



CORRELATION OF SERUM URIC ACID WITH GLYCATED HEMOGLOBIN AND FASTING BLOOD SUGAR AMONG TYPE2 DIABETES MELLITUS

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ABSTRACT **Aim :** The study is to determine the association of Serum uric acid(SUA) with Glycated hemoglobin(HbA1c) and Fasting blood sugar in type 2 diabetes mellitus.

Materials and methods : A total of 50 cases aged >35yrs were selected randomly for one year study from Government General Hospital , Kurnool with exclusion criteria (hepatic, renal, cardiac impairment and gestational diabetes mellitus and who is on insulin therapy). FBS and SUA were done on Transasia erba chem 5x except HbA1C done on Nycocard analyzer.

Results : The mean values of SUA, HbA1c and FBS for diabetics were high. The p value is <0.0001 and is considered highly significant and the study found a good correlation between SUA with HbA1c and FBS in Type2DM.

Conclusion : As there is a positive correlation between SUA with HbA1c and FBS, uric acid has adverse effect on glycemic control in type2DM.

KEYWORDS : Uric acid , HbA1c, Type 2 DM.

INTRODUCTION

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia or insufficiency in the secretion or action of endogenous insulin. The global prevalence of diabetes has been growing rapidly from 382 million in 2013 to an estimated to about 592 million in 2035¹. Many previous studies have linked between uric acid and glycated hemoglobin in diabetes, as glycated hemoglobin is routinely used to monitor diabetes control.

Glycated hemoglobin(HbA1c) is primarily measured to be identify the average plasma glucose concentration over prolong period of time i.e 8-12 weeks. In 2009, the international expert committee includes the representatives of american diabetes association(ADA), International diabetes federation (IDF) and European association for the study of diabetes (EASD) recommended that HbA1c > 6.5% should be used to diagnose diabetes², which was subsequently adopted by ADA in 2010³. Serum uric acid (2,6,8- trihydroxy purine) is the major end product of purine metabolism. Several studies have been conducted on association of uric acid with fasting blood sugar since from 1923^{4,5}. Recently elevated uric acid levels are considered as independent risk factor for vascular diseases but this relationship unclear among diabetes individuals⁶⁻⁹. The third national health and nutrition examination survey (1988-1994) recorded that serum uric acid levels increased with moderately increasing levels of HbA1c (6-6.9%) and decreased with further increasing of HbA1c (a bell shaped changes)¹⁰. Therefore this study is aimed to evaluate the association between UA and HbA1c in Type2DM.

MATERIALS AND METHODS:

A total of 50 cases(duration of diabetes 5 years) aged >35yrs were selected from Government General Hospital , Kurnool with exclusion criteria (hepatic, renal, cardiac impairment and gestational diabetes mellitus and who is on insulin therapy). Blood samples were collected and estimated for Serum uric acid (SUA) by Uricase method, Fasting blood sugar (FBS) by Glucose oxidase-peroxidase method (GOD-POD) and Glycated hemoglobin (HbA1c) by Borate affinity immunoturbidometric method.

The data were statistically analyzed using Graph pad. The student T test was used to determine the association between Serum uric acid with HbA1c and FBS levels. A p value <0.05 was considered statistically significant.

RESULTS

The mean and SD of serum uric acid level was 6.24±1.19 and the mean and SD of HbA1c were 8.21±0.64 and the p value between the SUA and HbA1c is <0.0001 which is statistically significant . The mean and SD of FBS level was 166.22 and the p value between the SUA and FBS is <0.0001 which is statistically significant.

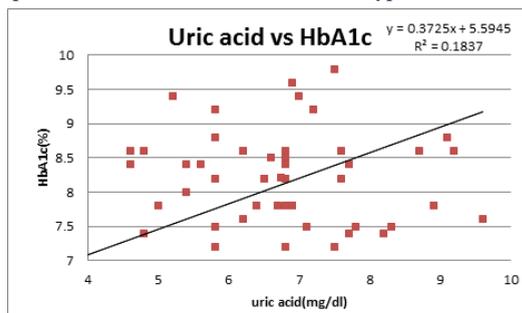
Table 1 and Graph 1,2 shows a correlation between SUA with HbA1c

and FBS in type 2 DM.

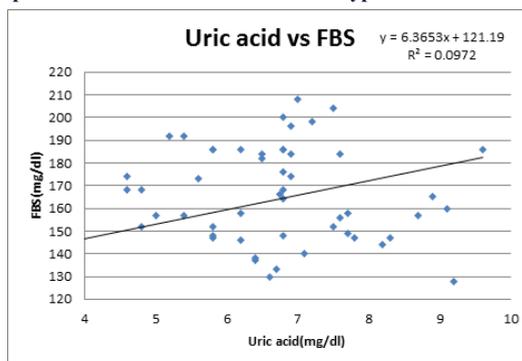
Table 1 : Correlation of SUA with HbA1c and FBS in type2DM

Correlation in parameters	p value	r value
SUA VS HbA1c	<0.0001	0.4277
SUA VS FBS	<0.0001	0.3114

Graph 1- Correlation of SUA with HbA1c in type2DM



Graph 2- Correlation of SUA with FBS in type2DM



DISCUSSION:

Many previous studies have linked SUA and HbA1c in type2DM which are uncertain to show to association of SUA and HbA1c in type2DM. Some studies have observed in increase uric acid levels in type 2 diabetes mellitus and our study found that there is an association of uric acid with HbA1c and FBS in the diabetes mellitus. Research done by yuliang cui et al., and fengjiang et al., shows inverse correlation between uric acid and HbA1c in newly diagnosed diabetes mellitus⁽¹¹⁻¹²⁾. As my study includes duration of diabetics 5 yrs , this should be accompanied by measuring the serum uric acid levels as they rises with duration and progression of disease and shows bell shaped changes.

CONCLUSION :

Based on understanding the previous studies in showing unclear relation between uric acid with HbA1c and FBS in type 2 DM, our study shows a good association between these three parameters in type 2 DM patients. This study indicates the importance of screening these parameters in all the subjects in rising the incidence of type 2 diabetes mellitus

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