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Comparisons of serum gamma glutamyltransferase with random blood sugar levels and gender in selected diabetic and non-diabetic individuals

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Background: Gamma glutamyltransferase (GGT) is the key enzyme for extracellular catabolism of glutathione and thereby it regulates the oxidative stress. GGT is suggested to be associated with pathological mechanism of type 2 diabetes mellitus (DM). An elevated serum GGT level indicates hepatic steatosis and visceral fat deposition leading to insulin resistance and diabetes. Studies emphasized that elevated circulating GGT levels have been associated with increased risk of pre-diabetes and type 2 DM. Studies also showed alterations of level of GGT distribution by gender as well.

Objective: To compare serum GGT with Random Blood Sugar (RBS) levels in non-diabetic and type 2 diabetic individuals and to determine the correlation of GGT and RBS with gender.

Method: A case control study was conducted with 147 subjects (n=72; controls/healthy subjects, n=75; cases/type 2 diabetics) between 20-60 years of age. Individuals were measured for RBS and serum GGT using a semi-automated clinical analyzer. A subgroup analysis was conducted classifying individuals according to RBS levels; diabetic (≥ 200 mg/dL), pre-diabetic (140-199 mg/dL) and normoglycaemic (<140 mg/dL).

Results: According to the RBS levels among subgroups, cases categorized into diabetic group (median GGT 26.8 U/L, interquartile range (IQR) 14.7-36.9 U/L) showed a significantly elevated serum GGT level (p=0.001) compared to normoglycaemic (15.7 U/L, IQR 11.8-23.2 U/L) and pre-diabetic group (17.2 U/L, IQR 12.3-23.7 U/L). Further, in controls, pre-diabetic subgroup (median GGT 29.2 U/L) had significantly higher (p=0.016) serum GGT levels compared to normoglycemic individuals (median GGT 14.2 U/L, IQR 12.3-19.4 U/L). GGT and RBS showed a significant positive correlation in female (r=0.30, p=0.002) and male (r=0.42, p=0.008) individuals respectively.

Conclusion: Increased serum GGT levels were associated with increased levels of glucose in type 2 diabetic as well as in non-diabetic healthy controls. GGT and RBS showed positive correlations in female and male individuals of the study population.