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Research Article

**ASSOCIATION BETWEEN LEVELS OF URIC ACID
IMBALANCE TOLERANCE TO GLUCOSE IN THE PATIENTS
SUFFERING FROM METABOLIC SYNDROME**¹Dr. M. Zaheer Abbas, ²Dr Rabia Babar, ³Dr Muhammad Ilyas¹Services Hospital Lahore, ²Services Institute of Medical Sciences, ³Allama Iqbal Memorial Teaching Hospital Sialkot.**Article Received:** August 2019**Accepted:** September 2019**Published:** October 2019**Abstract:**

Objective: The clustering of the risk factors of cardio-metabolism is Met-S (Metabolic Syndrome). Elevated level of uric acid in serum are very common in the patients suffering from CVDs holding various attributes of the Met-S. The part played uric acid in the pathogenesis of Met-S and there was no understanding for the diabetes type-2 development. In this research work, association between the level of uric acid in serum and criteria of Met-S and the study of the OGTT (Oral Glucose Tolerance Test) outcome carried out.

Methodology: This research work conducted on 70 patients present with minimum 3 Met-S identification standard recommended by international definitions. After the collection of the twelve hour fasting samples of blood venous blood of the patients, two hour OGTT performed with seventy five gram oral glucose. The level of glucose between one hundred and forty & one hundred and ninety nine mg/dl at hour second was the as imbalance to tolerance to glucose.

Results: The two hours' value of glucose of 23 patients (29.0%) out of 70 patients was determined to be one hundred & forty mg/dl and over. In the analysis of linear regression, we discovered level of uric acid and circumference of waist, BMI and levels of two hour OGTT were present with relationship.

Conclusion: In this research work, patients present with high risk of type-2 diabetes, we discovered that the levels of uric acid were present with relation to some components of the Met-S. The concentration of the uric acid had no impact on basal glycaemia & sensitivity of insulin.

Keywords: Met-S, Glucose, Circumference, Diabetes, Concentration, Waist, Uric Acid, Glycaemia, Insulin, Sensitivity.

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INTRODUCTION:

The cluster of the metabolic anomalies is Met-S described as the cluster of different risk factors of CVDs in single person including obesity, HTN (Hypertension), hypertriglyceridemia, low level of HDL-C (High Density Lipoprotein-Cholesterol) and IGT (Impaired Glucose Tolerance). Impaired glucose tolerance is very vital step in the natural development of the type-2 diabetes. The patients having impaired tolerance to glucose have high risk to acquire type-2 diabetes and CVDs development, therefore they made an important target group in basic prevention of the issue. This is well establishing view that there is association between the levels of uric acid in serum and condition of cardiovascular state, consisting HTN, diseases of coronary artery, Met-S, kidney diseases and preeclampsia.

Increase in the evidences proposes that there is very important role of uric acid in Met-S and some professionals and experts of this field have provided proofs for the inclusion of the raised uric acid in serum with impaired clearance of kidneys as a Met-S component. In current research work, the study of the association between bio-chemical indices and levels of uric acid carried out in the patients present with high risk for the development of type-2 diabetes.

METHODOLOGY:

Total 70 patients suffering from the metabolic syndrome who got admission in the outpatient department of the Services Hospital Lahore were the part of this research work. There was requirement of the availability of the minimum 3 criteria according to the definitions of proposals of NCEP-ATP Panel-3, BP 130-85 mmHg or the usage of the anti-hypertensive agents, fasting glucose level of plasma greater than 110 mg/dL. or utilization of the medicines of antibiotics; fasting tri-glyceride as one hundred and fifty mg/dL; HDL-C less than forty mg/dL for males or fifty mg/dL for females & the circumference of the waist greater than 102 centimeters for men or greater than eighty eight centimeter for women.

Patients with DM greater than 126 mg/dl, utilization of anti-hypertensive, medicines for decreasing the

lipids or using the drugs to affect the levels of uric acid; having treatment for replacement of hormone; patients with hypothyroidism; pregnant females and patients of kidney and heart diseases were not the part of this research work. We obtained the consent of every patient after the approval of the ethical committee of the hospital. We gathered the complete medical history of the patients after their physical examination. We calculated the BMI of the patients with the use of the standard formula. We carried out the calculation of the circumference of waist in standing position of every patient. We also noted the BP of every patient in sitting position with the utilization of the mercury device for BP. We performed the OGTT with seventy five gram oral glucose after gathering the fasting samples of blood from every patient. IGT was defined as the glucose level from 199 to 140 mg/dl.

The assessment of the sensitivity of the insulin carried out with the utilization of the HOMA-IR (Homeostasis Model Assessment of Insulin Resistance). We also calculated the insulin resistance with the utilization of the standard formula. In current research work, Graph Pad Prisma Version-3 was in use for the statistical analysis of the collected information. Association between level of uric acid and determination of the variables carried out with the utilization of the regression analysis.

RESULTS:

A sum of total 70 patients followed for Met-S discovery having eighteen year of age of more (50 females, average age: 49.8 ± 7.48 ; 20 males, average age: 48.8 ± 12.18) were the part of this research work. In accordance with the results of OGTT, 67.0% patients were available with normal tolerance of glucose and 29.0% patients were present with IGT. The value of OGTT greater than 140 & less than 140 among groups, circumference of waist, DBP, SBP, body mass index, fasting plasma glucose, uric acid, insulin, HOMA-IR, HDL-C and triglyceride were present with no strong association. The value of OGTT 1-hour greater than 140 was much greater in the patients of group of IGT (Table-1).

Table-I: Distribution of Subjects With Met S By OGTT Results

Parameters	>140 (n=20)	<140 (n=50)	t	P
	Mean \pm SD	Mean \pm SD		
Age (year)	50.2 \pm 8.6	48.1 \pm 8.2	0.568	0.4238
SBP (mmHg)	146.6 \pm 14.7	146.3 \pm 14.7	0.068	0.9278
DBP (mmHg)	93.4 \pm 4.7	93.2 \pm 6.3	0.98	0.9048
BMI (kg/m ²)	31.1 \pm 3.2	31.2 \pm 2.5	0.088	0.9068
WC (cm)	96.1 \pm 5.6	96.2 \pm 4.6	-0.048	0.9398
FPG (mg/dl)	111.0 \pm 5.7	108.2 \pm 7.2	1.28	0.197
Uric acid (mg/ dl)	4.4 \pm 1.3	2.6 \pm 1.3	-0.778	0.3108
HDL-C (mg/ dl)	45.6 \pm 6.6	44.4 \pm 10.2	0.258	0.6238
Triglyceride (mg/ dl)	142.6 \pm 72.5	178.3 \pm 113.2	-1.218	0.1388
Insulin (pU/ ml)	9.2 \pm 3.0	10.1 \pm 3.2	-0.338	0.5738
OGTT 1-hour	104.4 \pm 8.2	94.6 \pm 10.7	3.148	0.0008
HOMA-IR	3.2 \pm 1.3	3.3 \pm 1.3	-0.198	0.8238
Triglyceride/ HDL-C	3.1 \pm 1.5	4.2 \pm 3.1	-1.528	0.0668

The determination of the levels of uric acid with the Met-S & IGT carried out with the performance of regression analysis. The levels of the uric acid were present with an association with the circumference of the waist, value of OGTT 2-hour and body mass index as elaborated in Figure-1.

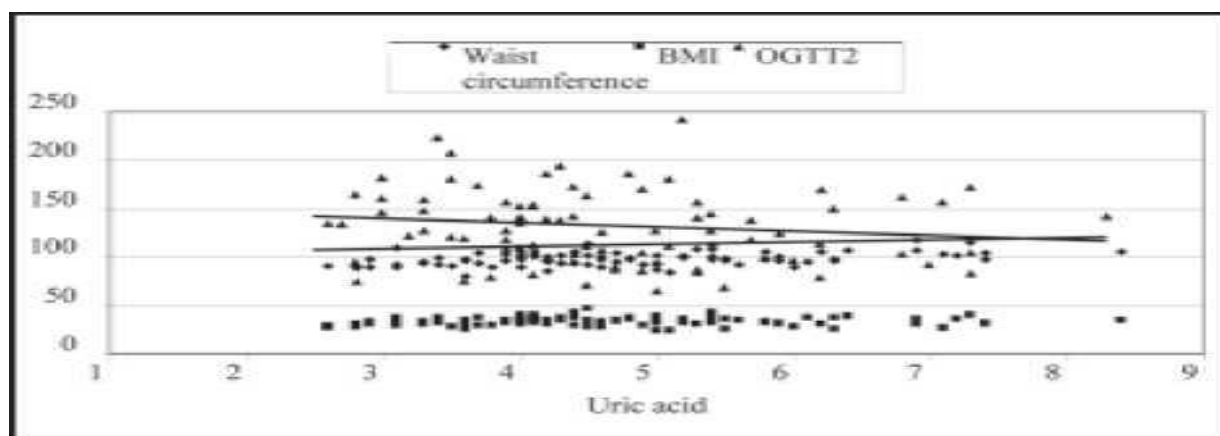


Figure 1

DISCUSSION:

There is an association of the Met-S with the high rate of mortality and morbidity in cardiovascular complications. Many epidemiological research work have showed that the raised levels of uric acid were the main risk factors for the high mortality rate due to cardiovascular complications, but it is still unclear phenomena. Among patients present with high risk of Met-S, the determinative factor to develop the Type-2 diabetes is the uric acid. As a factor of risk for Met-S & cardiovascular diseases, the increase of the glucose after the OGTT test discovered to be loftier than the glucose level of fasting plasma for the determination of the insulin resistance. IGT appears with a pre-diabetic condition situated between tolerance to

normal glucose & diabetes, supposed to make persons in this condition extremely vulnerable to the atherosclerotic anomalies. The epidemiological research works on very large scale, hyperuricemia is the reason of the high prevalence of CVDs and high rate of mortality for the patients of CVD.

In a prospective research work conducted by Kekalainen, he found that whereas levels of uric acid, dyslipidemia & hypertension have an association with the insulin resistance, very LDL-C & hypertension were present to have an association with reduced 1st phase secretion of insulin. The levels of the normal uric acid do not show the average sensitivity of insulin. In current research work, we observed a strong

association between the levels of uric acid & value of OGTT 2-hour, basal glycaemia & sensitivity of insulin were present with no influence. In research work of CARDIA, ten-year alteration in the uric acid of serum & its relationship to make changes in some other metabolic factors of risks underwent evaluation for adult patients.

One other important risk factor linked with the Met-S and Type-2 diabetes in current years is obesity. In research works carried out with youngsters, the results showed that high value of body mass index has an association with the hyperuricemia. The raised levels of leptin have association with the resistance to insulin in early Type-2 diabetes and Met-S. Bedir A confirmed that leptin is very important determiner in the association between hyperuricemia & fatness. Additionally, fat acids & hypertriglyceridemia were present to have association with the hyperuricemia autonomous from deposition of the central body fat as well as fatness. Our current research work showed that the level of uric acid has very strong association with the obesity, particularly the fatness of the abdomen cavity.

CONCLUSION:

The findings of this research work showed that in the patients with Met-S with impaired glucose tolerance and obesity, therapy & assessment of the levels of uric acid appear to be approach that is very beneficial for the prevention of the atherosclerotic cardiac abnormalities.

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