

ASSESSMENT OF PREVALENCE OF HYPERURICEMIA AMONG NEWLY DIAGNOSED PATIENTS OF TYPE 2 DIABETES MELLITUS

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ABSTRACT

Background: Various studies have been reported that the association of serum uric acid levels with diabetes as a risk factor among prediabetes individuals to type 2 diabetes mellitus. It is well known that Serum uric acid is formed in the body by the breakdown of purines. Various studies have been reported that elevated serum uric acid is found to be associated with diabetes mellitus. **Material & Methods:** The present prospective study was conducted at the Department of General medicine of our tertiary care hospital. Patients were enrolled from the outdoor and the ward by simple random sampling. Clearance from Institutional Ethics Committee was taken before the start of the study. Written informed consent was taken from each study participant. All newly diagnosed patients (diagnosed within 3 months) with diabetic Mellitus were enrolled in the present study. **Results.** In the present study, based on HbA1c levels and hyperuricemia, out of the total majority of study participants 30% patients had HbA1C levels 6.5-8 out of these 10 patients had hyperuricemia which was followed by 29% patients had HbA1C levels >11 out of these 15 patients had hyperuricemia which was followed by 24% patients had HbA1C levels 8.1-9.5 out of these 11 patients had hyperuricemia which was followed by 17% patients had HbA1C levels 9.6-11 out of these 8 patients had hyperuricemia. This difference was statistically non-significant. **Conclusion:** We concluded from the present study that serum uric acid may be used as an independent diagnostic marker for the risk of the development of prediabetes to diabetes and its progression and complications. Patients with high HbA1C levels should be tested for serum uric acid levels.

Keywords: hyperuricemia, Diabetics Mellitus, HbA1C levels.

INTRODUCTION

Diabetes is a chronic disease in etiology and occurs when the pancreas does not produce enough amount of insulin or when there is resistance towards its action on the body (1). It is well known that insulin resistance at peripheral tissues (muscular tissue and adipose) plays a key role in the glucose metabolism disturbance in diabetes. Previous studies reported that chronic inflammation also leads to the occurrence of insulin resistance (2). The prevalence of non-communicable diseases is increasing compared to communicable diseases. Among the non-communicable diseases, diabetes mellitus is rapidly increasing globally and affecting all age groups (3).

In 2014, WHO reports that 8.5% of adults aged 18 years or above had been diagnosed with diabetes. It was estimated that by the year 2030 diabetes will become the seventh leading cause of mortality worldwide. In 2016, WHO reports that diabetes was directly responsible for 1.6 million mortality occurred worldwide (4). In India, the prevalence of diabetes is increasing and imposing challenges on the health care infrastructure of the country (5). The etiopathology of hematogenous diabetes is complex and it is not precisely reported in previous studies but porto-systemic shunting of insulin reported in systemic hyperinsulinemia which leads to

subsequent downregulation of insulin receptors which results in insulin resistance (6).

Various studies have been reported that the association of serum uric acid levels with diabetes as a risk factor among prediabetes individuals to type 2 diabetes mellitus. It is well known that Serum uric acid is formed in the body by the breakdown of purines (7). Physiologically majority of children have serum urate levels concentrations of 180 to 240 mmol (3 to 4 mg/dl) levels started to increase among males during puberty but levels have remained low among females until menopause. Various studies have been reported that elevated serum uric acid is found to be associated with diabetes mellitus (8). The present study was conducted to evaluate the insulin resistance and prevalence of hyperuricemia among patients of diabetes mellitus at our tertiary care center.

MATERIALS & METHODS

The present prospective study was conducted at the Department of General medicine of our tertiary care hospital. The study duration was January 2019 to July 2019. A sample size of 100 was calculated at a 95 % confidence interval at a 10 % acceptable margin of error by epi info software version 7.2. Patients were enrolled from outdoor and from the ward by simple random sampling. Clearance from Institutional Ethics Committee was taken before the start of the study. Written informed consent was taken from each study participant. All newly diagnosed patients (diagnosed within 3 months) with diabetic Mellitus were enrolled in the present study.

All the study participants were subjected to recording demographic details as per the proforma. All the study participants who had previously diagnosed diabetes mellitus and patients who were in diabetes treatment, age less than 18 years, patients with chronic diseases or malignancies, patients taking Thiazides, corticosteroids, and Phenytoin were excluded from the present study. Patients with a history of alcoholism, B12 deficiency, thyroid disorder, drugs causing hyperuricemia ex. Pyrazinamide and Pregnant mothers were excluded from the present study. All the study participants were subjected to routine blood and urine investigations such as CBC, ESR, RBS, FBS, HbA1c, serum uric acid levels, urine routine, and microscopy. All the data was recorded on a Microsoft Excel spreadsheet and data analysis was done at 5% alpha and 95% confidence interval using SPSS v22 software. Test of significance was applied on collected and organized data and a p-value less

than 0.05 was considered as a statistically significant association between study variables.

RESULTS

In the present study, we enrolled 100 newly diagnosed patients (diagnosed within 3 months) with Diabetic Mellitus. Clearance from Institutional Ethics Committee was taken before the start of the study. Written informed consent was taken from each study participant. Study participants were enrolled from the outdoor and the ward by simple random sampling. The age of study participants was ranged from 28 years to 72 years. The mean age of cases was 46.2 ± 3.1 years. Out of the total study participants, it was reported that males 59% were likely affected more than females 41%. The mean BMI of cases was 26.9 ± 2.31 . A family history of diabetes mellitus was present in 70 % of patients. The incidence of hyperuricemia among study participants was seen in 44 % of patients. (Table 1)

Table 1: Distribution of study subjects according to age, gender, and BMI.

Study parameters		
Mean age	46.2 ± 3.1 years	
Gender	Male	59%
	Female	41%
BMI (Kg/m ²)	26.9 ± 2.31	
Family history of diabetes mellitus	70 % patients	
Incidence of Hyperuricemia	44 % patients	

In the present study, based on HbA1c levels and hyperuricemia, out of the total majority of study participants 30% patients had HbA1C levels 6.5-8 out of these 10 patients had hyperuricemia which was followed by 29% patients had HbA1C levels >11 out of these 15 patients had hyperuricemia which was followed by 24% patients had HbA1C levels 8.1-9.5 out of these 11 patients had hyperuricemia which was followed by 17% patients had HbA1C levels 9.6-11 out of these 8 patients had hyperuricemia. This difference was statistically non-significant. (Table 2)

Table 2: Distribution according to HbA1c levels and hyperuricemia.

HbA1C levels	No. of patients	Hyperuricemia	P-value
6.5-8	30%	10%	>0.05 (NS)
8.1-9.5	24%	11%	
9.6-11	17%	8%	
>11	29%	15%	
Total	100%	44%	

DISCUSSION

In the present study, we enrolled 100 newly diagnosed patients (diagnosed within 3 months) with diabetic Mellitus. Clearance from Institutional Ethics Committee was taken before the start of the study. Written informed consent was taken from each study participant. Study participants were enrolled from the outdoor and the ward by simple random sampling. The age of study participants was ranged from 28 years to 72 years. The mean age of cases was 46.2 ± 3.1 years. Out of the total study participants, it was reported that males 59% were likely affected more than females 41%. The mean BMI of cases was 26.9 ± 2.31 . A family history of diabetes mellitus was present in 70 % of patients. The incidence of hyperuricemia among study participants was seen in 44 % of patients. Similar results to the present study were obtained in a study conducted by Deep HS et al among 100 patients diagnosed with diabetes mellitus. They reported Insulin resistance was observed in 79 patients out of 100 patients. The p-value is <0.001 which is statistically highly significant (9).

In the present study, based on HbA1c levels and hyperuricemia, out of the total majority of study participants 30% patients had HbA1C levels 6.5-8 out of these 10 patients had hyperuricemia which was followed by 29% patients had HbA1C levels >11 out of these 15 patients had hyperuricemia which was followed by 24% patients had HbA1C levels 8.1-9.5 out of these 11 patients had hyperuricemia which was followed by 17% patients had HbA1C levels 9.6-11 out of these 8 patients had hyperuricemia. This difference was statistically non-significant. Similar results to the present study were obtained in a study conducted by Tae W et al among

53477 patients diagnosed with diabetes mellitus. They reported similar results to the present study (10).

Similar results to the present study were obtained in a study conducted by Grover A et al among 50 patients diagnosed with diabetes mellitus. They reported Out of which 29 patients were Males and 21 patients were females. Out of 29 male patients, 20% patients had HbA1c Levels in the range of 6.5-8, 8% patients in the range 8.1-9.5, 12% patients in the range of 9.1-11 and 18% patients had HbA1C >11 whereas out 21 female patients, 06 patients had HbA1c Levels in the range of 6.5- 8, 14% patients in the range 8.1-9.5, 4% patients in the range of 9.1-11 and 12% patients had HbA1C>11. The total no. of study participants with newly diagnosed diabetes with hyperuricemia was 64% (11).

CONCLUSION

We concluded from the present study that serum uric acid may be used as an independent diagnostic marker for risk of the development of prediabetes to diabetes and its progression and complications. Patients with high HbA1C levels should be tested for serum uric acid levels. Hyperuricemia seems to be a useful investigation in newly diagnosed diabetics.

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