DOI: https://doi.org/10.53350/pjmhs22168605

ORIGINAL ARTICLE

Evaluation of Liver Function Among Patients Presented with Hepatocellular Carcinoma

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ABSTRACT

Objective: To determine the liver function assessment in the patients presented with hepatocellular carcinoma.

Methodology: This cross-sectional study was done at the gastroenterology departments of Liaquat University Hospital Hyderabad and Indus Medical College TM Khan. Patients with an age range of 20 to 70 years, both genders, and having hepatocellular carcinoma were included in the study. A 5 mL blood sample was taken from each participant and sent to the hospital diagnostic laboratory to assess the serum bilirubin level and albumin level. The albumin-bilirubin (ALBI) score was used for hepatic function. Data was collected using a self-made research proforma, and it was analyzed using SPSS 26.

Results: A total of 58 cases having HCC were assessed regarding hepatic function. The mean age of the patients was 55.39+12.39 years. Males were in the majority 75.9%, and females were 24.1%. The majority of the patients (72.4%) had child Pugh class C, 12.1% had child Pugh class B, and 15.5% of the cases had child Pugh class A. Elevated bilirubin levels of albumin levels and Alpha-fetoprotein levels were significantly associated to the child Pugh class C (p= <0.05). Most of the cases, 67.3%, had an ALBI score > -1.39, 10.3% cases had ALBI score -2.59 to -1.39, and 22.4% of patients had an ALBI score ≤ -2.60.

Conclusion: Severe hepatic dysfunction was observed to be frequently high among patients having hepatocellular carcinoma, as most of the cases had Pugh class C and ALBI stage 3. Due to the extremely small sample size used in this study, the results are not trustworthy.

Keywords: HCC, Hepatic function, Bilirubin, Albumin, ALBI

INTRODUCTION

Hepatocellular carcinoma is a serious health issue and the fourth most common cause of carcinoma-related death throughout the world.[1] Its overall rate of survival is very poor. Only 2% of patients with metastatic hepatic cancer have a 18.4% five-year proportional rate of survival. [1] HCC is frequently caused by cirrhosis, which can be brought on by nonalcoholic steatohepatitis, alcoholism, hepatitis B, or hepatitis C, though its etiology differs globally.[2,3] An important phase in the viral carcinogenesis of hepatic cancer in patients with cirrhosis. The major pathophysiology for oncogenesis in hepatitis B virus is the integration of its viral genome into the host genome.[4] 60% of occurrences of HCC are caused by viral genome insertions in the human genome's telomerase reverse transcriptase (TERT) promoter regions. [4,5]

Baseline liver function evaluations upon diagnosis may be able to predict prognosis in individuals with HCC because many of them have advanced liver disease or cirrhosis and reduced liver function.[2] In patients suffering from HCC, baseline liver function influences the patient's survival, and various liver function parameters have now been implicated as potential predictors of poor prognosis. Based on a complex interaction of characteristics, such as tumor size, quantity, localization, and clinical manifestations, such as baseline liver function, the best treatment approach for HCC is chosen.[6] It is challenging to assess the liver's function in a thorough manner due to its numerous and intricate tasks. The severity of the hepatic damage helps to determine whether hepatectomy is necessary and how much of the liver can be resection, but it has no bearing on the use of nonsurgical treatments. [6] From serum bilirubin concentration to indocyanine green clearances, single assays can provide useful but restricted findings.[7] The latest model for determining the severity of hepatic disease is the albumin-bilirubin (ALBI) score, which combines the blood albumin and bilirubin levels.[8,9] It has recently been shown that in individuals having hepatic cancer, the ALBI score more reliably identifies patients' deaths without necessitating subjective indicators of hepatic failure, such as ascites and encephalopathy.[8,9] The current study has been done to determine the liver function assessment in the patients presented with hepatocellular carcinoma.

MATERIAL AND METHODS

This was a cross-sectional study and was done at the gastroenterology department of Liaquat University Hospital, Hyderabad and Indus Medical College T. M. Khan. The study duration was one year from April 2018 to March 2019. Patients with an age range of 20 to 70 years, both genders, and having hepatocellular carcinoma were included in the study. Patients having other carcinoma and those who did not agree to participate in the study were excluded. Verbal informed consent was taken in all the cases. After taking medical history and complete clinical assessment, a ml blood sample was taken from each participant and was sent to the hospital diagnostic laboratory to assess the liver function test (LFT). Hepatic cirrhosis severity was taken as per the child Pugh classification. The albumin-bilirubin (ALBI) score was used for hepatic function. [8,9] The ALBI score was determined by the following formula: $(\log10 \text{ bilirubin} \times 0.66) + (\text{albumin} \times -0.085)$. The ALBI score was graded as: score ≤ -2.60 as ALBI-1; -2.59 to -1.39 as ALBI-2; and score > -1.39 as ALBI- 3. Data was collected using a self-made research proforma, and it was analyzed using SPSS 26. T- test was used, and a p-value of <0.05 was taken as significant.

RESULTS

A total of 58 cases having HCC were assessed regarding hepatic function. The mean age of the patients was 55.39+12.39 years, avenge duration of CLD was 06.52+3.06 years and the average of HCC duration was 2.24+0.75 years. Males were in the majority 75.9%, and females were 24.1%. Out of all, 34.5% of the cases had comorbidities, and 63.8% of the patients had history of ascites. The majority of the patients (72.4%) had child Pugh class C, 12.1% had child Pugh class B, and 15.5% of the cases had child Pugh class A. Table.1

Table 2 shows that elevated bilirubin levels, albumin levels, and Alpha-fetoprotein levels were significantly associated with the child Pugh class C (p = 0.05).

According to ALBI score, most of the cases (67.3%) had a score > -1.39, 10.3% cases had an ALBI score -2.59 to -1.39 and 22.4% patients had ALBI score ≤ -2.60. Table.3

Table 1: Descriptive statistics of demographic characteristics n=58

Variables		Statistics	
Mean age		55.39+12.39 years	
Mean CLD duration		06.52+3.06 years	
Mean HCC carcinoma duration		2.24+0.75 years	
Gender	Males	44	75.9
	Females	14	24.1
Co-morbidities	Yes	20	34.5
	No	38	65.5
History ascites	Yes	37	63.8
	No	21	36.2
History of hepatic encephalopathy	Yes	29	50.0
	No	29	50.0
Child Pugh classification	A	9	15.5
	B	7	12.1
	C	42	72.4

Table 2: mean bilirubin, albumin and AFP according to C-P class n=58

Variables	C-P	N	Mean	Std. Deviation	p-value
Bilirubin	A	9	1.15	0.88	0.019
	B	7	2.68	1.86	
	C	42	4.58	3.81	
	Total	58	3.82	3.55	
Albumin	A	9	3.18	0.56	0.009
	B	7	2.77	0.62	
	C	42	2.61	0.45	
	Total	58	2.72	0.52	
Alpha fetoprotein level	A	9	47412.22	35381.80	0.001
	B	7	20414.01	34557.33	
	C	36	63112.94	22624.40	
	Total	52	54647.57	30146.70	

C-P= Child Pugh classification

Table 3: Patients distribution according to ALBI score n=58

Variables		Frequency	Percent
ALBI score	1	13	22.4
	2	6	10.3
	3	39	67.3
	Total	58	100.0

DISCUSSION

Worldwide, hepatocellular carcinoma (HCC) is the second leading cause of cancer-related mortality.[10] It may be the most prevalent malignancy in adult males in Pakistan, and it's currently on the increase. Pakistan has one of the highest occurrence rates in the world and contributes considerably to the worldwide burden of hepatitis C, which is proven to be a potential risk for hepatocellular carcinoma.[10] In this study, the mean age of the patients was 55.39+12.39 years, and males were in the majority 75.9%, while females were 24.1%. Consistently, Bhatti et al[11] reported that the patients' average age was 57.9 ± 10.1 years and males were in the majority with a male-to-female ratio of 2.8:1. On the other hand, in the study of Kumar K et al[11] also reported that the patient's mean age was 57.4± 12.06 years and males were in the majority 62.6%.

In this study, the majority of the patients 72.4% had child Pugh class C, 12.1% had child Pugh class B, and 15.5% of the cases had child Pugh class A. In the study of Abraham, A et al.,12 reported that the 18 (43.9%) patients had child Pugh class B and 23 (56.1%) cases had child Pugh class C. In an Indian study by Musunuri B et al[13] reported that the Child-Pugh group B was the most common, followed by category A in 45.4% and 41% of the individuals, correspondingly. In the study of Choudhry, A et al[14] reported that the child Pugh class B was most common in 40.2% of the cases, followed by class A 39.2% and class 20.6%. Inconsistently, Mansoor H et al[15] reported that the most of the patients 84%, had child Pugh class A, followed by 11.5% of cases having child Pugh class B, and 4.3% having child Pugh class C.

In this study according to ALBI score, most of the cases (67.3%) had a score > − 1.39, 10.3% of cases had an ALBI score − 2.59 to − 1.39, and 22.4% of patients had an ALBI score ≤ − 2.60. On the other hand, in the study of Lescure C et al[16] reported that the 88 (39.6%) patients with an ALBI score (grade 1), 130 (58.6%) had grade 2 and 4 (1.8%) patients had grade 3. According to the Chen B et al[8] reported that the model of end-stage liver disease (MELD) score and the Child-Pugh score showed a good correlation with the ALBI score. These findings were also related to this study as the child Pugh class C was significantly liked to ALBI grade 3 (p = 0.009). On the other hand, in the study of Nguyen TT et al[17] reported that the ALBI grade 1 was found in 39 (35.4%) of the cases, the ALBI grade 2 was in 66 (59.1%) of the cases, and the ALBI grade 3 was in 6 (5.5%) of the cases, while furthermore, they reported that, with substantial changes in OS, ALBI grades 1 and 2 reduced death risk by 66.4% and 67.3%, respectively, in comparison to ALBI grade 3.[17] Consistently Zhong CR et al[18] demonstrated that the overall among 3540 patients, 2445 (69.1%) patients had ALBI score (grade 1), 1086 (30.7%) had grade 2 and 9 (0.3%) patients had grade 3. The selection of the appropriate treatment protocols is significantly influenced by liver function.[17] Although Zhong CR et al[18] observed that, in comparison to the original ALBI grade, the newly proposed mALBI grade offers a subtler evaluation of liver function to aid clinical decision-making and more accurately predicts the outcome of patients with HCC. It is generally recognized that a number of scoring systems, such as the MELD and Child-Pugh scores, are available to assess the degree of liver failure and forecast the outcome of patients with chronic liver disease.[8] The ascites, prothrombin time, ascites, serum albumin, and the hepatic encephalopathy are the 5 parameters that make up the Child-Pugh score. The reliability of the assessment could be compromised by the very subjective assessment of ascites and encephalopathy.[8,19] However, the ALBI score can be easily determined with a simple, non-invasive blood test, and it is impartially assessed.[8,20] However In the study of Mohammadi H et al[21] observed that, in the context of radioembolization for cases having HCC, usage of the ALBI scoring system to evaluate hepatic function with greater discrimination than the CP classes, and it shows that in this situation, the ALBI grade may be a helpful predictive tool for choosing patients for liver-aimed therapy.[21] This was a very limited sample size study with several other limitations, especially the patients' survival rate not observed according to ALBI stages. However, the results require confirmation in substantial future multi-center and large-scale studies

CONCLUSION

Severe hepatic dysfunction was observed to be frequently high among patients having hepatocellular carcinoma, as most of the cases had child Pugh class C and ALBI stage 3. Pugh class C was also observed to be significantly linked to ALBI stage 3. Due to the extremely small sample size used in this study, the results are not trustworthy. However, further large-scale studies are recommended on such subject.

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