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Original Research Paper

Pathology

A RETROSPECTIVE STUDY ON PREVALENCE OF HYPERURICEMIA IN PATIENTS SUFFERING FROM TYPE 2 DIABETES MELLITUS.

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ABSTRACT

Aims—We aimed to evaluate the prevalence 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 hyperurecemic, that consisted of 27.5% of the total sample size. On group comparison between non hyper uricemia and hyper uricemic group but there was no siginificant difference on diabetic parameters.

Conclusions—This study finds a prevalence of 27.5 % of hypothyroidism among diabetes mellitus.

KEYWORDS : Words: Prevalence; Hyperuricemia; Diabetes mellitus.

INTRODUCTION

Hyperuricemia is a condition in which individuals have higher levels uric acid concentration in the serum or when serum levels of uric acid concentration is greater than the upper normal reference limits particularly 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 [1,2].

Hyperuricemia has recently gained attention as it has been reported that it not only plays an important role in the development of metabolic diseases but is also a cardiovascular risk factor [3-6]. Uric acid levels tend to decrease with increasing plasma glucose levels in patients with type 2 diabetes mellitus (T2DM) [7]. The prevalence of hyperuricemia in patients with T2DM is high. Ogbera et al reported a 25% prevalence of hyperuricemia in Nigerian patients with T2DM [8]. The main aim of the current study was to determine the prevalence of hyperuricemia in T2DM patients.

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. Patients with SUA levels > 7 mg/dL were considered as hyperuricaemic in this study.

Socio-demographic Data Sheet: The socio demographic data sheet included age, religion, occupation, education and clinical information like duration of diabetes and other medical history.

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.

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 absence of hyper uricemia (Group A) or presence of hyper uricemia (Group B), the two group consisted of 145 and 55 patients respectively. The mean age of the sample was 53.99 ± 7.54 years and 55.32 ± 7.14 years respectively (t= 2.017; df= 198; p = .045). The mean fasting blood sugar was 134.73 ± 12.87 and 130.80 ± 10.66 respectively (t= -1.133; df= 198; p = .258); Post prandial blood sugar was 155.12 ± 12.61 and 155. 52 ± 12.00 respectively (t= -.070; df= 198; p = .945). The mean Hb1Ac for the both groups were 5.90 ± 1.11 and 6.80 ± 0.74 (t= -.666; df= 145.44; p = .506). And obviously by default both groups were significantly different for uric acid level. (Table -1)

DISCUSSION

This is a retrospective chart review study, we found a 27.5 % prevalence of hyperuricemia among diagnosed patients of type 2 diabetes mellitus. The findings of the current study is in accordance to many previous studies. A study reported prevalence of hyperuricemia 36.1% and 28.3% respectively for women and men [9]

We found prevalence of hyperuricemia on slightly lower side of this range of these referenced studies, this may be due to various reasons like age, gender, food habits and sample's metabolic profile. The prevalence of hyperuricemia may also be affected by increasing age and gender as suggested by a few studies [10]. Other factors for found variation in prevalence may be attributable to sample selection and different lab test or different criteria used.

As we grouped sample as with presence of hyperuricemia and absence of hyperuricemia and attempted to examine the blood sugar level. We found slightly higher mean fasting blood sugar level among non hyperuricemia group then hyperuricemia group. However we did not find any difference in post prandial mean blood

sugar and mean Hb1Ac in these two groups.

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 infact 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 [11].

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. There should be attempt to determine if early screening of Serum Uric Acid levels may predict the chronic illness like type 2 diabetes and hypertension and early preventive interventions can be considered.

CONCLUSION

This study finds a prevalence of 27.5% of hyperuricemia in type 2 diabetes mellitus patients.

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

		n	%		
Gender	Male	**129**	**64.5**		
	Female	**71**	**35.5**		
Hyperurecemia	Absent	145	72.5		
	present SUA above 7	55	27.5		
	Non Hyper urecemia (n= 145)	**Hyper urecemia (n= 55)**	**t test**	**df**	**p value**
Age	53.99 ± 7.54	55.32 ± 7.14	2.017	198	.045
Fasting Bld Sugar	134.73 ± 12.87	130.80 ± 10.66	-1.133	198	.258
PP Bld Sugar	155.12 ± 12.61	155. 52 ± 12.00	-.070	198	.945
Hb1Ac	5.90 ± 1.11	6.80 ± 0.74	-.666	145.44	.506
Uric Acid	5.90 ± 0.68	8.62 ± 0.79	-22.507	86.43	.000

REFERENCES

1. Feig DI, Kang DH, Johnson RJ. Uric acid and cardiovascular risk. N Engl J Med. 2008;359:1811–21.
2. Lia C, Hsiehb MC. Chang SJ. MetS, diabetes, and hyperuricemia. 2013;25:210–6.
3. Nakagawa T, Cirillo P, Sato W, Gersch M, Sautin Y, Roncal C et al. The conundrum of hyperuricemia, metabolic syndrome, and renal disease. Intern Emerg Med. 2008;3:313-8.
4. Cai Z, Xu X, Wu X, Zhou C, Li D. Hyperuricemia and the metabolic syndrome in Hangzhou. Asia Pac J Clin Nutr. 2009;18:81-7.
5. Takahashi MM, de Oliveira EP, de Carvalho AL, de Souza Dantas LA, Burini FH, Portero-McLellan KC et al. Metabolic syndrome and dietary components are associated with coronary artery disease risk score in free-living adults: a cross-sectional study. Diabetol Metab Syndr. 2011;3:7.
6. Chen JH, Chuang SY, Chen HJ, Yeh WT, Pan WH. Serum uric acid level as an independent risk factor for all-cause, cardiovascular, and ischemic stroke mortality: a Chinese cohort study. Arthritis Rheum. 2009;61:225-32.
7. Nan H, Dong Y, Gao W, Tuomilehto J, Qiao Q. Diabetes associated with a low serum uric acid level in a general Chinese population. Diabetes Res Clin Pract. 2007;76:68-74.
8. Ogbera AO, Azenabor AO. Hyperuricaemia and the metabolic syndrome in type 2 DM. Diabetol Metab Syndr. 2010;2:24.
9. J Wang, RP Chen, L Lei, QQ Song, RY Zhang, YB Li, et al., Prevalence and determinants of hyperuricemia in type 2 diabetes mellitus patients with central obesity in Guangdong Province in China. Asia Pac J Clin Nutr 2013;22(4):590-598.
10. Culleton BF, Larson MG, Kannel WB, Levy D. Serum uric acid and risk for cardiovascular disease and death: the Framingham Heart Study. Ann Intern Med 1999; 131:7-13.
11. Fouad M, Fathy H, Zidan A. Serum uric acid and its association with hypertension, early nephropathy and chronic kidney disease in type 2 diabetic patients. J Bras Nefrol 2016; 38:403-10.