

ORIGINAL ARTICLE

Significance of Sgot & Sgpt Ratio (De Ritis Ratio) & Ggt Levels In Patients of Liver Cirrhosis With And Without History of Alcoholism

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ABSTRACT

BACKGROUND AND OBJECTIVES: Liver is the 2nd largest internal organ in the human body involved in metabolism, detoxification and purification of blood. Chronic and excessive alcohol ingestion is one of the major causes of liver disease. A biochemical clue is the ratio of SGOT to SGPT (2:1), reflecting the low level of activity of SGPT in people with alcoholic liver disease. Objectives are to find out the levels of SGPT, SGOT and GGT levels in patients of cirrhosis with and without history of alcoholism and to compare these levels and calculate the SGOT to SGPT ratio. **METHODS:** Crosssectional study conducted in Medical College Vadodara. 60 male patients are included and divided into two groups. Group A – 40 patients who were alcoholics Group B – 40 patients who were nonalcoholics. SGPT, SGOT, GGT, were assayed using modified IFCC method on cobas c-311 Fullyauto Analyzer & SGOT/SGPT ratio was analyzed. Statistical analysis was done using unpaired t test and the significance calculated using Medcalc software. **RESULTS:** SGPT, SGOT, GGT levels showed very high statistically significant difference between two groups. GGT levels found to be very high in group A compared to group B. SGOT/SGPT (De-ritis ratio) 2.3 in group A and 1.5 in group B and showed very high statistically significant difference. **CONCLUSION:** In this study the Deritis ratio is significantly raised in Group A patients with >2.0 & in Group B >1.0 . Serum GGT levels are also raised significantly in patients with alcoholic cirrhosis compared to SGPT and SGOT levels.

Keywords: Alcoholism, De ritis Ratio, Cirrhosis

INTRODUCTION

Liver is the second largest internal organ in the human body involved in the metabolism of carbohydrates, proteins, fats and also in the detoxification and purification of blood. It is also involved in the storage of essential nutrients like glycogen and vitamins A, D, E, K and B12. Damage to the liver is thus a hindrance to all these functions. The severity of liver cell damage is thus assessed by a variety of biochemical tests like serum bilirubin, serum proteins, transaminases, alkaline phosphatase, gamma glutamyl transferase, prothrombin time etc. Chronic and excessive alcohol ingestion is one of the major causes of liver disease. Alcoholic liver disease

(ALD) is the most common cause of cirrhosis in the Western world¹. A biochemical clue is the ratio of SGOT to SGPT (2:1 at least), reflecting the low level of activity of SGPT in people with alcoholic liver disease. Previous studies have shown that the Deritis ratio (serum glutamate oxaloacetate amino transferase to serum glutamate pyruvate amino transferase) is greater than 2 in cases of alcoholic liver disease. The Deritis ratio is more sensitive during any phase of the disease. Several markers for high alcohol consumption per se have been studied e.g. carbohydrate deficient transferrin (CDT), gamma glutamyl transferase (GGT) and Serum glutamate oxaloacetate aminotransferase (SGOT). Most have fairly low sensitivities and specificities². An SGOT/SGPT ratio $>2:1$ suggestive, $>3:1$ is highly suggestive of alcoholic liver disease when clubbed with GGT. GGT is an useful parameter to detect liver disease & bile duct obstruction along with Bilirubin, SGOT, SGPT, ALP. Even small amounts of alcohol within 24

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hours may cause temporary increase in GGT.

OBJECTIVES

- To Estimate the serum SGOT, SGPT, GGT levels in patients of liver cirrhosis with and without alcoholism.
- To Estimate the ratio of SGOT & SGPT.
- Compare the SGOT, SGPT ratio & GGT levels in both groups.

MATERIALS AND METHODS

Present cross sectional study was comprised of total 80 male subjects who were clinically diagnosed to have cirrhosis. They were divided into two groups.

Group A – 40 patients who were alcoholics

Group B – 40 patients who were nonalcoholics

Exclusion criteria: 3 of group A & 7 of group B were excluded as they were found to have disease other than cirrhosis. All other conditions which can cause rise in GGT were excluded.

SGPT, SGOT, GGT, were assayed in all these subject using modified IFCC method on Roche- cobas c-311 Auto Analyzer & SGOT/SGPT ratio was analyzed.

Statistical Analysis: It was done using ‘unpaired t’ test. Results expressed as mean & SD. Comparison of variables between 2 groups performed with student t test & p value found to be <0.05 & is considered as statistically significant. All analysis were done using Medcalc software.

OBSERVATIONS

Table 1: shows the demographic profile of the subjects in the study.

	Group A	Group B	P Value
Total No. of Cases	40	40	-
Age	53±12	51±10	P >0.05
Sex	Male	Male	-

In present study, the two groups were age and sex matched. The mean(SD) age of Group A was 53(±12) and of Group B was 52(±10). All patients were males.

Table 2 and Figure 1 & 2: show the levels of serum SGPT, SGOT, GGT and SGOT/ SGPT ratio in two groups.

	Cirrhosis with Alcoholism		Cirrhosis without Alcoholism		P Value
	Mean	SD	Mean	SD	
SGPT	82	23	43	21	P < 0.001
SGOT	188	69	70	36	P < 0.001
GGT	239	170	46	34	P < 0.001
SGOT/SGPT Ratio	2.3	0.4	1.5	0.4	P < 0.001

Table 2 showed a very high statistically significant difference in SGPT, SGOT, GGT and SGOT/SGPT ratio. Serum GGT levels were markedly different. Along with GGT, SGOT/SGPT ratio > 2 high suggestive of alcoholic cirrhosis.

Figure 1: showing the levels of SGPT, SGOT, and GGT in both the groups.

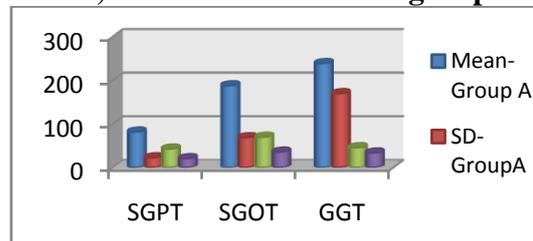
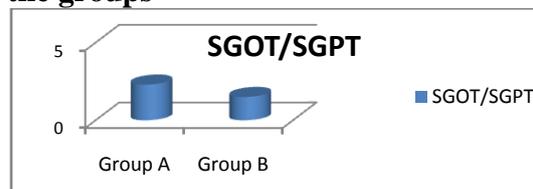


Figure 2: Showing SGOT/SGPT in both the groups



DISCUSSION

Cross sectional study conducted on 60 male patients with cirrhosis- 30 with history of alcoholism and 30 without history of alcoholism in medical college, Vadodara. Both the groups are age and sex matched. All the statistical analysis were done using Medcalc software. Results showed a very high statistically significant difference in SGPT, SGOT and GGT levels in both the groups. SGOT/SGPT (De ritis ratio) found to be 2.3 in group A and 1.5 in group B. Alcoholic liver disease (ALD) is one of the major public health problems related to alcohol use in the community. The diagnosis of ALD is based on the clinical and biochemical evidence of liver injury in the setting of chronic alcohol ingestion history. Among the specific biochemical change due to alcohol induced liver injury, the AST/ALT ratio has been found to be a useful diagnostic marker. In the present study, there was significant increase in the levels of AST and ALT in patients of alcoholic liver disease. The elevation of GGT was very high in patients with alcoholic cirrhosis compared to SGPT and SGOT, thus reflecting the diminished hepatic activity of these enzymes which made them to leak into the serum from damaged hepatocytes³. The increase in AST may be

due to increased cell membrane permeability, cell necrosis and mitochondrial leakage into the blood, caused by excessive alcohol consumption⁴. In the present study, there was significant increase in AST/ALT ratio in patients of alcoholic liver disease as compared to control. This is in agreement with Pujar et al who also found significant increase in AST/ALT ratio in patients of alcoholic liver disease as compared to control². In a study conducted by Gupta et al on 20 male patients of alcoholic liver disease with a history of alcohol intake for more than five years with daily intake of 80-160 gm continuously, there was significant elevation in serum AST and ALT levels associated with a significant elevation of the serum AST/ALT ratio as compared to controls⁵. These findings are consistent with our result.

Some reasons have been reported for the high AST/ALT ratio in alcoholic liver disease:

- i) A decreased hepatic ALT activity⁶.
- ii) Pyridoxal 5' phosphate depletion in the liver of alcoholics⁷.
- iii) Mitochondrial damage leading to an increase in the serum activity of mitochondrial aspartate in patients with high alcohol consumption⁸. There may also be some contribution of the direct toxic effect of alcohol on the AST/ALT ratio⁹.

CONCLUSION

In our study the Deritis ratio is significantly raised in patients with alcoholic cirrhosis - >2.0 & in cirrhosis >1.0 . Serum GGT levels are also raised significantly in patients with alcoholic cirrhosis compared to SGPT and SGOT levels. GGT was the most sensitive test.

Ideally all laboratories reporting abnormal ALT should also report AST & calculate the Deritis ratio as it provides useful diagnostic & prognostic information in alcoholic cirrhosis. The estimation of the Deritis ratio is essential for the rational understanding of the extent of damage in alcohol liver disease. Hence, the Deritis ratio can be considered as a reliable marker of ALD. However, further

studies with greater sample size are necessary to finally accept the concept.

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