



A STUDY OF CORRELATION BETWEEN GAMMA GLUTAMYL TRANSFERASE AND METABOLIC SYNDROME

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ABSTRACT **CONTEXT:**The metabolic syndrome (Syndrome X, or insulin resistance syndrome) is a combination of several risk factors that contribute to atherosclerotic cardiovascular disease (ASCVD). Elevated blood pressure, triglycerides, hyperglycemia, waist circumference and low HDL- cholesterol are all symptoms of accelerated dyslipidemic atherogenesis. Glutaryl transferase (GGT) has long been thought to be a biomarker for hepatic and biliary illness and alcoholic related disease. GGT is required for the extracellular catabolism of glutathione, which is the most important thiol antioxidant in humans.It co localizes with oxidised low density lipoprotein (LDL) and foam cells in the atheromatous core of coronary plaques. GGT can be a proinflammatory sign. GGT was found to be a prognostic marker for Metabolic syndrome, CVD, and heart failure .**AIM:** Study of Gamma glutamyltransferase in metabolic syndrome patients. **MATERIALS AD METHODS:** A sample size of 100 patients admitted in medicine and other departments in nri general hospital are included in study **STATISTICAL ANALYSIS:** Qualitative data was expressed in frequencies and percentages and Quantitative data in mean and standard deviation. Non parametric statistics i.e. Chisquare test was used to find the significant association between the two qualitative variables. Independent t test and ANOVA were used to find the statistical significance between quantitative variables. Pearson correlation coefficient was used to find correlation between two variables. p value of <0.05 was considered statistically significant. **CONCLUSION:** It should be highlighted that elevated levels of GGT are not the only hepatic biomarker of hepatic steatosis, as evidenced by findings from several research. Lines of evidence point to a link between high GGT levels in the blood and the metabolic syndrome. As a result, higher GGT levels are associated with increased insulin resistance and a higher risk of type 2 diabetes .

KEYWORDS : METABOLIC SYNDROME,CVD RISK,GGT,INSULIN RESISTANCE

INTRODUCTION

metabolic syndrome (MetS, Syndrome X, or insulin resistance syndrome) is a grouping of cardiovascular risk factors that contribute to atherosclerotic cardiovascular disease (ASCVD). High blood pressure, triglycerides, hyperglycemia, prothrombotic and proinflammatory conditions, and low HDL- cholesterol are all symptoms of atherogenic dyslipidemia. Metabolic syndrome is linked to a 2-fold increase in the risk of cardiovascular disease and a 5-fold increase in the risk of diabetes. Glutaryl transferase (GGT) has long been thought to be a biomarker for hepatobiliary illness and alcoholism. GGT is required for the extracellular catabolism of glutathione, which is the most important thiol antioxidant in humans. GGT increases cysteine availability, promoting intracellular glutathione (GSH) resynthesis and reducing oxidative stress. It colocalizes with oxidised low density lipoprotein (LDL) and foam cells in the atheromatous core of coronary plaques. Because it mediates the interconversion of the glutathione-containing inflammatory mediator leukotriene C4 into leukotriene D4. GGT can be a proinflammatory sign. GGT was found to be a prognostic marker for MetS, CVD, and heart failure in a review article by Malnick et. al

AIM: Study of Gamma glutamyltransferase in metabolic syndrome patients.

OBJECTIVES OF THE STUDY: 1. To study the correlation between GGT and metabolic syndrome 2. To assess the sensitivity and specificity of GGT in diagnosis of metabolic syndrome

CASE STUDY:

This is a cross sectional descriptive study conducted in Nri medical college ad general hospital with sample size 100

DURATION: 18 months

INCLUSION CRITERIA

1. Patients aged above 18 years
 2. Diagnosed case of metabolic syndrome
- ATP III criteria define metabolic syndrome as the presence of any 3 of following five traits

a. Abdominal obesity, defined as waist circumference > 102 cm in men and > 88 cm in women

b. Serum triglycerides $\geq$ 150 mg/dl or drug treatment for elevated triglycerides

c. Serum HDL cholesterol < 40 mg/dl or drug treatment for low HDL cholesterol d. Blood pressure > 130/85 mm Hg or drug treatment for elevated blood pressure

e. Fasting plasma glucose > 100 mg/dl or drug treatment for elevated blood glucose

EXCLUSION CRITERIA:

- Patients with
- a. Hypothyroidism
 - b. Malignancy
 - c. Chronic alcohol consumption
 - d. Renal dysfunction
 - e. Acute and chronic liver disease

RESULTS:

Waist circumference

	Frequency	Percentage
80-90	22	22%
91-100	49	49%
101-110	21	21%
>110	8	8%
Total	100	100%

SBP

	Frequency	Percentage
120-139	23	23%
>140	77	77%
Total	100	100%

FBS:

	Frequency	Percentage
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<100	8	8%
100-126	7	7%
>126	85	85%
	100	100%

TRIGLYCERIDES:

	frequency	Percentage
<150	25	25%
150- 500	73	73%
>500	2	2%
total	100	100%

HDL:

	frequency	percentage
<35	63	63%
35-60	34	34%
>60	3	3%
total	100	100%

GGT:

	frequency	percentage
<15	10	10%
15 - 21	26	26%
22 - 33	24	24%
>33	40	40%
Total	100	100%

DISCUSSION:

The metabolic syndrome, which includes insulin resistance, hypertension, glucose intolerance, hypertriglyceridemia, and low levels of high-density lipoprotein cholesterol (HDL-C), is a serious global public health issue. Atherosclerosis, diabetes, and cardiovascular disease are all increased by Metabolicsyndrome. Gamma-Glutamyl Transferase (SGGT) is an enzyme that contributes to the extracellular catabolism of glutathione (GSH) and is found on cell surfaces and in serum, however most serum GGT comes from the liver.[1.] Glutamyl transferase (GGT) is a clinical marker for a number of things, including alcohol use, plasma lipid/lipoproteins, and glucose levels, blood pressure, and metabolic syndrome. It's also linked to cardiovascular disease and mortality. It has been shown in rat lung epithelial cells that GGT expression becomes more apparent by oxidants, suggesting that increased GGT activity may be a marker for oxidative stress. These findings have been supported by other research, demonstrating that serum concentrations of GGT could be used as a marker for increased oxidative stress in humans. Accumulating data indicate that there is an association between serum GGT levels (within the normal range) and cardiovascular diseases. An Obesity and elevated GGT levels have {2} been linked. GGT elevation has been linked to nonalcoholic fatty liver disease, a manifestation of obesity. Several studies have found that high levels of GGT in the blood are a risk factor for the development of diabetes mellitus. A population-based study found a link between serum GGT levels and type 2 diabetes. diabetes mellitus. A population based study demonstrated a significant association between serum GGT levels and type 2 DM. {3-4} . Given the links between GGT and cardiovascular disease, we looked into the relationship between serum GGT activity and MetS. The present study was aimed, to study the levels of gamma glutamyl transferase in patients with metabolic syndrome” the objectives of the study being: To study the correlation between GGT and metabolic syndrome To assess the specificity and sensitivity of GGT in diagnosis of metabolic syndrome.

CONCLUSION: It should be highlighted that elevated levels of GGT are not the only hepatic biomarker of hepatic steatosis, as evidenced by findings from several research. Other lines of evidence point to a link between high GGT levels in the blood and the metabolic syndrome. As a result, higher GGT levels are associated with increased insulin resistance and a higher risk of type 2 diabetes. Another noteworthy link between GGT and the metabolic syndrome is the discovery that obese people, particularly those with abdominal obesity, have higher GGT levels. Higher GGT levels are linked to hypertension, extending the link between GGT and the metabolic syndrome. As a result, it appears that serum GGT increases are connected to all of the major components of the metabolic syndrome. The metabolic syndrome is essentially composed of a collection of atherogenic variables that typically cluster in people. Elevations in remnant lipoproteins, hyperglycemia, blood pressure, circulating inflammatory cytokines,

and prothrombotic factors, as well as low levels of high density lipoproteins, are among these (HDL). Certainly elevations in serum GGT belong on the list of biomarkers linked to the metabolic syndrome

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