

HbA1c and 2 Hours Post-Prandial Blood Sugar Levels in Known Cirrhotic Adult Patients due to HBsAg and/or Anti-HCV Positive, Who are Not Known Diabetics

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ABSTRACT

Background: Liver has a special and unique system of glucose metabolism which keeps its levels under normal ranges. In chronic liver hepatitis and cirrhosis this mechanism is altered.

Aim: To evaluate undiagnosed diabetics through HbA1C and 2 hours post prandial blood sugar levels in confirmed hepatitis B and C cirrhotic adult patients.

Study design: Descriptive cross-sectional study

Place and duration of study: Department of Gastroenterology, Chandka Medical College, Shaheed Mohtarma Benazir Bhutto Medical University, Larkana from 1st July 2020 to 30th June 2021.

Methodology: One hundred and twenty four patients >50 years with liver cirrhosis due to hepatitis B and C were enrolled. All clinical, demographic data of patients as well as their blood analysis was performed for testing HbA1C and two hour post prandial blood sugar (as well as liver function test).

Results: The mean age was 57.9±5.9 years and majority of patients were males in both hepatitis cases. There were 39.5% of liver cirrhosis patients having undiagnosed diabetes which was confirmed by 2 hours post prandial blood sugar and HbA1c. Within this value 54.8% had hepatitis C and 24.2% had hepatitis B.

Conclusion: There is a high prevalence of elevated HbA1c, post prandial blood sugar and consequently diabetic population (undiagnosed) among hepatitis B and C liver cirrhotic adult patients.

Keywords: Post-prandial blood sugar, Cirrhotic adult patients, HBsAg, Anti-HCV, Diabetics

INTRODUCTION

Chronic hepatitis B and C resulting into liver cirrhosis are considered as on the highest prevalent viral infections over the globe. However, the prevalence of these diseases is much higher in developing and under developed countries. In addition to this the developing countries also holds a large prevalence of diabetic patients either symptomatic or asymptomatic. Type 2 diabetes being more prevalent and is associated with adult population¹. According to world health organization global statistics of hepatitis shows a global surge on B and C cases around 200 million cases.² WHO also reports 347 million type 2 diabetic cases over the globe. In developed western world the prevalence of hepatitis C is indeed decreasing, but unfortunately the diseases associated with it still highly prevalent presenting extra-hepatic features³⁻⁵.

In Pakistan prevalence of asymptomatic type 2 adults ranges up to 34% in general population⁶. Patients suffering from chronic hepatitis B and C illness has an increased risk of type 2 diabetes especially in cases of liver cirrhosis.^{7,8} The fact which contributes to type 2 diabetes involves liver damage as a consequence of cirrhosis. Glucose intolerance and insulin resistance occurs in cases having liver dysfunctions. The attributing justification for this is that liver converts glucose into glycogen. Impairment in liver functioning increases glucose levels and effects β cells of pancreas resulting in insulin resistance and type 2 diabetes⁹⁻¹¹.

Type 2 diabetes is mostly found at later stages in life than type 1 diabetes. This is the reason it is also called "adult-onset diabetes". Many patients suffering from hepatic cirrhosis are unknown of the fact that they have developed type 2 diabetes which can be equally lethal as their primary disease infection.¹² Therapies for hepatitis C could also result in increasing autoimmune body responses and result in formation of diabetes¹³.

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The diabetes caused by impaired liver cirrhosis is known as hepatogenous diabetes and is considered a complete separate entity by clinicians¹⁴.

The present study was designed to identify the prevalence of asymptomatic type 2 hepatogenous diabetics in adult patients for their better timely management and treatment.

MATERIALS AND METHODS

This was a descriptive cross sectional study was enrolled 124 adult patients unknown of their diabetic status having chronic hepatitis B and C with liver cirrhosis. The study was conducted at Department of Gastroenterology, Chandka Medical College, Shaheed Mohtarma Benazir Bhutto Medical University, Larkana from 1st July 2020 to 30th June 2021 after permission from ethical committee. Patients who were above age of 50 were included in the study. Those patients who had hepatic cirrhosis due to other reasons than hepatitis C and B were excluded from the study. The study was conducted after ethical institutional approval as well as informed consent received from each patient. A 5cc blood of each patient was withdrawn for analysis of HbsAg, Anti HCV, post-prandial blood sugar (PPBS=2 hours), HbA1c and Liver function Test (LFT). Diabetes was made confirmed through HbA1c results accompanied with blood sugar levels >6.9% and >200mg/dl respectively. The demographic, age, clinical history and symptoms data was entered in a questionnaire. Analysis was done by SPSS-24.0 version. Analysis tools as one way analysis of variance (ANOVA), Chi square and t tests were adapted. P value <0.05 was considered as significant.

RESULTS

There were 62 hepatitis C patients and 62 were hepatitis B patients. The age of the patients was between 50-70 years with a mean age as 57.9±5.9 years. There were more patients in 50-60 years of age with hepatitis B. Majority of patients were males in

both hepatitis cases (Table 1).

The overall prevalence of diabetes was estimated as higher in females than males with more undiagnosed cases reported in hepatitis C patients (Fig. 1).

The present study found 39.5% of liver cirrhosis patients suffering from undiagnosed diabetes within which 54.8% were those from hepatitis C group while 24.2% were from hepatitis B cases (Table 2).

The HbA1c levels showed a unique distribution of these diabetic patients between controlled and uncontrolled sugar status. Majority of females had uncontrolled undiagnosed diabetes in

Table 2: Analyses of PPBS levels in undiagnosed diabetic hepatitis cirrhotic patients

Post-prandial blood sugar	Hepatitis C			Hepatitis B		
	Total	Male	Female	Total	Male	Female
<200mg/dl	28 (45.16%)	20 (71.4%)	8 (28.57%)	47 (75.8%)	37 (78.7%)	10 (21.2%)
≥200mg/dl	34 (54.8%)	16 (47.05%)	18 (52.9%)	15 (24.2%)	7 (46.6%)	8 (53.3%)

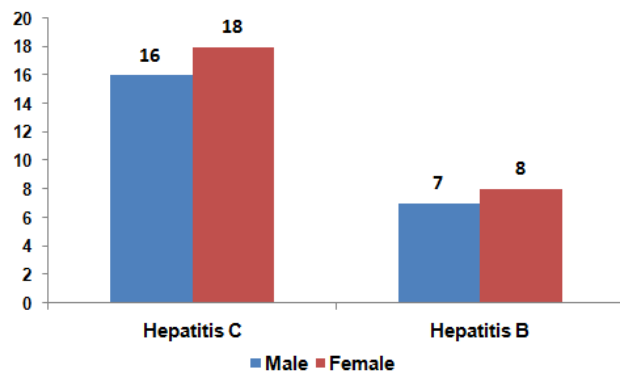
P value<0.05

Table 3: HbA1c levels among hepatitis B and C patients

HbA1c Level	Hepatitis C			Hepatitis B		
	Total	Male	Female	Total	Male	Female
≤7%	28 (45.16%)	20 (71.4%)	8 (28.57%)	47 (75.8%)	37 (78.7%)	10 (21.2%)
7-7.9%	2 (3.2%)	-	2 (100%)	1 (1.61%)	1 (100%)	-
8-10%	15 (24.1%)	6 (40%)	9 (60%)	6 (9.67%)	2 (33.3%)	4 (66.6%)
>10%	17 (27.1%)	10 (58.8%)	7 (46.6%)	8 (12.9%)	4 (50%)	4 (50%)

<7%=non diabetic, 7-7.9%= pre diabetic, 8-10=diabetic, >10%= uncontrolled diabetic p value<0.05

Fig 1: Gender frequency of undiagnosed hepatogenous diabetics



DISCUSSION

A wide diabetes prevalence ranges are reported in patients suffering from chronic liver diseases as hepatitis B or C. In present study the adult patients suffering from liver cirrhosis and hepatitis B and C belonged to a mean age of late fifties. Cirrhosis is a condition which is formed at later stages of chronic liver illness.¹⁵

There were more males in the hepatitis B and C patients than females. In cases with hepatitis C associated cirrhosis it has been reported that the estrogen receptor expression decreases in male patients than females attributing to worst outcomes of hepatitis C in males comparing to females. Therefore, the higher female hormones in women assist in keeping the viral load low in hepatitis cases than in male gender.¹⁶

The present study reported uncontrolled HbA1c as in 27.1% diabetic patients with hepatitis C and liver cirrhosis and as in 12.9% hepatitis B cirrhotic patients. The overall prevalence of type 2 undiagnosed cases was collectively assigned after measuring the PPBS levels as well as HbA1c. It presented that within hepatitis C and B cirrhotic cases 54.8% and 24.2% were undiagnosed diabetics respectively.

The overall prevalence of diabetes was noticed as 39.5% in total hepatitis patients suffering from liver cirrhosis. Studies from Pakistan reported 25.5% and 73.3% diabetes prevalence in hepatitis B and C cases with a total prevalence of diabetes as 27.9% to 50% among all hepatitis cirrhotic patients. It is also

addition to their hepatitis and liver cirrhosis conditions (Table 3).

Table 1: Cirrhosis, gender and age distribution among patients (n=124)

Patients	Hepatitis C		Hepatitis B	
	Male	Female	Male	Female
Liver cirrhosis	36	26	44	18
Age (years)				
50 – 60	14	16	31	11
60 – 70	22	10	13	7

reported that majority of patients having liver cirrhosis are presented within 50s followed by patients in their 60s age.^{17,18}

Advanced age is frequently associated with high risk factors of liver deformation and more frequent chances of other hepatic complications.¹⁹ In the present study diabetes was found at a higher risk in female hepatitis B as well as C patients. Similar results have been elaborated by other researcher in their study with females more prone towards hepatogenous diabetes than males.²⁰ On the contrary in western countries where alcoholism is more common in males than females have contradictory results for liver cirrhosis between genders.²¹

CONCLUSION

A significant number of hepatitis B and C patients have elevated PPBS and HbA1c levels. There is a significant number of undiagnosed diabetic adult patients suffering from hepatitis C and B with liver cirrhosis with much higher prevalence of these in hepatitis C liver cirrhotic patients.

Conflict of interest: Nil

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