



ORIGINAL RESEARCH PAPER

Pathology

GENDER DIFFERENCE OF HYPERURICEMIA IN PATIENTS SUFFERING FROM TYPE 2 DIABETES MELLITUS.

KEY WORDS: Gender; Hyperuricemia; Diabetes mellitus.

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ABSTRACT

Aims—We aimed to evaluate the gender difference of Hyperuricemia among patients of type 2 diabetes mellitus in a retrospective chart review.

Methods— : It was a retrospective chart review study, all documents either as hard copy or electronically stored of diagnosed cases of type 2 diabetes mellitus were assessed for inclusion – exclusion criteria, and on qualification their small Socio-demographic data sheet was filled up and available lab reports were recorded in tabulated form.

Results—A total of 200 subjects were included for the study, 129 patients (64.5 %) were male and 35.5% (n=71) were female. Based on serum uric acid estimation a total of 55 patients had hyperuricemic, that consisted of 27.5% of the total sample size. On group comparison across gender groups, there was significant difference on uric acid level and fasting blood sugar level.

Conclusions— This study finds that patients with type 2 diabetes mellitus, an increased UA level was associated with female gender than males.

INTRODUCTION

Hyperuricaemia (HU) is a biochemical entity that found to be associated with cardiovascular risk factor, renal and metabolic diseases [1,2]. HU can be defined as a condition in which individuals have serum levels of uric acid concentration is greater than 5.5 mg per deciliter(mg/dl) for children and greater than 7.2 and 6.0 mg/dl respectively for both male and female adults. Uric acid is a final enzymatic product in the degradation of purine nucleotides and it has the ability to scavenge oxygen radicals and protect the erythrocyte membrane from lipid oxidation [3,4].

Uric acid levels tend to decrease with increasing plasma glucose levels in patients with type 2 diabetes mellitus (T2DM) [5]. The prevalence of hyperuricemia in patients with T2DM is high. Gender difference is known for serum uric acid (UA) level, as women usually have a lower UA level than men. The impact of UA differential level can be reflected by the association in the general population between serum UA and cardiovascular events [6]; Metabolic syndrome [7]; worst prognosis with myocardial infarction [8], is reported to be stronger in females. Hence we aimed this study is to investigate the gender difference in serum uric acid level among patients of type 2 diabetes mellitus in our population.

MATERIALS AND METHOD

This study was conducted at department of medicine and pathology at a tertiary care medical college hospital of Jharkhand, India. It was a retrospective chart review study covered over a period of six months duration (January 2018 – June 2018). This study was designed as a non interventional, retrospective study. Data was retrieved from Medical record department for last six months duration. All documents either as hard copy or electronically stored of diagnosed cases of type 2 diabetes mellitus were assessed for inclusion – exclusion criteria, and on qualification their small Socio-demographic data sheet was filled up. All the subject records for which diagnosis of type 2 diabetes was documented and their serum uric acid estimation was performed and results were available were included in the study while the subject records with incomplete information were excluded from the study.

Statistical Analysis:

The collected data of all patients was statistically analyzed, using Statistical Package for Social Sciences (SPSS, Inc., Chicago, Illinois) version 10.0. Data analysis included means and standard deviations for complete sample. Frequency analysis was used to determine the prevalence of hypothyroidism. The parametric t-test was used to determine if differences existed between the groups. Statistically significant levels are reported for p values less than or equal to 0.05. Highly significant levels are p values less than .001.

RESULTS

A total of 200 subjects were included for the study, Table 1 summarizes the sample characteristics. Among the total sample size of 200 patients 129 patients (64.5 %) were male and 35.5% (n=71) were belonging to female gender. Finally based on serum uric acid estimation a total of 55 patients had hyperuricemic, that consisted of 27.5% of the total sample size. (Table -1). We categorized the data on the basis of gender, the two group consisted of 129 males and 71 female patients. The mean age of the sample was 54.47 ± 7.51 years and 54.15 ± 7.34 years respectively (t= .289 ; df= 198; p = .773). The mean Post prandial blood sugar was 154.15 ± 12.54 and 156.99 ± 12.00 respectively for male and females, (t= -1.552; df= 198; p = .122). The mean Hb1Ac were 6.75 ± 1.03 and 6.71± 1.00 for male and females respectively (t= .237; df= 198; p = .813). (Table -1)

Means of all continuous variables were compared for gender by independent t test, result (table -1) shows significantly higher fasting blood sugar for males (135.91 v± 12.79 vs 129.54 ± 10.56 v; t = 3.582, p= .000) and serum uric acid level were (7.10 ± 1.48 vs 6.39 ± 1.31) respectively for females and male patients (t= -3.490, df= 198, p= .001).

DISCUSSION

In this retrospective chart review study, we attempted to find hyperuricemia among type 2 diabetes mellitus and to compare the serum UA level across gender. We found a 27.5 % prevalence of hyperuricemia among diagnosed patients of type 2 diabetes mellitus. We also found that female gender showed higher serum UA level in comparison to males in our sample.

An earlier study reported prevalence of hyperuricemia 36.1% and 28.3% respectively for women and men [9],

Hyperuricemia is considered as independent risk factor for type 2 diabetes mellitus and hypertension, as suggested by few studies, They further suggests that lowering the Serum Uric Acid levels in fact decreases the risk of these diseases. The suggested mechanism involves endothelial dysfunction by elevated Serum Uric Acid levels, which lead to reduced insulin-stimulated nitric oxide-induced vasodilatation in skeletal muscle, resulting in reduced glucose uptake in skeletal muscles. Hence, screening of Serum Uric Acid levels may be used as indicator for onset or progression of diabetes and hypertension [10].

Studies suggests that in addition to type 2 diabetes mellitus, hypertension, elevated levels of serum UA have been also associated with an increased risk for dyslipidemia, metabolic syndrome, hyperinsulinemia, gout, stroke, atherosclerosis, chronic kidney disease, congestive heart failure, obesity, coronary artery disease and stroke [11-14].

Our study has few limitations. First, it was not a prospective study, but a retrospective analysis of data collected from ongoing OPD. Hence, the scope of finding the association between the SUA levels and different patient characteristics, was limited. Second, there was no healthy control group, which limited the ability to compare the SUA levels between patients of diabetes and healthy individuals.

In future we also need larger samples size, prospective design studies, along with a matched control group, simultaneous assessment of other biochemical parameters, and burden of various other metabolic problems, and follow-up studies to know the longitudinal course of these problems.

CONCLUSION

In conclusion, the results suggest that among patients with type 2 diabetes mellitus, an increased UA level was associated with female gender then male gender.

Table 1. Sociodemographic and clinical features of the sample (n=200)

	Gender	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Age	Male	54.47	7.51	.289	198	.773
	Female	54.15	7.34			
FBS	Male	135.91	12.79	3.582	198	.000
	Female	129.54	10.56			
PPBS	Male	154.15	12.54	-1.552	198	.122
	Female	156.99	12.07			
Hb1AC	Male	6.75	1.03	.237	198	.813
	Female	6.71	1.00			
Uric Acid	Male	6.39	1.31	-3.490	198	.001
	Female	7.10	1.48			

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