Correlationbetween Serum Uric Acid Level and Glycated Haemoglobin Level inDiabetic patients Of Population of Jamshedpur, Jharkhand, India

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Abstract
Background:*Number of people with diabetes mellitus has increasing rapidly worldwide over the past many decades and it is an important public health challenges to the country. Present study was undertaken to compare the levels of HbA1c, serum uric acid in patients with diabetes mellitus with normal healthy individuals of Jamshedpur, Jharkhand, India.*
Methods: *This is study was undertaken in the Central Laboratory, M.G.M Medical College & Hospital, Jamshedpur, Jharkhand, India. Total 200 subjects included in this study (Group I: 100 normal healthy individuals, who were in the age group 30-80 years, of both sex. Group II: 100 patients of diabetes mellitus of same age group). Fasting blood samples were taken and investigated for serum uric acid, blood sugar, and HbA1c and value compared with those of normal healthy subjects. Means ± standard deviation were calculated and student t-test was applied to find out significance level.*
Results: *Mean serum levels of FBS (86.71 ± 10.22), HbA1c (4.93 ± 0.53), uric acid (4.83 ± 1.04) in control group andFBS (148.59 ± 78.01), HbA1c(9.04 ± 1.98), uric acid (7.45 ± 0.37)in study group.*
Conclusion: *Early estimation of both the parameters should be done as increasedserum uric acid was seen with reduced glucose tolerance while monitoring case of diabetes and it helps to decrease the incidence of renal complications.*
Keywords:*Uric Acid, Diabetes mellitus, Glycated Haemoglobin*

I. Introduction

Number of people with diabetes mellitus has increasing rapidly worldwide, and it is one of the most important public health challenges to the country. The causes of the diabetes mellitus are multifactorial including lifestyle factors and genes. Glycated haemoglobin (HbA1c) a marker of chronic hyperglycaemia, its complications and it is a diagnostic test. It is an indicator for average blood glucose level over the period of 2-3 months.

Uric acid is an end product of the purine metabolism is associated with an increased future risk of diabetes; it may reduce the future risk of gout through the uricosuric effect of glucose or the impaired inflammatory response.

The present study was undertaken to compare the levels of HbA1c and serum uric acid in patients with newly diagnosed diabetes mellitus with normal healthy individuals.

II. Methods

This is a cross sectional study and was undertaken in the Central Laboratory, M.G.M Medical College & Hospital, Jamshedpur, Jharkhand, India during January 2016 to December 2016. Total 200 subjects included in this study (Group I: 100 normal healthy individuals, who were in the age group 30-80 years, of either sex. Group II: 100 patients of diabetes mellitus in the same age group). Means ± standard deviation were calculated and student t-test was applied to find out significance level. Informed and written consents were taken from all the subjects who were included in the study. Fasting blood samples were drawn and investigated for uric acid, blood sugar and HbA1c and were analysed on semi auto analyser machineand values compared with normal healthy subjects.

III. Results

The mean age of the cases and controls were 56.48 ± 12.53years (with 72 males and 28 females) and 54.72 ± 12.32 years (with 79 males and 21 females) respectively which was statistically insignificant (Table 1). The maximum number of patients was in the age group of 41- 50 i.e. 45% (Table 2). Mean serum levels of FBS, HbA1c, , uric acid were 86.71 ± 10.22, 4.93 ± 0.53, 4.83 ± 1.04 in controls (group-I) and 148.59 ± 78.01, 9.04 ± 1.98, 7.45 ± 0.37 in cases (group-II) respectively. The results indicates there is a statistically significant difference between the two groups

Table 1: Showing the comparison in the genderbetween the two groups.

SEX	GROUP 1	GROUP 2
MALE	72	79
FEMALE	28	21
TOTAL	100	100

Table 2: Showing the age distribution between the two groups.

AGE IN YEARS	GROUP 1	GROUP 2	TOTAL
30-40	10	16	26
41-50	50	45	95
51-60	20	19	39
61-70	10	12	22
71-80	08	08	16
>80	02	00	02
TOTAL	100	100	200

IV. Discussion

In the present study, it was observed that the FBS levels of cases were significantly higher than that of controls. In our study the mean HbA1c levels for controls is 4.93 ± 0.53 and for diabetic cases is 9.04 ± 1.98. HbA1c levels are significantly raised in Type 2 diabetic cases when compared with the controls. Several studies reported that there is a positive correlation between HbA1c and the duration of diabetic mellitus and a strong predictor of risk for diabetes complications. Use of HbA1c play a major role in case finding, in hospitalized patients with random hyperglycaemia as it does not require fasting, necessitates fewer blood draws, unaffected by recent food intake or recent change in blood sugar levels.

The Rancho Bernardo Study showed that hyperuricaemia has been associated with insulin resistance and is an independent predictor of incident type 2 diabetes in general populations. One of the possible causes is the defect in urate transporter which is responsible for urate reabsorption from kidney leading to increased uric acid levels in diabetes mellitus.

V. Conclusion

In conclusion, our study suggests that there is Increased serum uric acid was seen with reduced glucose tolerance hence early estimation of both the parameters should be done while monitoring case of Type-2 diabetes and thus will help to decrease the incidence of renal complications.

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