0.05) in the levels of urea. The creatinine levels were non-significant in NID females as compared with ID females, while NID males showed significant increase (P<0.05) in creatinine compared with ID males. Thus, we conclude that our NID patients especially NID males have much more marked renal impairment predisposing to nephropathy. This tendency towards nephropathy in NID patients may also be due to the presence of certain other risk factors which lead to increased mortality.

Urea was found to be non-significant when we compared ID males with ID females and NID males with NID females.

In ID males as well as in NID patients' creatinine was found to be non-significant. In NID patients as compared with ID patients the increased risk for nephropathy is also favored by the detection of proteinuria. In the case of NID, we found an increase percentage (%age) of protein. Thus, we can say that like ID patients' renal complications can also develop in NID patients.

Large scale in population studies have documented for the elevation of uric acid's serum that accompany hypertension and obesity [7]. Similarly, impaired glucose tolerance is also followed by elevated uric acid. In the absence of nephropathy, overt diabetes is said to be associated with low levels [8]. In our study ID and NID patients, both male and female, show non-significant change when compared with control [9].

### Conclusion

Thus, we draw the conclusion that NID patients especially NID females have increased uric acid levels and uric acid have relation with hyperinsulinemia, and insulin is shown to atherogenic. Epidemiological data have shown that increased uric acid is associated with an enhanced risk for

Atherosclerotic heart disease, but so far non pathophysiologic procedure has been identified to explain this connection.

#### Authors' contributions

Conceived and designed the experiment: M Zafar & M Abrish, Performed the experiments: MM Malik, M Zafar, MT Sajjad, S Ali, M Talal, A Mumtaz & U Mumtaz, Analyzed the data: MM Malik & S Masud, Contributed materials / analysis / tools: M Zafar, MS Noor, S Masud, MH Latif, T Khan, R Abdur Rehman, M Wajid & M Khalil, Wrote the paper: M Zafar.

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