

MELD score dynamics in patients awaiting liver transplantation and waitlist outcomes

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INTRODUCTION

Recent advances in hepatology therapeutics hold promises that the prognosis of patients with decompensated cirrhosis (DC) can be fundamentally altered. The model for end stage liver disease (MELD) has been shown to predict survival of patients with DC.

AIM

To correlate changes in MELD score with subsequent transplant-free survival in patients with decompensated cirrhosis awaiting liver transplantation (LT).

METHODS

- Data used in this analysis is Standard Transplant Analysis and Research (STAR) file as of December 2014 obtained from Organ Procurement and Transplantation Network (OPTN) administered by United Network for Organ Sharing (UNOS).
- OPTN manages the US national transplant waiting list and allocates donated organs for transplantation and maintains the data generated in the process.
- Primary study population consisted of adult liver transplant candidates waiting for liver transplantation on or after 1 Jan 2010.
- Excluded if they had a previous transplant, if listed for multi-organ transplant, if listed as status 1a patient, or those receiving exception points.
- Patients were stratified into 4 groups based on the liver disease diagnosis at listing including hepatitis C (HCV), non-alcoholic steatohepatitis (NASH), alcoholic liver disease (ALD), and cryptogenic cirrhosis.
- The effect of change in MELD score over 12 weeks on subsequent 2 year transplant-free survival (death and LT were considered as events while withdrawal from the waiting list for other reasons was censored) was assessed by multivariable proportional hazards regression analysis.

RESULTS

- Eligible waitlist registrants were 35,114 including 22,368 men and 12,746 women.
- Majority (41%, n=14,431) of patients had MELD <15, 9,981 had MELD between 15 and 20, and 10,702 with MELD of 21 or higher.
- HCV was the most common diagnosis (33.6%, n= 11,804) followed by ALD (20%, n=7,013), NASH (12.1%, n=4,258) and cryptogenic (5.8%, n=2,045).
- Patients whose MELD decreased by 2 or more points over 12 weeks had significantly lower risk of transplant or death when compared to patients with stable MELD in patients with HCV and NASH
 - Incidence rate ratios of 0.6 among HCV and NASH (both p<0.02), 0.75 for ALD (p=0.16), and 0.62 for cryptogenic cirrhosis (p=0.12)
- Patients whose MELD decreased by 2 or more points had significantly lower risk of transplant or death when compared to patients with an increase in MELD by 2-5 points, with similar findings across different cirrhosis etiologies:
 - Incidence rate ratios of 0.4 among HCV and NASH (both p<0.01), 0.35 for ALD (p<0.01), and 0.45 for cryptogenic cirrhosis (p<0.02)

Table 1: Incidence rates of death or transplants per 100 people per year (95% Confidence Intervals) in patients with an initial MELD of 10-14 and experienced a change in MELD score over 12 weeks - stratified by etiology

Patients with initial MELD 10-14 Change in MELD score	Diagnosis			
	HCV	NASH	ALD	Cryptogenic
Decrease by ≥ 2	16 (13 - 21)	18 (12 - 27)	11 (8 - 16)	17 (10 - 29)
No change (±1)	27 (25 - 30)	30 (26 - 36)	15 (12 - 18)	27 (21 - 35)
Increase by 2-5	44 (39 - 50)	48 (40 - 58)	32 (26 - 39)	38 (28 - 52)
Increase by 6-10	97 (78 - 121)	162 (118 - 224)	61 (43 - 86)	43 (22 - 87)
Increase by 11+	239 (174 - 328)	347 (213 - 567)	291 (165 - 513)	714 (268 - 1903)

Table 2: Death or liver transplant incidence rate ratios (95% Confidence Intervals) comparing patients whose MELD decreased by 2 or more point to those with stable, increased MELD - stratified by etiology

MELD score decrease by ≥ 2 Vs.	Diagnosis			
	HCV	NASH	ALD	Cryptogenic
No change (±1)	0.60 (0.47 - 0.77)	0.60 (0.39 - 0.91)	0.75 (0.50 - 1.12)	0.62 (0.34 - 1.13)
Increase by 2-5	0.37 (0.28 - 0.48)	0.38 (0.25 - 0.58)	0.35 (0.23 - 0.52)	0.45 (0.24 - 0.83)
Increase by 6-10	0.17 (0.12 - 0.23)	0.11 (0.07 - 0.19)	0.18 (0.11 - 0.30)	0.39 (0.16 - 0.95)
Increase by 11+	0.07 (0.05 - 0.10)	0.05 (0.03 - 0.10)	0.04 (0.02 - 0.08)	0.02 (0.01 - 0.07)

SUMMARY

Among the patients whose initial MELD was 10-14:

- Those who experienced a decrease by 2 or more points over 12 weeks had lower incidence of death or liver transplantation compared to patients whose MELD had no change.
- Whereas those with a rising MELD score had progressively higher incidence according to the degree of increase.
- Results are similar across different cirrhosis etiologies.

CONCLUSIONS

Dynamic assessment of MELD score provides additional prognostic information.

Patients whose MELD decreases over 12 weeks have a lower risk of death or liver transplantation over 2 year time frame compared to those whose MELD remains stable or increases.

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