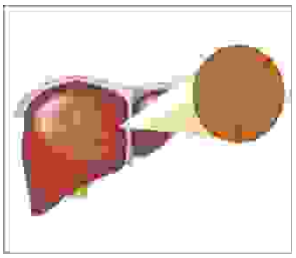
ORIGINAL PROF-745

HYPOGLYCEMIA IN LIVER CIRRHOSIS



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ABSTRACT... inayatullah@hotmail.com **Objectives:** To determine the frequency of hypoglycemia in patients with advanced cirrhosis and its possible precipitating factors. **Design:** It was a simple descriptive study. **Setting:** Ist Medical Unit Nishtar Hospital Multan. **Period:** July 1997 to July 1998. **Material and Methods:** Fifty patients with advanced cirrhosis (child B and C) were studied. Diabetic patients, those who had fasting plasma glucose above normal and those on I/V dextrose infusion were excluded from study. **Results:** 34 (68%) patients had child C disease and 16 (32%) patients had child B disease. On the basis of plasma glucose level, patients were divided into 3 groups. Group I (fasting plasma glucose <50 mg%) included 3 (6%) patients. All had symptoms of hypoglycemia and evidence of sepsis (spontaneous bacterial peritonitis 2, Urinary tract infection 1). 18 (36%) patients in the second group (blood glucose 50-60 mg%) and 79 (58%) patients in the third group (blood glucose >60 mg%) had no compounding factors. Their ages were between 35 and 63 years. **Conclusions:** Fasting hypoglycemia was seen only in decompensated cirrhosis. It was more likely to occur in the presence of complicating factors response to hypoglycemia was intact.

INTRODUCTION

Cirrhosis is the result of chronic injury to hepatic parenchyma causing hepatocyte necrosis, extensive fibrosis and nodular regeneration. This is a final outcome of many types of chronic liver injury. Clinical features of cirrhosis derive from the morphologic alterations and often reflect the severity

of hepatic damage rather than its etiology[1].

As the liver holds the key position in carbohydrate metabolism, it follows that such a diffuse liver disease would result in significant disturbance of glucose homeostasis. Only 20% of hepatocyte mass is required to maintain plasma glucose level within normal limits, when hypoglycemia occurs it is usually due to severe hepatocellular failure occurring as a terminal event, or when there is increased metabolic demand (e.g. in sepsis).

The purpose of the study was to determine the frequency of hypoglycemia in patients with advanced cirrhosis and its possible precipitating factors.

MATERIAL & METHODS

Fifty patients with advanced cirrhosis (child B and C) admitted to Ist Medical Unit Nishtar Hospital between July 1997 and July 1998 were studied. Diabetic patients and those on I/V dextrose infusion were not analyzed.2 ml of venous blood was obtained on 3 consecutive days after an overnight symptoms of hypoglycaemia occurring during the night and in those patients where such symptoms occurred immediate blood samples were taken and the fast was terminated with glucose replacement. Blood was immediately centrifuged to separate the plasma, which was sent to the Lab for glucose estimation.

The following precipitating factors were looked for;

a. Drugs (quinine, salicylates)
b. Malaria
c. Sepsis
d. Neoplasia
e. Coexisting renal failure

Child Pugh Classification of the patients was done after the admission on the basis of ;

1. Serum billirubin
2. Serum albumin
3. Prothrombin Time
4. Ascites
5. Neurological state

STATISTICAL METHODS

Computer programme SPSS was used to interpret data.

RESULTS

The total number of patients was 50. Fortythree 43 (86%) of the patients were males and 7 (14%) of them were females. The age range was 35-63 years (mean age 49 years).

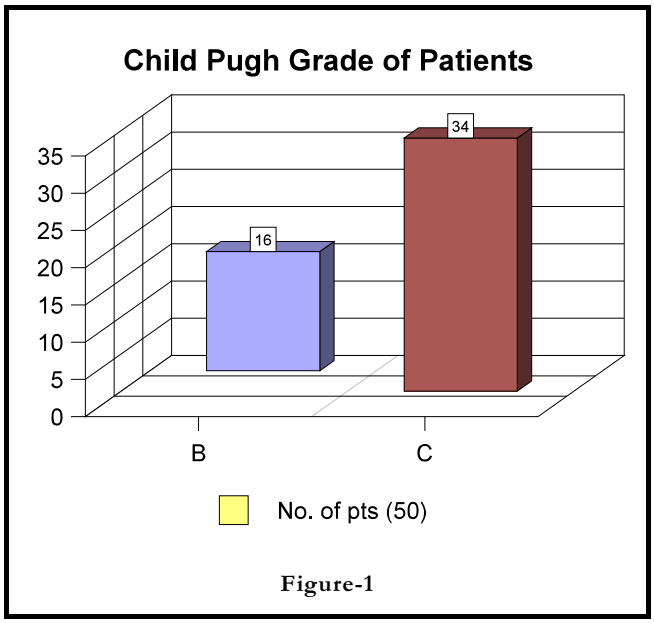

Figure-1

Cirrhosis in these patients was diagnosed 1-5 years back on the basis of imaging studies e.g. ultrasonography, liver and spleen scan[2]. Viral markers were not studied as the etiology of cirrhosis was not taken into account. 34(68%) patients had child C disease and 16 (32%) patients had child B disease (Fig-1).

On the basis of fasting plasma glucose <50 mg%) consisted 3 (6%) male patients. All had symptoms of hypoglycaemia and evidence of sepsis as Spontaneous Bacterial Peritonitis and/or Urinary Tract Infection.

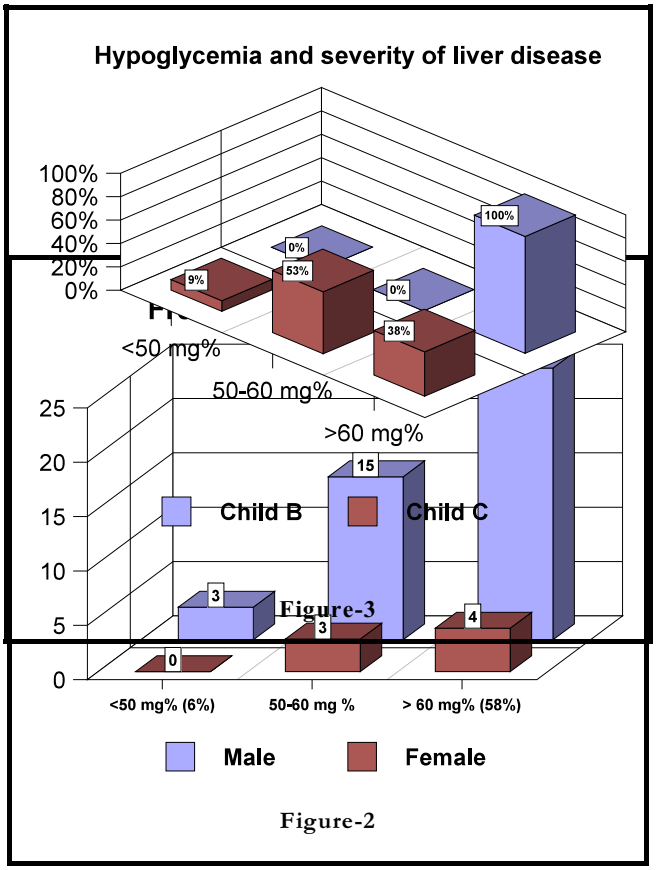

Figure-2

Figure-3

There were 18 (36%) patients (15 male & 3 female) in the second group (plasma glucose 50-60 mg%) and 29 (58%) patients (25 male and 4 female) in the third group)plasma glucose > 60 mg %) had no compounding factors. All these patients had no symptoms of hypoglycemia and no compounding factors. All the patients in group I and 2 had child C disease (Figure-3).

DISCUSSION

The liver is the major organ, which possess the enzyme glucose 6 phosphatase that releases glucose into the circulation . It is also the major reservoir of glycogen weighing approximately 70 g.

While patients with compensated cirrhosis have also glucose intolerance, those with decompensated cirrhosis are at an increased risk. Predominant derangement in compensated cirrhosis being insulin resistance whereas in decompensated cirrhosis it is glucagon resistance resulting in decreased gluconeogenic response[9,10,11]

In a normal person the transition from fed to fasted state occurs after 36-48 hours of fasting but when cirrhotics are fasted there may be a more rapid transition to a pattern of starvation. Hepatic glucose production falls as there are insufficient glycogen stores and capacity for gluconeogenesis is also severely limited due to decreased and diseased parenchyma.

Several groups using radioisotopic methods or hepatic vein chatheterization have found hepatic glucose production in cirrhotics to be 20-40% lower than in normal subjects following an over night fast. Others have reported normal values[4]. Difference in patient selection and methodology may part account for these differences. Other studies revealed a diminished hyperglycemic response to the administration of glucagon whether given alone[5] or in combination with adrenaline[6].

Possible explanations are[7].

1. Hepatic resistance to glucagon.
2. Decreased hepatic delivery of glucagon and gluconeogenic substrates as a result of porto-systemic shunting
3. Decreased liver glycogen contents

It seems likely that additional problems like an excess of insulin and insulin like substances in late cirrhosis also contribute to the development of hypoglycemia[8]. Hypoglycemia may be included by a variety of

recognized factors for example;

- Drugs like quinine, propranolol, salicylates
- Malaria, sepsis, prolonged starvation, neoplasia, excessive exercise.
- Coexistent renal failure.
- Endocrinopathies (like pituitary, thyroid, adrenocortical insufficiency).

In our study fasting hypoglycemia was observed only in 3 out of 34 patients with severely decompensated liver disease (child pugh grade C), which is in agreement with the findings of Hartl-et al[12] and other workers who reported it as an uncommon observation in cirrhosis. All three patients had sepsis.

CONCLUSION

1. Fasting hypoglycemia was seen only in decompensated cirrhosis.
2. It was more likely to occur in the presence of a compounding factor (e.g. sepsis)
3. Symptomatic response to hypoglycemia was intact.
4. Hypoglycemia though uncommon is a potentially serious but treatable condition and should be looked for in all the patients with advanced chronic liver disease.

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