

Validation of the mNUTRIC Score in Patients with Cirrhosis

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Introduction

Malnutrition in the critically ill is associated with poor wound healing, increased infections, costs and all-cause mortality. The recently developed nutrition risk in the critically ill (NUTRIC) and modified (mNUTRIC) scores were designed to identify patients in the intensive care unit (ICU) at high nutrition risk who would benefit from early and aggressive nutrition. To date there are no validated measures to assess the nutrition risk among patients with liver cirrhosis in the MICU.

Objective

Validate the mNUTRIC score in cirrhotic patients admitted to the ICU by evaluating the predictive power of the mNUTRIC score for 28-day and 6-month mortality.

Methods

A retrospective chart review was conducted on

- all patients with liver cirrhosis
- admitted to the MICU from 10/1/2017 - 9/30/2018
- at a tertiary liver transplant center.

Patients were excluded if they were

- <18 years old
- had acute liver failure without previously documented cirrhosis
- transferred from an outside hospital ICU
- previously admitted to an ICU within the 30 days prior to the current admission.

ICU admissions of <24 hours were also excluded.

	28-day outcomes		
	Alive (n = 20)	Deceased (n = 28)	p-value
Age, years, median (IQR)	57 (33 - 74)	58 (31 - 69)	0.213
Female, n (%)	7 (35)	6 (27)	0.339
Race, n (%)			0.926
Caucasian	7 (35)	12 (43)	
Black	4 (20)	4 (14)	
Hispanic	8 (40)	11 (39)	
Asian	1 (5)	1 (4)	
BMI, kg/m ² , median (IQR)	27.1 (17.9 - 37.3)	30.5 (18.5 - 50.2)	0.048
Hospital LOS prior to ICU admission, days, median (IQR)	2 (0 - 25)	3 (0 - 18)	0.364
ICU LOS, days, median (IQR)	5 (2 - 13)	5.5 (2 - 45)	0.473
Mechanical ventilation, days, median (IQR)	1.5 (2 - 13)	3 (0 - 44)	0.003
Vasopressors, days, median (IQR)	0.5 (0 - 3)	2 (0 - 27)	0.011
RRT initiation, n (%)	5 (25)	14 (50)	0.134
APACHE II score, median (IQR)	22.5 (14 - 30)	27 (10 - 39)	0.003
SOFA score, median (IQR)	10 (6 - 15)	13 (6 - 20)	0.011
mNUTRIC score, median (IQR)	6 (3 - 8)	7 (4 - 8)	0.035
Low Risk (0-4), n (%)	5 (25)	3 (11)	
High Risk (5-9), n (%)	15 (75)	25 (89)	
Comorbidities, median (IQR)	3 (1 - 7)	3 (1 - 5)	0.705
MELD score, median (IQR)	28 (13 - 40)	37 (16 - 49)	0.009
MELD Na score, median (IQR)	28 (13 - 51)	37 (17 - 49)	0.011
ICU admission diagnosis, n (%)			0.577
Respiratory	4 (20)	7 (25)	
Cardiac	1 (5)	2 (7)	
GI	5 (25)	8 (29)	
Metabolic/Electrolyte	1 (5)	4 (14)	
Neuro	5 (25)	2 (7)	
Sepsis	4 (20)	5 (18)	

Results

- 48 patients met inclusion criteria.
- 28-day mortality was 58.3%.
- 6-month mortality (n = 42) was 71.4%.
- Mean mNUTRIC score for the entire sample was 6.1 ± 1.4.
- In univariate analyses, BMI, days on mechanical ventilation (MV), days on vasopressors (VP), MELD, MELD Na, APACHE II, SOFA and mNUTRIC scores were all significantly associated with 28-day mortality.
 - There was no significant difference between high and low risk mNUTRIC scores in relation to 28-day mortality ($p = 0.19$), nor was there an association between mNUTRIC score and 6-month mortality ($p = 0.46$).
- Logistic regression tested the association of MELD Na score, duration of MV and VP, and mNUTRIC with 28-day mortality.
 - BMI not included (unreliable in the presence of ascites).
 - APACHE II and SOFA scores not included (components of the mNUTRIC score).
 - The model was significantly associated with 28-day mortality, but the addition of mNUTRIC did not improve the predictive power (R^2 change = 0.040, $p = 0.093$).
- A Receiver Operating Characteristic (ROC) curve found that mNUTRIC significantly predicts 28-day mortality ($p = 0.037$) with an area under the curve of 0.68

Conclusion

mNUTRIC was significantly associated with 28-day mortality; however, the addition of this scoring system did not help to differentiate patients with cirrhosis at higher mortality risk.