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BLOOD SUGAR LEVEL AND HEPATIC FUNCTIONS AMONG PATIENTS OF CIRRHOSIS OF LIVER.

General Medicine

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ABSTRACT

Aim: There are known association of cirrhosis and diabetes, the aim of the present retrospective chart review study was to examine the association of blood sugar and hepatic enzyme levels in patients with liver cirrhosis.

Methodology: It was a retrospective chart review study all file and investigation reports of patients with liver cirrhosis were recorded with inclusion – exclusion criteria. Additionally sociodemographic matching control were also assessed.

Results: A total of 68 male sample size was included for the study, out of which 38 patients were of patients with cirrhosis with a mean age of 59.23 ± 7.32 years, and 30 healthy subjects with mean age of 58.17 ± 4.65. The BMI of these two groups were 25.7± 3.9 and 24.6 ± 4.1 respectively. The mean total serum glucose level, was 238.29 ± 27.31 for the cirrhotic patients, and for control it was 107.54 ±9.45 (p value < 0.001). All liver enzyme were significantly raised among the group of cirrhosis patients.

Conclusion: This study finds significant difference in blood glucose and hepatic enzyme levels across cirrhosis and normal control.

KEYWORDS

Hyperglycemia; Diabetes; Liver Cirrhosis; Hepatic Enzymes.

INTRODUCTION

Normally liver plays important role in maintaining glucose homeostasis, but in patients with cirrhosis there is alterations in glucose metabolism. As a result hepatogenous diabetes may developed in significant number of cirrhotic patients. There has been report of 96% of patients with cirrhosis may be glucose intolerant and 30% may be clinically diabetic [1]. There are other risk factors contributing to metabolic syndrome (obesity and hypertriglyceridemia), are also risk factors for the development and progression of liver disease [2,3]. Cirrhosis is associated with increased levels of advanced-glycation-end products and hypoxia-inducible-factors, which may play a role in the development of diabetes. [4, 5] First, diabetes is an independent factor for poor prognosis in patients with cirrhosis. Specifically, diabetes is associated with the occurrence of major complications of cirrhosis, including ascites and renal dysfunction, hepatic encephalopathy and bacterial infections. Insulin resistance in muscular and adipose tissues and resultant hyperinsulinemia seems to be the patho-physiologic bases of diabetes as liver disease driven complication [6-8].

The aim of the present retrospective chart review study was to examine the study the association of blood sugar and hepatic functions in patients with liver cirrhosis.

MATERIAL AND METHODS

This was a cross-sectional hospital-based study, conducted at a tertiary care medical college hospital, Odhisa, India during January and February 2020. The study protocol was approved by the institutional review board of institute. The record file and investigation reports of patients who were either admitted to medical wards or attending outpatients, were included for study which were diagnosed as cirrhosis of liver, aged 18-60 years of male gender. The control group consisted of socio-demographically matched healthy control. All included records of patients were compiled with their socio-demographic variables and clinical information. The socio demographic data sheet included age, occupation, education and clinical history like, history of Diabetes Mellitus, Hypertension, duration of treatment for cirrhosis, etc. All patients record of blood biochemical and hematological repots were noted.

These included blood glucose PP, total cholesterol, Liver function tests including- Aspartate aminotransferase (AST or SGOT), Alanine aminotransferase (ALT or SGPT), Alkaline phosphatase, 5' nucleotidase, Gamma-glutamyl transpeptidase (GGT), LDH (Lactate dehydrogenase), prothrombin time or PT, estimation of Albumin level, estimation of serum Bilirubin level, platelet count.

Statistical Analysis: The collected data of all subjects was statistically analyzed, using Statistical Package for Social Sciences (SPSS, Inc., Chicago, Illinois) version 10.0. Data analysis included means and standard deviations for complete sample for all continuous variables. Other categorical data analysed as descriptive frequency in percentage. Data analysis included means and standard deviations for both group of patients of cirrhosis and normal control. The independent sample t-test was used to determine if differences existed between the means of groups for different variables. Statistically significant levels are reported for p values less than or equal to 0.05. Highly significant levels are p values less than .001.

RESULT:

A total of 38 male patients were included for the study, and 30 healthy subjects who were investigated during their routine examinations, consisted control group. The group of patients with cirrhosis had a mean age of 59.23 ± 7.32 years, where as for the control group mean age was 58.17 ± 4.65 (p= .148). The mean years of education in these two groups was 10.78 ± 1.82 and 10.38 ± 2.03 (p= .687) years respectively. The BMI of these two groups were respectively 25.7± 3.9 and 24.6 ± 4.1 (p= 1.51) (Table -1).

Table-1: Table Showing Comparative Age, Education And Clinical Data Of Cirrhosis And Normal Control

S. No	Parameters	Patients (N=38)	Controls (N=30)	P value (by independent t test)
1	Age	59.23 ± 7.32	58.17 ± 4.65	.148
2	Education in years	10.78 ± 1.82	10.38 ± 2.03	.687
3	BMI	25.7± 3.9	24.6 ± 4.1	
4	Total cholestrol	186.67±34.42	134.63±37.13	< 0.001
5	Mean Serum Glucose PP	238.29 ± 27.31	107.54 ±9.45	< 0.001
6	AST or SGOT	131.29 ± 19.34	13.53 ± 3.23	< 0.001
7	ALT or SGPT	287.76 ± 29.18	28 ± 8.72	< 0.001
8	Alkaline phosphatase	241.83 ± 32.75	57 ± 12.53.	< 0.001
9	GGT	87.76 ± 8.78	24.98 ± 3.78	< 0.001
10	LDH	247.35 ± 25.78	124.65 ± 13.43	< 0.001
11	Prothrombin time	31.63 ±	8.6 ± 2.90	< 0.001
12	Total Albumin	2.09 ± 0.31	3.90 ± 1.03	0.004
13	serum Bilirubin	7.88 ± 1.46	0.86 ± 0.18	0.001

The main result was blood investigation report of these two groups, the mean total serum glucose level, after 2 hours of 100gm glucose intake

was 238.29 ± 27.31 for the cirrhotic patients, but for the control it was only 107.54 ±9.45 (p value < 0.001). All liver enzyme and function tests were found to be significantly different across group of cirrhosis and normal control (Table-1).

DISCUSSION

In the present study we attempted to compare the blood sugar and liver enzyme results in a group of male cirrhosis patients and with healthy control. We did find significant difference in higher blood sugar level and raised liver enzymes in patients of hepatic cirrhosis. Hepatogenous diabetes is clinically different from that of type 2 DM, since it is less frequently associated with microangiopathy and patients more frequently suffer complications of cirrhosis. [9,10]. Cirrhosis contributes to the development of hyperglycemia through numerous pathway. Studies suggests development of portal hypertension leading to blood shunting away from hepatocytes and results in reduced insulin clearance with peripheral hyperinsulinemia, which finally results in insulin resistance due to down regulation of insulin receptors [11]. Hyperglycaemia and oxidative stress also contribute to the accumulation of advanced-glycation-end (AGE) products.[12]

This view is also supported by the fact that glucose control deteriorates and circulating insulin levels increase after transjugular intrahepatic portosystemic shunt placement in diabetic patients [13]. Type 2 diabetes is a risk factor for liver fibrosis development and progression. There is a strong relationship between the components of the insulin resistance syndrome and the stage of fatty liver, liver fibrosis, reduction in glycogen, reduction in gluconeogenesis, increased risk of liver and biliary tract cancers [14].

In studied subjects with cirrhosis, all biochemical parameters significantly associated with diabetes or hyperglycemia. There was no significant differences of BMI across the group of hepatic cirrhosis and normal control, As obesity itself may not be crucial to the pathogenesis of liver dysfunction or diabetes in present sample. We also did not included female gender as it was quite less frequent in chart review and to maintain homogeneity of sample.

CONCLUSION

This present study justify a relationship, between diabetes and the liver. There is significant difference in blood glucose and hepatic enzyme levels across cirrhosis and normal control.

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Declaration of Interest: "The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this paper."

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