

# Frequency of High MELD Score in Cirrhotic Patients undergoing Liver Resection due to Hepatocellular Carcinoma

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## ABSTRACT

**Objective:** To determine the frequency of high MELD score in cirrhotic patients undergoing liver resection due to hepatocellular carcinoma also compare the frequency of mortality in patients with high or low MELD score.

**Study Design:** Cross sectional study

**Place and Duration:** Department of Gastroenterology, Shaikh Zayed Hospital, Lahore. Duration: 6months i.e. 23 12-2017 to 22-06-2018.

**Methodology:** 75 patients were enrolled. Then blood sample was obtained. Reports assessed and MELD score calculated. Scores were labeled as high or low. Patients underwent liver resection according to BCLC. The mortality was noted. All the collected data was entered and analyzed on SPSS version 22.

**Results:** In this study out of total 75 cases 60 were males and 15 females. The mean age of patients was 39.44±9.76 years, male to female ratio was 4:1. Low MELD class was noted in 45 (60%) cases and high MELD class noted in 30(40%) cases. Mortality occurred in 27(36%) cases. Insignificant difference found between the MELD class with mortality.

**Conclusion:** High MELD score was seen in 40% cirrhotic patients undergoing liver resection due to HCC. Post HCC resection, mortality occurred in 36% patients within three months of surgery. No significant association was found between the mortality and MELD score.

**Keywords:** MELD, Hepatocellular Carcinoma, Mortality, Cirrhosis

## INTRODUCTION

HCC is a cancer of the liver that affects millions of people each year. It occurs at a rate of 1 in 500000 people and is closely linked to cirrhosis [1]. Surgical excision is the mainstay of treatment for patients with a single HCC and good liver function [2]. In patients with severe under-lying liver disease having liver resection, surgical approaches and peri-operative care have improved post-operative outcomes [3-5]. Due to the impaired function of the liver remnant, patients who have undergone liver resection and are cirrhotic are still at risk of hepatic failure. In order to predict the outcome of hepatic resection cases, a comprehensive evaluation of liver functions must be performed prior to surgery [6].

End-stage liver disease model (MELD) is a basic approach for describing liver function by assessing simple creatinine levels, international normalised ratios, total bilirubin and salt levels. cirrhotic individuals undergoing a trans-jugular intrahepatic porto-systemic shunt or surgical resection can use the MELD score to estimate their prognosis[7]. Patients with cirrhosis who undergo surgical operations can be assigned a priority on liver transplant waiting lists, and their post-operative outcomes can be predicted [8]. A recent study in Greece looked at 69 people who had their livers removed because to HCC. In 43 (62.3 percent) cases, the MELD score was below 9, but in 26 (30.7 percent) cases, the MELD score was above 9, indicating a high MELD. Patients with MELD >9.6 had a 50% mortality rate, compared to 10% mortality in those with MELD 9.6. An investigation conducted recently in Brazil on 138 patients, of which 28 had cirrhosis-related HCC, found

that the survival rates for HCC patients after three months and a year were 85.7% and 78.6%, respectively. According to Osama et al., the death rate was 37% when MELD was greater than 9, while the rate was only 22% when MELD was lower ( $p=0.01$ ) [10].

The aim of this study was to assess the frequency of high MELD score in HCC patients undergoing liver resection and prognosis through analysis of the relationship between MELD score and occurrence of mortality within three months after liver resection. There is variation in the results of the studies that are published on international level and no local study is present regarding the efficiency of MELD score. This variability in survival rates can be due to variability of risk factors and differences in management plans internationally. That's why this study was planned to see the 3-month survival in such cases in our population. Moreover, MELD will also help in prognosis of patients, whether it is good to undergo liver resection when MELD is high as the survival rate is poor with high MELD score. So it will help the surgeons to decide whether to do liver resection in cases of high MELD score.

## MATERIALS AND METHODS

This cross-sectional study was conducted at Department of Gastroenterology, Shaikh Zayed Hospital, Lahore. Duration: 6months i.e. 23 12-2017 to 22-06-2018. Total 75 cirrhotic patients of both genders having ages between 20-60 years diagnosed with HCC undergoing liver resection under general anesthesia were enrolled in this study. Patients with HCC but without cirrhosis (assessed by history and record), renal (creatinine>1.2mg/dl and on

hemodialysis) or cardiac disease (MI, PCI or CABG, valvular disease, assessed on medical record) were excluded.

Informed consent was taken. Demographic information like age, gender, BMI, duration of cirrhosis and HCC diagnosis was taken. Then blood samples were obtained by using 5cc BD syringe and were sent to the laboratory of the hospital for assessment of serum Creatinine, international normalized ratio and serum total bilirubin level. Reports assessed and MELD score calculated. Scores were defined as high or low (as per operational definition) and two groups were formed. Then all patients underwent liver resection according to BCLC (Barcelona Clinic Liver Cancer) staging system. All surgeries were done by a single surgical team with assistance of researcher. After surgery patients shifted to post-surgical ward and were followed-up there. Then patient discharged and followed-up in OPD for three months. Post surgically patient's survival was noted (as per operational definition). All this information was recorded on proforma (attached).

Data was entered and analyzed using SPSS v 22.0. Quantitative variables like age, BMI, duration of HCC and MELD Score was expressed by Means and SD. Frequency and percentage was calculated for qualitative variables like gender, high or low MELD score and mortality. High and low MELD score groups were compared for mortality by using Chi-square test. p-value ≤ 0.05 considered significant.

**RESULTS**

The mean age of the patients was 39.44±9.76 years with minimum and maximum ages of 25 & 60 years respectively. 60(80%) patients were male and 15(20%) patients were females. Male to female ratio of the patients was 3:1. Mean duration of HCC was 6.81±2.78 months while minimum and maximum value of duration of HCC was 2 & 15 months respectively. Mean BMI of the patients was 21.50±4.05 kg/m<sup>2</sup> with minimum and maximum values of 15.50&29.90 kg/m<sup>2</sup> respectively. The major extent of resection was found in 61(81.33%) patients and minor extent of resection was found in 14(18.67%) patients. Mean MELD score of the patients was 9.41±3.20 with minimum and maximum values of 5 & 15 score respectively. (Table 1)

Table No 1: Baseline characteristics of all the included patients

Variables	Frequency No.	%age
Mean age (yrs)	39.44±9.76	-
Disease Duration (months)	6.81±2.78	-
Mean BMI (kg/m)	21.50±4.05	
Mean MELD score	9.41±3.20	
<b>Gender</b>		
Male	60	80
Female	15	20
<b>Extent of Resection</b>		
Major	61	81.33
Minor	14	18.67

In this study low MELD class was noted in 45 (60%) patients and high MELD class was noted in 30(40%) patients. (Figure 1)

In this study the mortality occurred in 27(36%) patients and it didn't occur in 48(64%) patients. (Figure 2)

Figure 1: Frequency of high and low MELD score

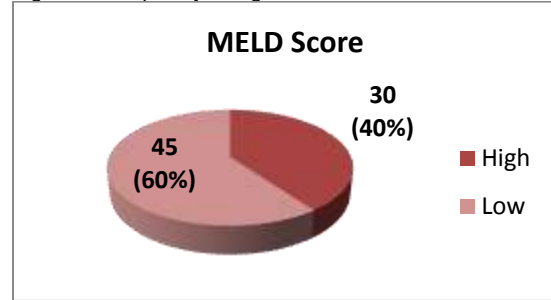
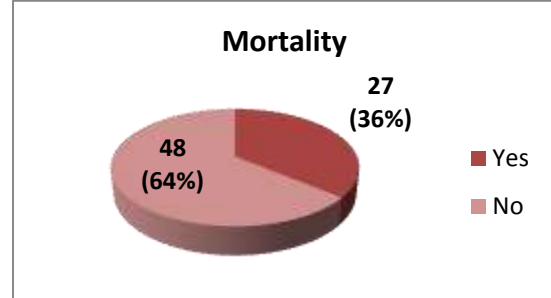


Figure 2: Frequency of mortality among all the patients



According to this study the low MELD class patients were 45 in which mortality occurred in 13 cases, similarly the high MELD class patients were 30 in which mortality occurred in 14 cases. Statistically insignificant difference found between the mortality with MELD class i.e. p- value=0.116. (Table 2)

Table No 2: Comparison of mortality with MELD

	Mortality	Mortality		Total
		Yes	No	
MELD class	Low	13	32	45
	High	14	16	30
Total		27	48	75

Chi value=2.47 p-value=0.116

**DISCUSSION**

One of the most serious side effects of a hepatectomy is liver failure. The MELD score was developed to assess cirrhotic patients' hepatic function reserve. Three objective and easily measured parameters: creatinine levels, the International Normalized Ratio, and total bilirubin levels. For patients with cirrhosis who are having a transjugular intrahepatic portosystemic shunt, the MELD score is used to predict survival [11-13].

In our study, 30 (40 percent) of the patients had a high MELD score, and the mean MELD score was 9.41±3.20. Patients with 61(81.33 percent) major resections and 14(18.67 percent) minor resections had the most extensive resections. Thirty-seven percent of patients who died had a low MELD score, compared to 40 percent of those who had a high MELD score (p-value:0.116).

For patients with a MELD score of 11 or lower, the mortality rate following abdominal surgery has been reported to be between 5 and 10 percent, 25 to 54 percent, and 55 to 80 percent [14, 15].

It was discovered by H Osama and colleagues [16] that 11 major and 49 minor resections were carried out in this case. It was 8.3 percent for those who died within 30 days after being admitted to the hospital. Perioperative

mortality was shown to be linked with MELD values less than 9 (2.6 percent) compared to MELD values more than 9 (20 percent) ( $P < 0.05$ ). A total of 53.3 percent of patients suffered from morbidity, with 36.6 percent suffering from MELD greater than 9 compared to 16.6 percent suffering from MELD less than 9.

To the best of their ability, Torzilli et al [17] demonstrated that when cirrhosis is diagnosed, 50% of patients undergoing liver resection in the presence of cirrhosis are resected outside of the BCLC criteria, with 5-year overall survival rates of 57 percent and 38 percent for BCLC B and BCLC C, respectively. When one study looked at liver resections in patients with advanced cirrhosis and found an overall mortality rate of 16 percent, the researchers determined that a MELD score of 9 was the "cut-off" point: no patients with a MELD score of less than 9 died during the perioperative period, while a 29 percent mortality rate was found in patients with 9 or more points [18].

A recent study was done in Greece on 69 cases of HCC undergoing liver resection. Low MELD score ( $\leq 9$ ) was observed in 43(62.3%) cases while high MELD ( $>9$ ) in 26(37.7%) cases. It was seen that MELD  $\leq 9$  was associated with 10% mortality and 51% with MELD  $>9.6$ . In a recent study conducted in Brazil on 138 cases, out of which 28 had cirrhosis related HCC and it was reported that, three months and one year survival rates were 85.7% and 78.6% respectively for HCC patients [9].

After hepatectomy, one study by Spiros G. Delis et al [6] found that the MELD score seemed to predict the outcome of cirrhotic patients with HCC compared to the general population. There were 17 major and 52 minor resections carried out. The mortality rate at thirty days was 7.2 percent. When MELD was less than 9, there was no peri-operative mortality, however when MELD was greater than 9, there was 19 percent ( $P < 0.02$ ). The overall morbidity rate was 36.23 percent; 48 percent when MELD was greater than 9 compared to 25 percent when MELD was less than 9 ( $P < 0.02$ ).

The reliability of the MELD score in predicting morbidity and death following elective liver resection in patients with minimal or no signs of liver disease has been questioned [19].

## CONCLUSION

According to this study the high MELD score in cirrhotic patients undergoing liver resection due to HCC was noted in 40% patients and the mortality occurred in 36% patients. No significant association was found between both low and high MELD class for mortality, however, the mortality rate was high in patients with high MELD score. Thus in future, further researches are required to confirm the evidence. The results are insignificant may be due to small sample size. So further studies should be done on large sample size.

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