

GAMMA GLUTAMYL TRANSFERASE LEVELS IN PATIENTS WITH VIRAL HEPATITIS CSherin Stephen¹, Ryhanath C. C²¹Professor & HOD, Department of Biochemistry, Academy of Medical Sciences, Pariyaram, Kerala.²Student, Department of Biochemistry, Academy of Medical Sciences, Pariyaram, Kerala.**ABSTRACT****INTRODUCTION**

Gamma Glutamyl Transferase is a protein found in high levels in the epithelial cells lining the bile ducts of liver. The manifestations of acute viral hepatitis is similar regardless of etiologic agent, but has important differences in terms of virology, epidemiology and chronic sequelae. Most cases of acute HCV infections are asymptomatic and the severity of liver image do not correlate with either the level of enzyme elevations or the amount of serum HCV virus RNA. The aim of the study is to establish GGT as a biochemical marker in viral hepatitis C. The specific objectives are to find out comparison and correlation of liver parameters used in the study. The present study group comprises 50 numbers each of patients and controls. Serum GGT, bilirubin total and direct, SGPT, SGOT, ALP, total protein, albumin, globulin and A/G ratio were investigated. The mean level of GGT was 111.04±19.48 IU/L in patients and 27.8±1.2 IU/L in controls which was statistically significant. The liver enzyme levels, AST, ALT, and ALP were significantly elevated. A positive correlation of GGT level with ALP was observed in the study but not with ALT, AST or bilirubin levels. The serum GGT level were found to be elevated in the patients under study and was statistically significant. So GGT level can be used as a biochemical marker in hepatitis C infection.

KEYWORDS

Gamma Glutamyl Transferase, Hepatitis C, SGOT, SGPT, ALP.

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INTRODUCTION: Hepatitis C caused by hepatitis C virus, which is a RNA virus belonging to Flaviviridae family, is transmitted through contact with blood, blood products, sexually and transplacentally. It usually remains asymptomatic for decades leading to chronic hepatitis, culminating in cirrhosis.¹ Serum GGT is widely used as an index of liver dysfunction. GGT protein is a single polypeptide that is cleaved by a protease to produce heavy and light chain, coded by seven genes; in addition to having no isoenzymes.^{2,3,4} GGT protects cells against free radical injury particularly in regions of inflammation as well as participates in events that modify acceptor ligands interaction at the cell membrane.⁵ In hepatitis C infected patients, serum GGT level rises as fibrosis progresses and has been implicated in fibrogenesis.⁶ GGT level is an independent predictor of sustained virological response in hepatitis C infection.⁷ The most common cause of cirrhosis and hepatocellular carcinoma leading to liver transplantation is chronic hepatitis C infection.⁸

In the present study, GGT was used as a biochemical marker in hepatitis C patients and its correlation with liver enzymes was also evaluated.

MATERIALS AND METHODS: The patients chosen for the study were non-alcoholic, 50 HCV infected individuals and 50 normal healthy controls who attended Academy of

Medical Sciences, Pariyaram from February 2015 to July 2015 and venous blood were collected with their consent. Detailed baseline clinical data of each patient age, sex, present and past clinical complaints and other associated complaints were noted.

The following biochemical investigations were done in patients and controls included in the study like estimation of serum gamma glutamyl transferase levels, total and direct bilirubin, SGOT, SGPT, total protein, albumin, globulin and A/G ratio. All investigations were done using AU 400 Beckmann fully automated analyzer.

RESULT: In the study group, among the 50 patients who were HCV positive, 39 were men and 11 were women with their mean age 40.44±12.67 years. Of the 50 controls, 33 were men and 17 were women with their mean age 40.05±10.94 years. Previous history of blood transfusion and parenteral injection were present in 26(p=0.000) and 37(p=0.037) patients respectively.

The mean level of GGT was 111.04±19.48 IU/L in patients while in controls was 27.8±1.2 IU/L and was statistically significant (p=0.000). The mean total bilirubin level in patients was 3.52±6.83mg% and in controls was 0.59±0.15mg% with a p value of 0.003. The mean value of direct bilirubin was 1.68±3.73mg% and 0.18±0.19mg% in patients and controls respectively, having a p value of 0.005. The mean SGPT levels in patients was 253.32±77.55 IU/L while in controls 23.10±6.66IU/L and was statistically significant (p=0.004). The mean value of SGOT in patients was 157.72±48.43 IU/L and in controls 29.60±1.47 IU/L, which was statistically significant with a p value of 0.010. The mean level of ALP in patients was 174.42±28.46IU/L when compared to 66.52±4.62 IU/L in controls. The level of ALP was significantly increased in hepatitis C patients than

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controls (p=0.000). The mean value of serum total protein was 7.20±1.08g% and 7.29±0.73g% in patients and controls respectively with an insignificant p value of 0.637. The level of mean albumin in patients was 3.60± 0.78g% and in controls 3.09±0.63g% (p=0.001).The mean globulin levels in patients was 3.58± 0.86g% while in controls 3.16± 0.40g% (p=0.002). The albumin globulin ratio in patients was 1.01±0.35 and in controls 1.28±0.18 (p=0.000).

DISCUSSION: In the present study gamma glutamyl transferase levels were significantly higher in patients with hepatitis C than control and was statistically significant (p=0.000). The total and direct bilirubin, SGPT, SGOT, ALP, albumin and globulin were higher in patients than control and statistically significant. The total protein levels were slightly lower in patients than control in addition to being statistically insignificant.

The GGT levels were positively correlated with total & direct bilirubin, ALP and globulin levels which were also statistically significant. So also, the GGT levels showed a negative correlation with A/G ratio and was statistically significant (p=0.031). But no correlation was observed between GGT and SGOT, SGPT and total protein levels in the present study.

Group	N	Mean	STD Deviation	P value
Patients	50	111.04	19.48	0.000
Controls	50	27.80	1.20	

Table 1: GGT Levels (IU/L)

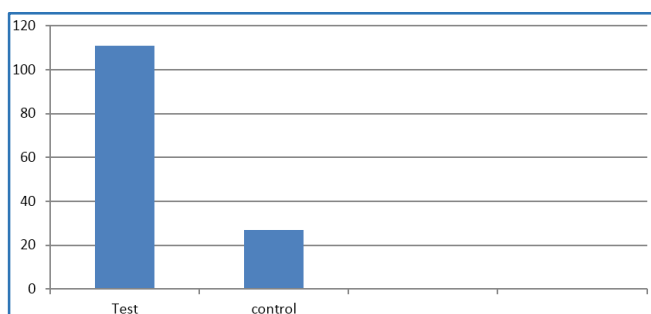


Fig. 1: GGT Level (IU/L)

GGT		Bilirubin Total	GGT
GGT	Pearson Correlation	0.031	1
	Sig (2 tailed)	0.830	
	N	50	50
GGT		Bilirubin Direct	GGT
	Pearson Correlation	0.015	1
	Sig (2 tailed)	0.918	
GGT		N	50
		SGPT	GGT
	Pearson Correlation	0.123	1
GGT	Sig (2 tailed)	0.394	
	N	50	50
		SGOT	GGT
GGT	Pearson Correlation	0.162	1
	Sig (2 tailed)	0.262	
	N	50	50

GGT		ALP	GGT
GGT	Pearson Correlation	0.383	1
	Sig (2 tailed)	0.006	
	N	50	50
GGT		Total Protein	GGT
	Pearson Correlation	0.093	1
	Sig (2 tailed)	0.520	
GGT		N	50
		Albumin	GGT
	Pearson Correlation	0.269	1
GGT	Sig (2 tailed)	0.059	
	N	50	50
		Globulin	GGT
GGT	Pearson Correlation	0.363	1
	Sig (2 tailed)	0.009	
	N	50	50
GGT		A/g ratio	GGT
	Pearson Correlation	0.305	1
	Sig (2 tailed)	0.031	
GGT	N	50	50

Table 2: Correlation of GGT with different parameters

CONCLUSION: In the present study, the mean level of Gamma Glutamyl transferase was significantly elevated in the patients with hepatitis C and was statistically significant when compared and correlated with controls. Evaluation of GGT level is a simple, cost effective and non-invasive investigation that can be done routinely in hepatitis C patients; either isolated or along with other liver enzymes. As hepatitis infection is a relatively asymptomatic disease which is diagnosed only in the later stages, when the patient proceeds to cirrhosis or hepatocellular carcinoma, estimation of GGT can be used as a biochemical marker to detect early subclinical cases of hepatitis C, so that complications can be greatly reduced.

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