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Research Article

**ASSOCIATION OF DECOMPENSATED LIVER CIRRHOSIS
PATIENT'S MORTALITY RATE IN THE PRESENCE OR
ABSENCE OF HYONATREMIA AND MELD SCORE (11 – 20)**¹Dr. Sidrat-ul-Muntaha, ²Dr. Sehrish, ³Dr. Muhammad Farqalet¹WMO, BHU Khairay Wala, Choubara, Layyah²WMO-IRMNCH, RHC Kahlian Sialkot³Medical Officer, BHU Mamoori, D.G Khan**Abstract:**

Objectives: We aimed to determine the hyponatremia and low MELD score frequency in the bracket of (11 – 20) in decompensated liver cirrhosis patients. We also compared the mortality frequency in the chronic liver disease patients who presented MELD score (11 – 20) in the presence or absence of hyponatremia.

Methodology: We secured an approval from an ethical committee of the hospital and we also took consent from the patients. We included all the patients who were diagnosed with decompensated liver cirrhosis from the emergency department and OPD as they were complying with the criteria of the research. Our research sample had been identified with MELD score and hyponatremia. We divided the total research sample into two groups by naming them as Group I and Group II. Group I and II respectively consisted of patients having the level of Sodium (Na) serum (< 135 mEq/l) and in the range of (135 – 145 mEq/l); whereas, the MELD score for both the groups was same that is (11 – 20). In the upcoming period of four months, the rate of mortality was also compared in both the groups. Every month a follow-up checkup was also carried out every week. A Proforma was used for the data collection and record keeping. All the information was collected on proforma. We ensured that our research should not hamper the routine disease management of the patients.

Results: Our research included 250 patients with mean age of (44.97 ± 9.06) years. We included 129 males (51.6%) and 121 females (48.4%). Research had a dominance of males over females. Low MELD score frequency in the absence and presence of hyponatremia was reported in the outcomes of this research as 58 with hyponatremia cases (23.2%); whereas, 66 cases were without hyponatremia (26.4%). We also observed that 126 cases (50.4%) had no low MELD score. Mortality rate was also compared and we observed that mortality was present in 58 cases in the presence and absence of hyponatremia in the low MELD score; with hyponatremia 23 low MELD score cases (39.65%); whereas, 13 cases of without hyponatremia (19.70%) with low MELD score (P-value = 0.01).

Conclusion: It is concluded that decompensated liver cirrhosis patient's mortality rate with hyponatremia and MELD score (11 – 20) was more than the patients without hyponatremia; however, for an optimum disease management these patients were referred such as in at an early stage of a liver transplant.

Keywords: Low MELD Score, Decompensated Liver Cirrhosis, Mortality and Hyponatremia.

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INTRODUCTION:

Higher rates of mortality are commonly associated with the end-stage liver disease all over the world. With the ongoing advancements in the field of medical science quality of life and survival has been improved in the cases of the end-stage liver disease. End-stage liver disease prognosis has also been tremendously improved over the past few years and new scores and models have also been introduced. MELD and Child-Pugh are repeatedly utilised scores in this regard [1].

For the first time back in 2002, USA adopted MELD score as a standard tool to locate the organs in the patients of liver transplant diagnosed with end-stage liver disease. Overall mortality rate was reduced with the implementation of the MELD system as it has an impact on the liver transplantation and about fifteen percent mortality was reduced [2].

MELD is consistently improving since it has been first utilized. For the onward improvement alteration in the coefficients of the present MELD is carried out and new variables are also included in the formula of MELD. The testing of both the methods was carried out independently. Survival rate improves with the inclusion of sodium (Na) serum in the MELD score. It has been reported through numerous research studies that decreased level of sodium (Na) serum has an association with liver transplant patient's mortality. With the increase in the MELD, the hyponatremia effect decreases in the awaiting cases. The reported mortality reduction is about seven percent [3, 4].

Dilutional hyponatremia is also reported in the patients of cirrhosis. The anti-diuretic hormone is released through a systemic arterial vasodilation. Dilution hyponatremia is also induced as a result of this phenomenon. The mechanisms activity is also associated with the portal hypertension severity. In this perspective, hyponatremia is a potent indirect indicator of portal hypertension in the course of cirrhosis. Severe complications are linked with hyponatremia in the patients of liver cirrhosis which include hepatorenal syndrome, ascites and as a result, prolonged hospitalization trend is induced [5]. It is, therefore, severe outcomes are predicted with the decreased value of sodium during hyponatremia which also indicates a rate of survival at the third and twelfth month of treatment. Deitelz Weig reported readmission of patients of cirrhosis within the timespan of thirty days after being once discharged (25.1% Versus 11.0%) and a significant P-value of (< 0.001) [6]. Hauman reported about hyponatremia that it is a good marker of an early mortality in patients, who have low MELD score (under 20); a mortality

rate of 33.5% with low value of Na serum was also compared with normal Na serum of 5.8% at an interval of 180 days of treatment [2]. Predictive accuracy can be improved with the combination of MELD score and serum sodium (Na) values specifically in those patients who have been reported a low MELD score. It is also a fact that is reported in various studies; if MELD score increases than a prediction of mortality are less disturbed with the level of sodium (Na) serum [7].

So, we aimed to determine the hyponatremia and low MELD score frequency in the bracket of (11 – 20) in decompensated liver cirrhosis patients. We also compared the mortality frequency in the chronic liver disease patients who presented MELD score (11 – 20) in the presence or absence of hyponatremia.

METHODOLOGY:

Our research sample was of 250 decompensated liver cirrhosis patients in the age bracket of 20 – 60 years. We included both male and female patients but males were in dominance. Any gender having renal dysfunction that does not attribute to cirrhosis but attributes to various other diseases, intrinsic renal disease; for instance, diseases like polycystic kidney, heart failure evidence that does not include hyponatremia, cirrhotic cardiomyopathy because of the related reasons. We did not include all the patients who were managed with a dose of salt-free albumin injection in the timeframe of twenty-four hours.

We secured an approval from an ethical committee of the hospital and we also took consent from the patients. We included all the patients who were diagnosed with decompensated liver cirrhosis from the emergency department and OPD as they were complying with the criteria of the research. Our research sample had been identified with MELD score and hyponatremia. We divided the total research sample into two groups by naming them as Group I and Group II. Group I and II respectively consisted of patients having the level of Sodium (Na) serum (< 135 mEq/l) and in the range of (135 – 145 mEq/l); whereas, the MELD score for both the groups was same that is (11 – 20). In the upcoming period of four months, the rate of mortality was also compared in both the groups. Every month a follow-up checkup was also carried out every week. A Performa was used for the data collection and record keeping. All the information was collected on proforma. We ensured that our research should not hamper the routine disease management of the patients.

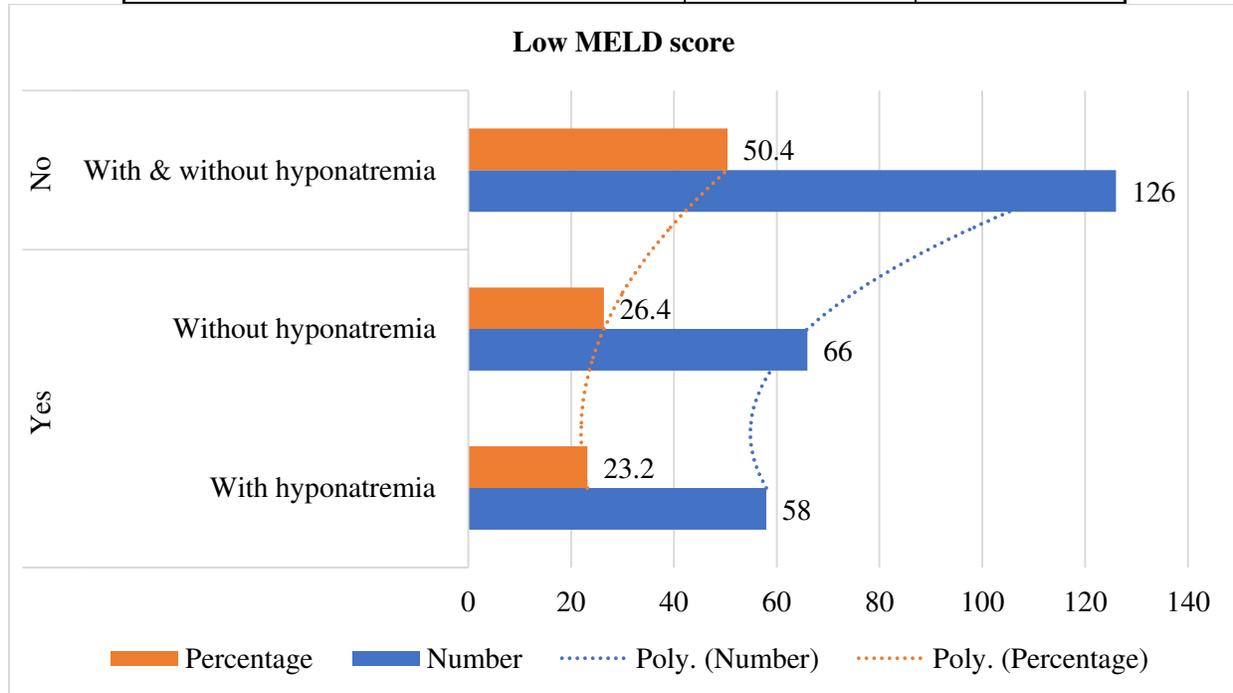
RESULTS:

Our research included 250 patients with mean age of (44.97 ± 9.06) years. We included 129 males (51.6%) and 121 females (48.4%). Research had a dominance of males over females. Low MELD score frequency in the absence and presence of hyponatremia was reported in the outcomes of this research as 58 with hyponatremia cases (23.2%); whereas, 66 cases were without hyponatremia (26.4%). We also observed that 126 cases (50.4%) had no low MELD score.

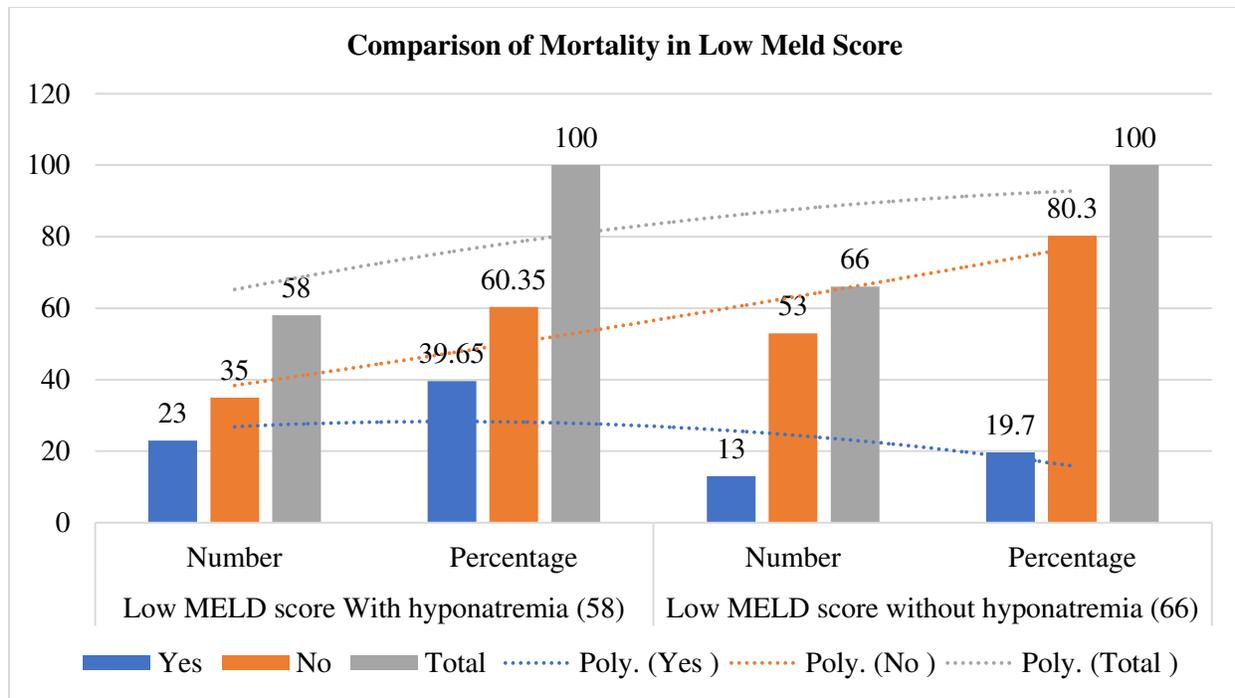
Mortality rate was also compared and we observed that mortality was present in 58 cases in the presence and absence of hyponatremia in the low MELD score; with hyponatremia 23 low MELD score cases (39.65%); whereas, 13 cases of without hyponatremia (19.70%) with low MELD score (P-value = 0.01). Detailed outcomes analysis of low MELD frequency and mortality comparison in low MELD patients have been carried out in the given tabular data and graphs.

Table – I: Frequency of Low MELD Score with And Without Hyponatremia (250)

Low MELD score		Number	Percentage
Yes	With hyponatremia	58	23.2
	Without hyponatremia	66	26.4
No	With & without hyponatremia	126	50.4
Total		250	100

**Table – II:** Comparison of Mortality in Low Meld Score with and Without Hyponatremia

Mortality	Low MELD score with hyponatremia (58)		Low MELD score without hyponatremia (66)	
	Number	Percentage	Number	Percentage
Yes	23	39.65	13	19.7
No	35	60.35	53	80.3
Total	58	100	66	100



DISCUSSION:

We aimed to determine the hyponatremia and low MELD score frequency in the bracket of (11 – 20) in decompensated liver cirrhosis patients. We also compared the mortality frequency in the chronic liver disease patients who presented MELD score (11 – 20) in the presence or absence of hyponatremia. Our research included 250 patients with mean age of (44.97 ± 9.06) years. We included 129 males (51.6%) and 121 females (48.4%). Research had a dominance of males over females. Low MELD score frequency in the absence and presence of hyponatremia was reported in the outcomes of this research as 58 with hyponatremia cases (23.2%); whereas, 66 cases were without hyponatremia (26.4%). We also observed that 126 cases (50.4%) had no low MELD score. Mortality rate was also compared and we observed that mortality was present in 58 cases in the presence and absence of hyponatremia in the low MELD score; with hyponatremia 23 low MELD score cases (39.65%); whereas, 13 cases of without hyponatremia (19.70%) with low MELD score (P-value = 0.01).

Deitelz Weig reported readmission of patients of cirrhosis within the timespan of thirty days after being once discharged (25.1% Versus 11.0%) and a significant P-value of (< 0.001) [6]. Hauman reported about hyponatremia that it is a good marker of an early mortality in patients, who have low MELD score (under 20); a mortality rate of 33.5% with low value of Na serum was also compared with normal Na serum of 5.8% at an interval of 180 days of

treatment [2]. Predictive accuracy can be improved with the combination of MELD score and serum sodium (Na) values specifically in those patients who have been reported a low MELD score. It is also a fact that is reported in various studies; if MELD score increases than a prediction of mortality are less disturbed with the level of sodium (Na) serum [7]. Our outcomes are also comparable with the abovementioned research studies.

There is also an association of hyponatremia with an impaired renal function which is induced through hemodynamic disorders which also develop an advanced cirrhotic stage. Hyponatremia is also linked with hepatorenal syndrome and refractory ascites which also increases the mortality and complications [8 – 11]. OLT setting has confirmed the prognostic ability of hyponatremia. Various authors have also agreed with the mortality prediction strength of hyponatremia [12 – 15]. Remarkably, waitlist mortality risk increased about twelve percent for every unit value of concentration of serum (Na) sodium decrease in the limit of 120 mmol/L & 135 mmol/L [16]. On the basis of these outcomes, numerous tries have been made to combine MELD and Sodium (Na).

CONCLUSION:

It is concluded that decompensated liver cirrhosis patient's mortality rate with hyponatremia and MELD score (11 – 20) was more than the patients without hyponatremia; however, for an optimum

disease management, these patients were referred such as in at an early stage of a liver transplant.

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