ORIGINAL ARTICLE

Hypoglycemia in patients presenting with Liver Cirrhosis

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ABSTRACT

Background: Due to liver cirrhosis, gastrointestinal functions of human body also disturbed and leads to the occurrence of other comorbidities. Hypoglycemia is one of the rising complications of cirrhosis. So we planned this study to find the variation in blood sugar level in patents of cirrhosis.
Aim: To assess the frequency of hypoglycemia in patients with liver cirrhosis
Study design: Cross sectional study.
Setting & duration: Department of Medicine, Mayo Hospital, Lahore, six months duration
Methodology: Eighty four cases of cirrhosis were selected through OPD. Blood sample wasobtained and BSR was tested and hypoglycemia was noted. SPSS v.20 was used to analyses the data. Frequency and percentage was calculated for hypoglycemia.
Results: The mean age of the patients was 44.39±17.06years. There were 61.9% males and 38.1% females. Mean duration of cirrhosis was 2.61±1.47 years. Child-Pugh grade A was noticed in 34.5%, grade B in 29.8% and grade C in 35.7%. The mean blood sugar level 88.50±37.68mg/dl. Hypoglycemia was present in 51.2% cases. Hyponatremia was present in 51.7% Child-Pugh class A, 56% in Child-Pugh class B and 46.7% in Child-Pugh class C. The difference was insignificant (P>0.05).
Conclusion: The frequency of hypoglycemia in cirrhotic patients was high and no negligible.
Keywords: Chronic liver disease, Hypoglycemia, blood sugar level

INTRODUCTION

Liver plays an important part in homeostasis of glucose in blood. Dysfunction of liver in metabolism, structure or intra-cellular functioning may change the ability of liver to sustain normal glucose homeostasis. When these dysfunction changes liver glucose secretion, hypoglycemia occurs. Various drugs including alcohol might change thefunctioning of liver, which are essential for normal excretion of glucose through liver. Impulsive hypoglycemia is a sign to examine liver functioning and a cautiousinspection of drugs and medications which cause these dysfunction or bio-chemical integrity[1].

Liver cirrhosis might be one of the major cause of mortality in different areas worldwide[2,3]. Hepatitis C or B virus, substantial alcohol ingesting & non-alcoholic fatty liver disease, are the major risk factors of liver cirrhosis[4]. Cirrhosis can cause marginal hyperinsulinemia because of reduced insulin clearance. Spontaneous hypo-glycaemiain cirrhotic patients characterizes an investigative encounter because of co-existing hyperinsulinemia[5].

The liver has an essential role in metabolism of carbohydrate subsequently it maintainsthe quantity of glucose in blood through glycogenogenesis & glycogenolysis[6,7]. A decreased reaction of islet β-cells of pancreas &insulin resistance in liver are also influential factors[8,9]. Insulin resistance causes high risk for the failure of treatment response in cirrhotic patientsand triggersevolution of cirrhosis to fibrosis.[10,11]About 96% of cirrhotic patients may have impaired glucose level while 30% may clinically diagnosed as diabetic[10,12,13].

Hypoglycemia has several factors including liver cirrhosis, because liverhas main role in glucose secretion and maintenance of blood glucose levels[14,15]. The prevalence of hypoglycemia is reported as 58% in patients of liver cirrhosis[16].

The objective of the study was to assess the frequency of hypoglycemia in patients of liver cirrhosis.

MATERIAL AND METHODS

This cross sectional study was conducted in the Department of Medicine, Mayo Hospital, Lahore from Oct 2016 to Oct 2017. Eighty four cases was calculated with 95%confidence level, 5%margin of error and taking hypoglycemia percentage i.e., 58% in patients of cirrhosis. Simple random sampling technique was used. Patients aged 16–75 years of either gender with liver cirrhosis were included. Patientsdiagnosed with diabetes before cirrhosis (HbA1c>7% and patient taking antiglycemic medicine).

Eighty four patients fulfilling the selection criteria were selected through OPD. Informed consent was

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obtained. Demographics were also recorded. Then blood sample will be obtained by pricking middle finger of patient. Blood drop will be obtained on glucometer and sugar level will be noted. If sugar level≤70mg/dl then hypoglycemia was labeled. Patients with hypoglycemia were managed as per hospital protocol. The collected information was analyzed through SPSS 21. For age, duration of cirrhosis and BSR, mean±SD were calculated. Frequency and percentage was calculated for sex, Child-Pugh class and hypoglycemia.Hypoglycemia was compared with Child-Pugh class and chi square test was applied. P-value≤0.05 was considered as significant.

RESULTS

The mean age of the patients was 44.39±17.06years. There were 61.9% males and 38.1% females. Mean duration of liver cirrhosis was 2.61±1.47 years. Child-Pugh grade A was noticed in 34.5%, grade B in 29.8% and grade C in 35.7%. The mean blood sugar level 88.50±37.68mg/dl (Table 1) Hyponatremia was present in 51.2% cases (Fig 1).

With Child-Pugh class A, hyponatremia was present in 15 (51.7%) patients, in Child-Pugh class B, hyponatremia was present in 14 (56.0%) patients and in Child-Pugh class C, hyponatremia was present in 14 (46.7%) patients. The difference was insignificant (P>0.05). (Table 2)

Table 1: Characteristics of patients

n	84
Age (Years)	44.39±17.06
Gender (m/f)	52(61.9%) / 32(38.1%)
Duration of cirrhosis	2.61±1.47
Child-Pugh classification A B C	 29(34.5%) 25(29.8%) 30(35.7%)
Blood sugar level	88.50±37.68

Fig 1: Distribution of hypoglycemia

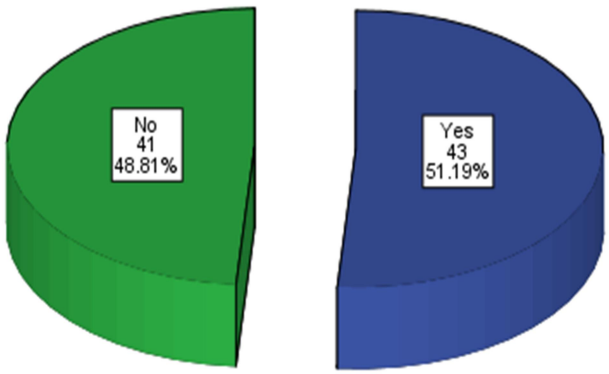

Table 2: Comparison of hypoglycemia in Child-Pugh class

Grades	Hypoglycemia	
	Yes	No
A	15 (51.7%)	14 (48.3%)
B	14 (56.0%)	11 (44.0%)
C	14 (46.7%)	16 (53.3%)
Total	43 (51.2%)	41 (48.8%)

p = 0.786 (Insignificant)

DISCUSSION

CLD including cirrhosis, is regarded for several metabolic changes, mainly catabolic, causing malnutrition including cachexia in fewcases[17,18]. The obligation of liver function in management of carbohydrate homeostasis is important in considering the many physical & bio-chemical changes which happen in liver in presence of diabetes and to consider how hepatic disease can alter glucose breakdown[19,20].

Usually, patients with liver cirrhosis have evident glucose intoleranc categorized as hyper-insulinemia, hyper-glucagonemia, insulin resistance& down-regulation of insulin receptors. However, hyper-insulinemia is maybe caused by declined liver regulation of insulin, hyper-glucagonemia is predominantly because of elevated pancreatic discharge[21,22].

Numerous trials proposed that elevated glycemic level in blood of cirrhotic patients has high risk of further destruction of liver and high mortality rate.[23]In our study, we included 84 patients of liver cirrhosis, with the mean age of 44.39±17.06years. There were 61.9% males and 38.1% females. Mean duration of liver cirrhosis was 2.61±1.47years. Child-Pugh grade A was noticed in 34.5%, grade B in 29.8% and grade C in 35.7%. The mean blood sugar level 88.50±37.68mg/dl. Hyponatremia was present in 51.2% cases. Tanveer et al., found the prevalence of hypoglycemia is 58% in patients of liver cirrhosis.[16] Singh et al., found the frequency of hypoglycemia in 67% patients who had liver cirrhosis[24]. Nouel et al., observed hypoglycemia in 50% patients with liver cirrhosis[25].

In our study, hyponatremia was present in 15(51.7%) patients with Child-Pugh class A, 14(56%) patients in with Child-Pugh class B and in 14(46.7%) patients with Child-Pugh class C. The difference was insignificant (P>0.05). However, Singh et al., reported significant difference for hyponatremia in different grades of cirrhosis i.e. in Child-Pugh class A = 23.9%, in Child-Pugh class B = 44.8% and in Child-Pugh class C = 31.3%, p=0.02[24].

CONCLUSION

Thus it has been concluded that hypoglycemia was present in almost half of cirrhotic patients. Now, on the basis of these results, we recommend the regular screening of blood sugar level in cirrhotic patients to prevent hypoglycemia which may cause perilous consequences.

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