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ORIGINAL ARTICLE

Frequency of Decompensation in Patients with Hepatocellular Carcinoma in Child Pugh Class A Undergoing Trans Arterial Chemoembolization

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ABSTRACT

Objective: To determine the frequency of decompensation in patients with hepatocellular carcinoma in Child Pugh Class A undergoing trans arterial Chemoembolization.

Study Design: Descriptive case series

Place &Duration: Study was conducted at gastroenterology department with collaboration of interventional radiologists Gambat Institute of Medical Science's Khairpur for six months during the time period of November 2020 to April 2021.

Methodology: 218 patients of either sex with hepatocellular carcinoma presenting to Gastroenterology Department fulfilling the inclusion criteria were enrolled in the study. TACE involved injection of a chemotherapeutic agent (doxorubicin) mixed with lipoidol into selectively or super selectively catheterized branches of the arteries feeding the tumor followed by injection of gel foam particles to reinforce the effect of the treatment. Data was used to calculate incidence of decompensation in patients with hepatocellular carcinoma in Child Pugh Class A undergoing transarterial Chemoembolization.

Results: The frequency of decompensation in patients with hepatocellular carcinoma in Child Pugh Class A undergoing transarterial Chemoembolization was 9.2%.

Conclusion: We conclude frequency of decompensation in patients with hepatocellular carcinoma in Child Pugh Class A undergoing transarterial Chemoembolization was 9.2%.

Keywords: Hepatocellular carcinoma, decompensation, chemoembolization

INTRODUCTION

Hepatocellular carcinoma (HCC) is a primary liver cancer that mostly affects individuals with chronic liver disease and cirrhosis. The cell(s) of origin are thought to be hepatic stem cells, but this is still under study. Tumors spread in three ways: locally, intrahepaticly, and distantly [1].

With over 500,000 individuals afflicted, HCC is currently the third largest cause of cancer mortality globally. The incidence of HCC is greatest in Asia and Africa, where the endemic high frequency of hepatitis B and C predisposes to the development of chronic liver disease and, eventually, HCC [2].

HCC presentation has changed dramatically during the last several decades. Previously, HCC was typically diagnosed at an advanced stage with right-upper-quadrant pain, weight loss, and signs of decompensated liver disease; however, as a result of routine screening of patients with known cirrhosis using cross-sectional imaging studies and serum alpha-fetoprotein (AFP) measurements [3], it is now increasingly recognized at a much earlier stage.

HCC is anticipated to become more prevalent in the future years. The peak incidence of HCC caused by hepatitis C virus (HCV) infection is yet to occur [4]. Cirrhosis is also becoming more common in the context of nonalcoholic fatty liver disease (NAFLD), commonly known as nonalcoholic steatohepatitis (NASH). NASH usually develops in the context of obesity, type 2 diabetes, dyslipidemia, and hypertension, and it will likely continue to be a major issue in the United States, given the obesity pandemic [5].

Survival may be enhanced in certain instances, as shown by trans-arterial chemoembolization (TACE). As a result, it is critical to comprehend the variables that predict survival even in such situations. Previous studies identified three groups of prognostic factors for survival in patients with HCC: (a) demographic characteristics such as age and gender; (b) factors related to HCC such as tumor size, number of nodules, vascular invasion, the presence of a tumor capsule, or metastasis; and (c) factors related to underlying liver disease severity and synthetic drugs.

In HCC, the Child-Pugh classification is a favorable predictive predictor. The Child-Pugh score was established about 50 years ago to predict the prognosis of patients with liver cirrhosis following surgery for portal hypertension (portocaval shunting, esophageal transection) [7]. The initial score was significantly changed subsequently and now contains five variables: degree of encephalopathy, ascites, serum bilirubin, albumin, and prothrombin time [8]. Instead of prothrombin time, prothrombin index or international normalized ratio (INR) are sometimes utilized. The 1-year survival rates for stages A, B, and C are about 95%, 80%, and 44%, respectively [9].

Although HCC is curable in its early stages, it is nevertheless linked with an elevated death rate. The most important therapy remains surgery, including liver transplantation (LT), although survival is linked to the number of tumor foci, tumor size, and underlying liver

function (defined by child-Pugh class). Radiofrequency (RF) tumor ablation is an alternative option for individuals who are not candidates for resection or liver transplant (LT), a bridge treatment for instances awaiting hepatic transplant, and is regarded more suitable than ethanol injection. When tumors near major blood arteries are too close to major blood vessels for RF, percutaneous ethanol is a possibility. Transarterial chemoembolization (TACE) is an additional treatment option for unrespectable malignancies that improves survival [10].

MATERIALS AND METHODS

This study was conducted at Department of Gastroenterology with collaboration of interventional radiologists Gambat Institute of Medical Science's Khairpur for six months during the time period of November 2020 to April 2021. Total 218 patients of either sex with hepatocellular carcinoma and are subjected to TACE at the time of presentation were enrolled in this study. Patients' ages were ranging between 18 to 70 years. After taking written informed consent, patients' detailed demographics including age, sex, BMI, duration of disease were recorded. Patients with prior locoregional therapy (including those having multiple TACE treatments), systemic therapy and/or surgical intervention (liver resection or orthotopic liver transplantation), main portal vein Thrombosis (on CT scan), and patients with renal insufficiency were excluded.

TACE involved injection of a chemotherapeutic agent (doxorubicin) mixed with lipoidol into selectively or super selectively catheterized branches of the arteries feeding the tumor followed by injection of gelfoam particles to reinforce the effect of the treatment. The procedure was performed at the Radiology Department. Ultasonography for the presence of ascites, endoscopy for the presence of esophageal varices and serum ammonia levels was recorded at baseline. These parameters were assessed again at 6 weeks post TACE to ascertain the incidence of decompensation (as per operational definition)

Data was collected and compiled in the computer SPSS version 20 for windows. Quantitative variables include age and duration of liver disease and were be expressed as mean ± standard deviation. Qualitative variables include gender and incidence of decompensation and were expressed as frequencies and percentages. Data was used to calculate incidence of decompensation in patients with hepatocellular carcinoma in Child Pugh Class A undergoing transarterial Chemoembolization. Data was stratified with respect to age, gender, and duration of liver disease. Post stratification chi-square was applied and a p-value ≤0.05 was considered significant.

RESULTS

The mean age of the patients was 56.36±8.82 years. 57.8% (n=126) were males while 42.2 % (n=92) were females. The mean duration of liver disease was 5.3±2.13 years. Mean BMI was 22.49±2.71 kg/m^2. (Table 1)

The frequency of decompensation in patients with hepatocellular carcinoma in Child Pugh Class A undergoing transarterial chemoembolization was 9.2% (n=20). (Table 2)

When stratified with respect to gender, 5.5% (n=7) of male patients had decompensation, whereas 14.1% (n=13) of female patients had decompensation with p-value 0.030. (Table No. 3)

Table No 1: Baseline Details of all the patients

Variables	Frequency No.	%age
Mean Age (years)	56.36±8.82	-
Mean BMI (kg/m)	22.49±2.71	-
Disease Duration	5.3±2.13	-
Gender		
Male	126	57.80%
Female	92	42.20%

Table No 2: Frequency Of Decompensation Of Liver Disease In Hcc After Chemoembolization

Decompensation	Frequency No.	%age
Yes	20	9.2
No	198	90.8

Table No 3: Stratification of Frequency of Decompensation of Liver Disease with Respect to Gender

		Decompensation		Total
		Yes	No	
Gender	**Male**	7	119	126
	Female	13	79	92
Total		20	198	218

When stratified with respect to age, 30.9% (n=13) of patients aged 18-45 years had decompensation, whereas 3.9% (n=7) of patients aged 50-80 years had proteinuria with p-value 0.000. (Table No.4)

Table No 4: Stratification of Frequency of Decompensation of Liver Disease with Respect to Age

		Decompensation		Total
		Yes	No	
Age (years)	**18-45**	13	29	42
	46-70	7	169	176
Total		20	198	218

When stratified with respect to duration of liver disease, no patient with duration less than 7 years had decompensation, whereas all the patients having decompensation had duration of disease greater than 7 years with p-value 0.000. (Table No. 5)

Table No 5: Stratification of Frequency of Decompensation of Liver Disease with Respect to Duration of Disease

		Decompensation		Total
		Yes	No	
Duration of disease(years)	**<7 years**	0	138	138
	>7 years	20	60	80
Total		20	198	218

DISCUSSION

This study was carried out to calculate the frequency of decompensation in patients with hepatocellular carcinoma in Child Pugh Class A undergoing transarterial chemoembolization. A locoregional therapy (LRT), transarterial chemoembolization (TACE), is generally recommended as first-line treatment for intermediate-stage HCC (BCLC stage B) [10-11]. In addition, surgical resection, percutaneous ablation, and liver transplantation are sometimes used in individuals with BCLC stage B who

have been carefully chosen. For patients with advanced HCC (BCLC stage C) or tumors that are advancing on LRT, the oral multikinase inhibitor sorafenib is the current standard systemic therapy [12]. It is also an additional option for individuals with intermediate-stage HCC as first-line systemic treatment.

The mean age of the patients was 56.36 ± 8.82 years. 19.2 % (n=42) of the patients had age 18-45 years, while 80.8 % (n=176) of patients had age 46-70 years. Most of the patients in our population had age greater than 45 years. A study by Muhammad Sohaib Asghar et al [13] with aimed to report the efficacy of TACE and alterations in laboratory parameters in patients of hepatocellular carcinoma before and after undergoing TACE in lieu with size >3 cm or <3 cm of the tumor, in their study the mean age of patients was 53.89 ± 10.58 years.

Gender distribution shows that 57.8% (n=126) were males while 42.2 % (n=92) were females. There was more or less equal gender predisposition. These results showed similarity to many of previous studies in which male patients population was high 60 to 70% as compared to females whom had chronic liver diseases [14-15].

The mean duration of liver disease was 5.3 ± 2.13. The mean BMI was 22.49 ± 2.71. Most of the patients in our study were malnourished.

The frequency of decompensation in patients with hepatocellular carcinoma in Child Pugh Class A undergoing transarterial chemoembolization was 9.2% (n=20). This incidence is in comparison with previous studies [16-17], with slight increase in frequency in our study. Further studies need to be done to evaluate the cause of this increased frequency. Mohamed A S Kohla et al [18] reported that the statistically significant predictive factors for hepatic decompensation using univariate analysis were found to be baseline lower serum albumin, higher serum α-fetoprotein, more advanced Barcelona Clinic Liver Cancer (BCLC) stage, larger tumour size and a greater number of tumour nodules; with logistic regression, multivariate analysis found that at baseline larger tumour size (p=0.004 at 95% CI), higher serum AFP (p=0.046 at 95% CI) and lower serum albumin (p=0.033 at 95% CI) predicted decompensation; BCLC stage, number of tumour nodules and pre-TACE bilirubin did not predict changes in liver function.

Portal hypertension reflects the severity of cirrhosis, which is a well-known risk factor related to late recurrence in patients with HCC. The mechanism of late recurrence can be explained by multicentric recurrence in the remnant liver (19-20). Regarding surgical resection, liver fibrosis and significant portal hypertension are risk factors for postoperative hepatic decompensation, which is a serious complication after resection (21).

When stratified with respect to gender, 5.5% (n=7) of male patients had decompensation, whereas 14.1% (n=13) of female patients had decompensation with p-value 0.030. Females were more prone to develop decompensation as compare to males.

When stratified with respect to age, 30.9% (n=13) of patients aged 18-45 years had decompensation, whereas 3.9% (n=7) of patients aged 50-80 years had proteinuria with p-value 0.000. Surprisingly young patients had increased frequency of decompensation as compared to elderly patients.

When stratified with respect to duration of liver disease, no patient with duration less than 7 years had decompensation, whereas all the patients having decompensation had duration of disease greater than 7 years with p-value 0.000. Duration of liver disease was a strong predictor of decompensation because all patients developing decompensation had disease for more than 7 years. A previous study demonstrated that increase in duration of HCC significantly associated with decompensation after TACE [22].

CONCLUSION

We conclude that the frequency of decompensation in patients with hepatocellular carcinoma in Child Pugh Class A undergoing transarterial chemoembolization is 9.2%.

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