Role of Model of End-Stage Liver Disease eXcluding INR (MELD-XI) for prediction of long-term outcome in orthotopic heart transplantation

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Background: The MELD score, incorporating liver and renal function results, is a simple tool offering a multimodality approach, which can help predict adverse outcomes in patients after orthotopic heart transplantation (OHT). Given the higher rate of anticoagulation in OHT, MELD-XI excluding INR provides an additional benefit eliminating the confounding influence of the anticoagulants.

Aim: To elucidate the role of MELD-XI as a prognostic marker in long-term follow-up after OHT.

Methods: Retrospective analysis of the data collected at last follow-up. Additionally, MELD-XI was calculated using the formula:

MELD-XI = 11.76 x ($\log_e$ serum creatinine in mg/dl) + 5.11 x ($\log_e$ total bilirubin in mg/dl) + 9.44.

Results: The study population consisted of 185 patients with a mean follow-up of 14.9 ± 6.9 years and a mean age at the time of OHT of 44.8 ± 15.5 years. The mean MELD-XI score was calculated to be 16.7 ± 6.0. The study population was stratified into relatively equal groups – group 1 with MELD-XI < 16, n = 93, 50.3 % and group 2 with MELD-XI ≥ 16, n = 92, 49.7 % (Table 1). Patients from group 2 were older at the time of OHT, had slightly reduced left ventricular ejection fraction (LVEF), more impaired renal function, non-significant difference in serum bilirubin values, but presented with significantly higher levels of cholestatic parameters such as alkaline phosphatase (AP) and gamma-glutamyl transferase (GGT) as well as reduced level of pseudocholinesterase (PChE). When adjusted for age prior to OHT, MELD score ≥ 16 was identified as a mortality-relevant factor in a multivariate logistic regression analysis (HR 1.83, 95% CI 1.01 – 3.30, p = 0.046).

Conclusions: Taken altogether, our study provides evidence that MELD-XI can be a reliable tool when assessing the prognostic relevance of impaired hepato-renal function in OHT.

Table 1.

Parameters	MELD-XI < 16	MELD-XI ≥ 16	p value
Age at OHT, years	41.5 ± 15.5	48.2 ± 14.8	0.003*
LVEF, %	57.2 ± 6.5	54.7 ± 9.8	0.041*
Bilirubin, mg/dL	0.6 ± 0.3	0.6 ± 0.4	0.301
AP, U/L	87.1 ± 25.9	119.6 ± 75.6	< 0.001*
GGT, U/L	43.6 ± 41.5	102.8 ± 164.7	0.001*
PChE, U/L	7773.1 ± 1918.0	6550.3 ± 1892.1	< 0.001*
GFR, ml/min/m²	62.1 ± 18.0	24.8 ± 17.8	< 0.001*
Blood urea, mg/dL	22.6 ± 9.1	46.2 ± 21.2	< 0.001*
Creatinine, mg/dL	1.2 ± 0.3	3.5 ± 1.8	< 0.001*