

Gamma-Glutamyl Transpeptidase (GGT) As A Marker In Obstructive Jaundice

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Citation

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Abstract

Introduction: GGT is a membrane-bound enzyme that occurs in many parenchymatous organs. But appreciable activity of it is only found in the kidneys, pancreas, liver, spleen, and small intestine. The serum level of this enzyme is almost invariably determined only by liver and bile duct disorders. Aim of this study was to estimate the serum level of GGT in patients of chronic cholecystitis with cholelithiasis and CBD obstruction.

Material and method: The study included 55 patients, of which 34 patients of chronic cholecystitis with cholelithiasis (Group I) and 21 patients of CBD obstruction (Group II). In CBD obstruction patients, 16 patients had CBD stone along with gallstones; three had malignant obstruction and two patient of lower CBD stricture. All patients were evaluated preoperatively with blood investigations and ultrasonography of the abdomen. Patients with liver, renal diseases and chronic alcoholics were excluded from the study.

Results: The mean serum concentration of GGT in Group I was 24.47 ± 6.09 IU/L while in Group II 546.29 ± 373.38 IU/L and difference was statistically significant ($p=0.000$). The serum concentration of total and direct bilirubin were significantly high ($p=0.000$) in Group II patients. There was no statistically significant difference in serum concentration of AST and ALT in both Groups ($p>0.05$).

Conclusion: Raised serum level of GGT can be used as a diagnostic marker in patients of CBD obstruction along with alkaline phosphatase.

INTRODUCTION

Gamma-glutamyl transferase (GGT), sometimes called gamma-glutamyl transpeptidase (GGT), is an enzyme that is compared with ALP levels to distinguish between skeletal disease and liver disease. Elevations of this enzyme occurs in a number of disparate clinical situations, including all manner of liver disease—fatty liver, viral hepatitis, bile duct obstruction, and most drug reactions involving the liver. Serum level of GGT in patients of chronic cholecystitis with cholelithiasis and CBD obstruction were estimated in this study.

MATERIAL AND METHODS

This prospective study was carried out on 55 patients admitted in the Surgical Unit of University Hospital, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India from March 2006 to July 2006. Out of 55 patients, 34 patients of chronic cholecystitis with

cholelithiasis and 21 of CBD obstruction. 16 patients had CBD stone along with gallstones, three had malignant obstruction and two patient had lower CBD stricture. The cases were distributed into two groups comprising 34 patients each of chronic cholecystitis with cholelithiasis (Group I) and common bile duct obstruction (Group). All patients were evaluated preoperatively with blood investigations and ultrasonography of the abdomen. Patients with liver, renal diseases, chronic alcoholics and on drugs like phenytoin, phenobarbital and oral contraceptives were excluded from the study.

RESULT

Mean age of patients of chronic cholecystitis with cholelithiasis was 32.44 with range of 23 to 45 years. Patients with CBD obstruction had a mean age of 41.96 years with age range of 22 to 61 years. The difference between mean age of Group I and Group II patients was statistically significant ($p=0.000$). The mean BMI of Group I

patients was 21.71 kg/m² while it was 21.43 kg/m² for Group II. The difference between the three groups was statistically not significant ($p > 0.05$). The mean CBD diameter was 4.76mm in Group I while 13.15mm in Group II and difference was statistically significant ($p = 0.000$). The mean serum concentration of GGT in Group I was 24.47 ± 6.09 IU/L while in Group II 546.29 ± 373.38 IU/L and difference was statistically significant ($p = 0.000$) (Table 1, Figure 1). The mean serum concentration of ALP in Group I was 246.85 ± 78.86 IU/L while in Group II 1045.57 ± 421.28 IU/L and difference was statistically significant ($p = 0.000$) (Table 1, Figure 2). The serum concentration of total and direct bilirubin were significantly high ($p = 0.000$) in Group II patients. There was no statistically significant difference in serum concentration of AST and ALT in both Groups ($p > 0.05$).

Figure 1

Figure 1: Serum GGT level

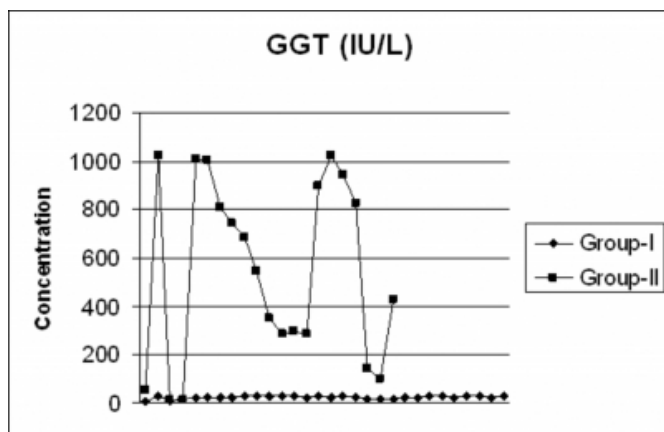


Figure 2

Figure 2: Serum alkaline phosphatase level

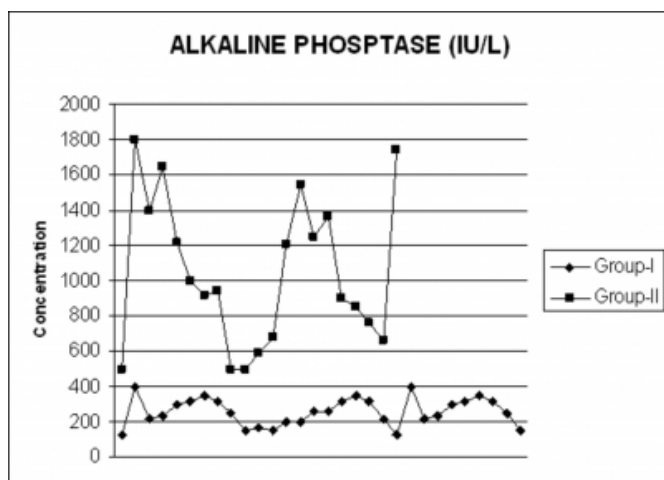


Figure 3

Table 1 : Data are expressed as mean (range) except where otherwise stated

Patients characteristics	Chronic cholecystitis with cholelithiasis	CBD obstruction	P -value
Total No.	34	21	
female	24	13	
male	10	8	
Age (years)	32.44 (23-45)	41.95 (22-61)	0.000
BMI(kg/m ²)	21.71(19.12-24.54)	21.43 (19.46-25.16)	>0.05
CBD diameter(mm)	4.76 (3.5-5.5)	13.15 (11-16.9)	0.000
GGT (IU)	24.47 (5-32)	546 (54-1022)	0.000
Alk. Phosphatase(IU)	246.85 (125-398)	1045.5712 (498-1800)	0.000
STB	1.09 (0.5-1.6)	8.57 (2.8-28.54)	0.000
SDB	0.48 (0.2-0.8)	4.16 (2.1-12.5)	0.000
AST	28.88 (25-38)	31.09 (26-40)	>0.05
ALT	29.76 (26-40)	30.90(28-35)	>0.05

DISCUSSION

GGT is a biliary enzyme that is especially useful in the diagnosis of obstructive jaundice, intrahepatic cholestasis, and pancreatitis.² GGT is more responsive to biliary obstruction than are aspartate aminotransferase (AST) (SGOT) and alanine aminotransferase (ALT) (SGPT). GGT is helpful to work up elevated alkaline phosphatase values and more specific for hepatic disease than is alkaline phosphatase. It is normal in most instances of renal failure.³ GGT has no origin in bone or placenta, unlike alkaline phosphatase, and age beyond infancy does not influence GGT levels. GGT is increased in systemic lupus erythematosus,⁴ and very high levels are common in primary biliary cirrhosis. High GGT is found in infants with biliary atresia and in chronic alcoholic patients. It is increased with hyperthyroidism and decreased in those with hypothyroidism.⁵ In the present study we have ruled out any liver pathology with USG abdomen, AST and ALT concentration. GGT and ALP levels were normal in patients of chronic cholecystitis with cholelithiasis but significantly high in patients of common bile duct obstruction along with total and direct bilirubin. Since GGT is more specific for biliary disease than ALP, so it increases the specificity of the diagnostic test used for CBD obstruction. Because GGT is not increased in bone disorders, as is ALP, a normal GGT with an elevated ALP would indicate bone disease. Conversely, because the GGT is more specifically related to the liver, an elevated GGT with an elevated ALP would strengthen the diagnosis of liver or bile-duct disease.

Therefore, raised serum level of GGT can be used as a diagnostic marker in patients of CBD obstruction along with alkaline phosphatase.

CONCLUSION

Raised serum level of GGT can be used as a diagnostic marker in patients of CBD obstruction along with alkaline phosphatase.

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