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Research Article

Severity and Mortality Prediction in Chronic Liver Disease using Child PUGH and MELD scales

[1]Musarrat Rauf*,[1] Ayesha Bibi, [2]Saifullah Mehsud and [2]M.Shafiq Khan

[1]Department of Dentistry Ayub Medical College Abbottabad.
[2]Department of Pharmaceutical Sciences,
Abbotabad University of Science & Technology Abbotabad.

*Corresponding author: Dr Musarrat Rauf Burki,
Assist Professor Community Dentistry,Ayub Medical College Abbottabad ,
Email Address: * drmusarratburki@gmail.com Cell# 03345093448

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ABSTRACT

Background: accounting for 3.5% of all deaths worldwide, Cirrhosis is the 11th most common cause of death and liver cancer is playing its role by being 16th in the instigation of death .at present liver transplantation is the second most prevalent solid organ transplantation, yet at current rate less than 10% of global transplantation needs are met .Pakistan carries one of the world's highest burden of end stage liver disease and mortality due to liver failure and hepatocellular carcinomas (HCC) increasing the demand of liver transplantation (LTX). The research was conducted to determine the MELD score (Model for end stage of Liver disease) for quantifying end stage liver disease intended for transplant planning and CHILDPUGH score to sestimate severity of liver cirrhosis

Study design: Cross-sectional study.

Methods: Study was conducted in the three hospitals in Rawalpindi namely Holy Family Hospital (CMH), Benazir Hospital and District civil Hospital Fawara chowk. A total of 400 patients who had given informed consent and already had established diagnosis of CLD were included in it. Data was collected from these hospitals to calculate the MELD score & CHILDPUGH score & then determine mean range of MELD score and subsequent CHILDPUGH score in Class wise. Frequencies, percentages and p-values were reported for various categorical variables

Result: Child Class A: 5 to 6 points**,** Life expectancy: 15 to 20 years**,** Abdominal surgery Peri-operative mortality: 10%. Child Class B: 7 to 9 points, Indicated for liver transplantation evaluation, abdominal surgery peri-operative mortality: 30%.

Conclusion: 400 Patient were selected for study belonging to the ditrict Rawalpindi. The mean data of MELD score & CHILDPUGH score is drawn on the chart which shows that as the mean score is decreased the mortality rate due to liver disease is also decreased

Keywords: Chronic liver disease, *MELD ,PUGH score*

INTRODUCTION

Worldwide liver disease accounts for approximately 2 million deaths per year, equally distributing it by 1 million due to complications of cirrhosis and 1 million due to viral hepatitis and hepatocellular carcinoma. Cirrhosis is currently the 11th most common cause of death globally and liver cancer is the 16th leading cause of death; teaming up, they account for 3.5% of all deaths worldwide. It is within the top 20 causes of disability-adjusted life years and years of life lost, accounting for 1.6% and 2.1% of the worldwide burden. About 2 billion people consume alcohol worldwide and more than75 million are diagnosed with alcohol-use disorders and are at risk of alcohol-associated liver disease .Another major cause obesity ; engulfs 2 billion adults and over 400 million have diabetes; both of which are risk factors for non-alcoholic fatty liver disease and hepatocellular carcinoma. The global prevalence of viral hepatitis remains high, while drug-induced liver injury continues to increase as a major cause of acute hepatitis.(1)

Hepatitis is one of the 10 reportable diseases in Pakistan .Among Hepatitis, Hepatitis C Virus (HCV) is one of the commonest causes of chronic liver disease in Pakistan leading to be the principal indications for liver transplant. As per WHO Pakistan is in 2nd position in prevalence of Hepatitis C after Egypt and more than 10 million people are presumed to be infected with HCV1.One of the major cause of hepatitis transmission in Pakistan, is blood transfusion and therapeutic parenteral injections with reusable glass syringes.(2)

Liver transplantation is the second most common solid organ transplantation, yet less than 10% of global transplantation needs are met at current rates. Although these numbers are decreasing, they bring to light an important opportunity to improve public health given that most causes of liver diseases are preventable.

Liver cirrhosis is the extensive scarring (fibrosis) of the liver caused by long-term injury. The damage is due to persistent and ongoing inflammation in response to chronic liver injury. Though liver is included in one of highest ability in human tissue to repair itself. However, as it gradually builds up scar tissue, it is less able to function properly. Over time, as the amount of scarring increases and the circulatory flow to the liver is decreased, leading to compromised essential liver functions.

. Several liver diseases fall under this category, including :

- Cirrhosis of the liver
- Fibrosis of the liver

The common signs and symptoms are weakness, fatigability, disturbed sleep, muscle cramps, ItchingLoss of appetiteand weight loss. Easy bruising,jaundice, Spider angioma ,edema ,ascites. Many of these symptoms are caused by portal hypertension, in which scar tissue partially blocks the normal flow of blood to the liver.

The MELD & Child Pugh Scoring Scales were determined for 400 cases. The severity in Chronic Liver Disease Patients was determined in the study. The mortality ratio was determined using the scores of 400 subjects. The MELD score for 10-19 with 6.0% mortality was in 270 patients. The number of patients following in Class B under Child Pugh scale was 240; these patients have 81% survival chances for the one year and 57% survival chances for two years. The MELD score, which incorporates the serum bilirubin and creatinine levels and the INR, is also a measure of mortality risk in patients with end stage liver disease and is particularly useful for predicting short and intermediate term survival and determining allocation priorities for donor livers.

METHODOLOGY

A cross sectional study was conducted. The data were collected from 3 different Hospital of Rawalpindi region i.e. Holy Family Hospital, Benazir Hospital & district civil Hospital Fawara chowk Rawalpindi. **Duration:** November 2017 to September 2018.

Study design: Cross-sectional study.

Sampling size: The sample size has been calculated using Rao software calculator for sample size determination, which came out to be 400.

Sample selection Inclusion criteria:

• Those patients giving informed consent.

• Those who already had the established diagnosis of CLD on the basis of history, physical examination (presence of ascites, varices, splenomegaly), laboratory findings (decreased serum albumin, increased prothrombin time, altered liver function tests), and ultrasound findings (portal hypertension, splenomegaly, varices, ascites), presenting to the hospital with signs and symptoms of decompensation of CLD.

• Those having chronic liver disease due to chronic hepatitis and alcoholism.

Patients were selected and divided into 2 classes. Two scoring scales were employed randomly :

✓ MELD (Model For End-Stage Liver Disease (12 and older):

Calculation of MELD score helps to quantify end-stage liver disease for transplant planning.

These MELD score are,

Serum Bilirubin	mg/dL
INR	
Serum Creatinine	mg/dL
Has the patient had dialysis at least twice in the past week?	Yes
MELD Score	points

✓ and ChildPugh Score for Cirrhosis Mortality

Calculation of ChildPugh Score helps to estimate cirrhosis severity.

These score are,

Total Bilirubin	<2 mg/dL +1 2-3 mg/dL (34-50 µmol/L) +2 >3 mg/dL (>50 µmol/L) +3
Albumin	>3.5 g/dL (>35 g/L) +1 2.8-3.5 g/dL (28-35 g/L) +2 <2.8 g/dL +3
INR	<1.7 +1 1.7-2.2 +2 >2.2 +3
Ascites	No Ascites +1 Ascites, Medically Controlled +2 Ascites, Poorly Controlled +3
Encephalopathy	No Encephalopathy +1 Encephalopathy, Medically Controlled +2 Encephalopathy, Poorly Controlled +3
Score	points

Total numbers of patient data analyzed were 400; out of 250 were male patients and 150 female patients. The results are given below: In MELD Score in hospitalized patients, the three month mortality is: The number of Patients with MELD Score 40 or more was Zero, between 30 and 39 was 30, mortality due to CLD in such patients is 52.6%, Patients with MELD Score between 20 and 29 was 60, mortality due to CLD in such patients is 19.6%, Patients with MELD Score between 10 and 19 was 270, mortality due

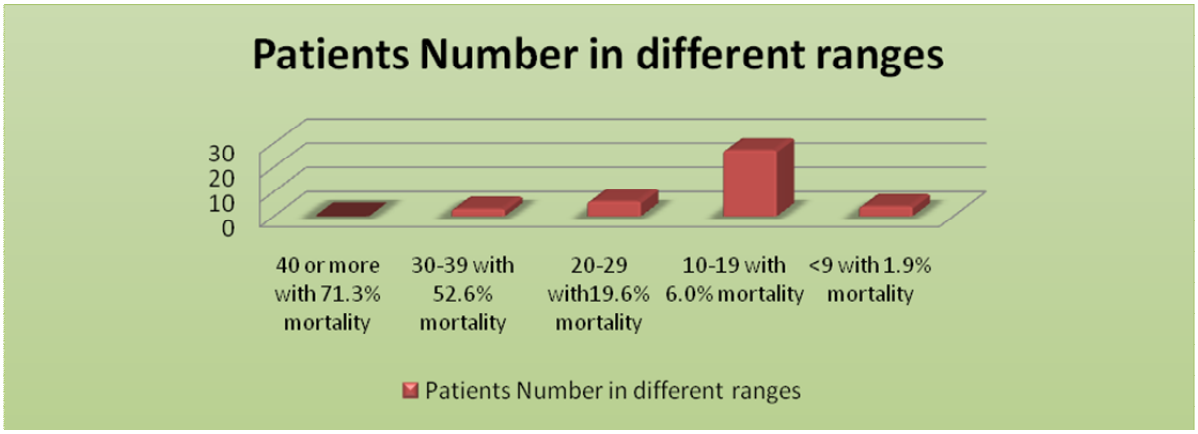
to CLD in such patients is 6.0% and number of Patients with MELD Score less than 9 was 40, mortality due to CLD in such patients is 1.9%.

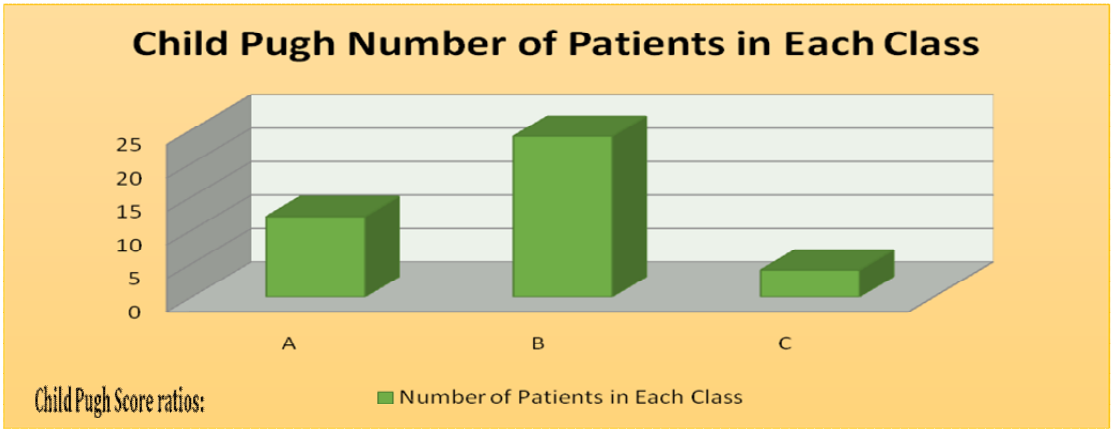
Chronic liver disease is classified into ChildPugh class A to C, employing the added score from above.The number of patients following in Class A were 120, these patients have 100% survival chances for the one year and 85% survival chances for two years, number of patients following in Class B were 240, these patients have 81% survival chances for the one year and 57% survival chances for two years and number of patients following in Class C were 40, these patients have 45% survival chances for the one year and 35% survival chances for two years.

MELD Score ratios:

Range	Number of Patients
40 or more with 71.3% mortality	0
30-39 with 52.6% mortality	30
20-29 with19.6% mortality	60
10-19 with 6.0% mortality	270
<9 with 1.9% mortality	40

Class	Number of Patients
A	12
B	24
C	4





DISCUSSION:

ChildPugh score remains a simple and effective tool for the prognostic assessment of cirrhotic patients at bedside and can still be used in clinical practice. MELD, and especially MELDNa, should be reserved for patients with decompensated cirrhosis. Although, the best system for organ allocation is still a controversial issue.

The model for end-stage liver disease (MELD), which employs objective variables, statistical weighting and a continuous scale, has replaced the Child-Pugh classification as the scoring system of choice in several liver transplant.s

MELD may be used in selection of patients for surgery other than liver transplantation and in determining optimal treatment for patients with hepatocellular carcinoma who are not candidates for liver transplantation. Despite the many advantages of the MELD score, there are approximately 15%-20% of patients whose survival cannot be accurately predicted by the MELD score. It is possible that the addition of variables that are better determinants of liver and renal function may improve the predictive accuracy of the model.

LD liver transplantation can provide excellent graft function and survival rates in high MELD score recipients. Thus, when deceased donor organs are scare, a high MELD score alone should not be an absolute contraindication to living liver donation.

Superiority of the model for end-stage liver disease (MELD) over the Child-Pugh score for the prediction of outcome in patients with chronic liver disease is still debated.

In liver transplant candidates, the severity of liver disease assessed by the MELD score was not predictive of quality of life. The presence of ascites and or encephalopathy was significantly associated with poor quality of life.

The most number of Patients with MELD Score between 10 and 19 was 270 during the study mortality due to CLD in such patients is 6.0% while in Child Pugh Scale most number of patients following in Class B were found to be 240,these patients have 81% survival chances for the one year and 57% survival chances for two years.

CONCLUSION:

It has been concluded from the overall analysis that MELD Score (Model For End-Stage Liver Disease) and Child-Pugh Score for Cirrhosis Mortality and regularly employed in the hospitals to calculate the severity of CLD and Mortality due to CLD although completely relying on these scales is controversial.

The practice of employing Child-Pugh Score for Cirrhosis Mortality is in practice in Hospitals. Although, the best system for organ allocation is still a controversial issue

Interpretation:

Child Class A: 5 to 6 points**,** Life expectancy: 15 to 20 years**,** Abdominal surgery peri-operative mortality: 10%

Child Class B: 7 to 9 points, Indicated for liver transplantation evaluation, abdominal surgery peri-operative mortality: 30%.

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