HEART FAILURE AND TRANSPLANTATION
Journal Watch
November
2015

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REVIEWS:

MELD-XI Score Predicts Early Mortality in Patients After Heart Transplantation.
Grimm JC, Shah AS, Magruder JT, Kilic A, Valero V 3rd, Dungan SP, et al.
The Annals of Thoracic Surgery, Volume 100, Issue 5, 1737 – 174.

In this retrospective analysis of the UNOS database, the authors evaluate the utility of using the MELD excluding INR (MELD XI) score in predicting outcomes after heart transplantation.

Using the UNOS database, all adult patients undergoing heart transplantation from 2000-2012 were included in the analysis. Dual organ transplant patients were excluded from the analysis. MELD XI score was calculated using data at the time of transplant as follows: MELD-XI = 5.11 × ln (serum bilirubin) + 11.76 × ln (serum creatinine) + 9.44.

In total, 22,597 patients were included in the analyses. The median MELD-XI score population was 12.7. The following score cohorts were created: low (≤10.5), low-intermediate (10.6 to 12.6), intermediate-high (12.7 to 16.4), and high (>16.4).

The high MELD-XI cohort experienced statistically worse 30-day survival (92.8% vs 97.0%, $p < 0.001$), 1-year survival (83.3% vs 91.7%, $p < 0.001$), and 5-year survival (70.0% vs 78.2%, $p < 0.001$) when compared with the low score cohort. However, there was no difference in 5-year survival—conditional on 1-year survival, between patients with high and low MELD-XI scores (83.0% versus 81.0%, $p = 0.11$). In multivariable Cox proportional hazards modeling, a high MELD-XI score was an independent predictor of post-OHT mortality

In a sub analysis of the 11.8% patients in the study group who were supported by continuous flow LVAD prior to transplantation, there was a significant difference in 30-day survival (92.0% vs 97.5%, $p < 0.001$), 1-year survival (81.3% vs 92.7%, $p < 0.001$), and 5-year survival (64.3% vs 77.8%, $p < 0.001$) between the high and low MELD-XI cohorts

It was also noted that there was a strong association with requirement of postoperative hemodialysis in patients with higher MELD XI scores. The high score cohort had the greatest incidence (11.8%) when compared with the other three groups (low 4.7%, low-intermediate 6.3%, intermediate-high 9.1%; $p < 0.001$). In each MELD-XI cohort, 30-day and 1-year survivals were significantly reduced in patients who had postoperative renal failure ($p < 0.001$).

The main study limitations are that it is a retrospective review of a transplant registry database. The timing of laboratory values to the time of transplant is unknown. Also, the duration of mechanical circulatory support were unknown, therefore the effect of mechanical circulatory support on right ventricular function is unknown.

Therefore, it is unclear whether the MELD XI components represent improvement or decline in the hepatic and renal function. Other confounders in post-transplant outcomes such as institutional volume are unaccounted for in this study.

This study is the first known study to evaluate the ability of the MELD XI score to predict outcomes after OHT. Patients with high MELD-XI scores experienced significantly worse 30-day and 1-year survival and were at risk for requiring post-OHT dialysis. It is crucial to identify patients at high risk for morbidity and mortality after heart transplantation.

Post-transplant lymphoproliferative disease in heart and lung transplantation: Defining risk and prognostic factors.
Kumarasinghe G, Lavee O, Parker A, Nivison-Smith I, Milliken S , Dodds A, et al.
J Heart Lung Transplant. 2015 Nov;34(11): p1406–1414.

In this retrospective analysis from Australia, 70 cases of PTLD were identified (41 heart, 22 lung, 6 heart–lung and 1 heart–kidney transplant) from 1984 to 2013.

The incidence of PTLD was higheest in the heart–lung group (7.6%), followed by heart (5.4%) and lung transplant recipients (3.1%). Extranodal disease (82%) with diffuse large B-cell lymphoma (72%) was the most common presentation. Bone marrow involvement (13%) and central nervous system disease (3%) were uncommon.

Heart transplant recipients had later onset of PTLD (>1 year post-transplant), with less allograft involvement, compared with lung and heart–lung recipients.

Poor prognostic markers were bone marrow involvement (HR 6.75, $p < 0.001$) and serum albumin <30 g/liter (HR 3.18, $p = 0.006$). Improved survival was seen with a complete response within 3 months of treatment (HR 0.08, $p < 0.001$). Five-year overall survival was 29%.

Limitations included the retrospective design, single center, several years of analysis that included changes in treatment, and the development of sophisticated laboratory EBV diagnostic techniques and positron emission tomography scanning for lymphoma. Despite these limitations, this analysis is one of the largest describing PTLD in heart and lung transplant recipients.

ADDITIONAL ARTICLES OF INTEREST:

Circulation Heart Failure

1. Pasqualucci, D. et al. *Clinical Spectrum, Therapeutic Options, and Outcome of Advanced Heart Failure in Hypertrophic Cardiomyopathy*. Circ Heart Fail. 2015 Nov;8(6):1014-21.

2. Finocchiaro G, Haddad F, Knowles JW, Caleshu C, Pavlovic A, Homburger J, Shmargad Y, Sinagra G, Magavern E, Wong M, Perez M, Schnittger I, Myers J, Froelicher V, Ashley EA. *Cardiopulmonary Exercise Testing and Prognosis in Hypertrophic Cardiomyopathy*. Circulation: Heart Failure.2015; 8: 1022-1031

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3. Stuart M. Zeltzer, David O. Taylor, W.H. Wilson Tang. *Long-term dietary habits and interventions in solid-organ transplantation.* J Heart Lung Transplant. 2015 Nov;34(11): p1357–1365.

4. Neha Singh, Ward Heggermont, Steffen Fieuws, Johan Vanhaecke, Johan Van Cleemput, Bart De Geest. *Endothelium-enriched microRNAs as diagnostic biomarkers for cardiac allograft vasculopathy*. J Heart Lung Transplant. 2015 Nov;34(11): p1376–1384.

5. Oluwayemisi L. Adejumo, Todd M. Koelling, Scott L. Hummel. *Nutritional Risk Index predicts mortality in hospitalized advanced heart failure patients.* J Heart Lung Transplant. 2015 Nov;34(11): p1385–1389.

6. Joshua C. Grimm, Arman Kilic, Ashish S. Shah, J. Trent Magruder, Vicente Valero III, Samuel P. Dungan, Stuart D. Russell, Ryan J. Tedford, Glenn J.R. Whitman, Christopher M. Sciortino. *The influence of institutional volume on the incidence of complications and their effect on mortality after heart transplantation.* J Heart Lung Transplant. 2015 Nov;34(11): p1390–1397.

7. James P. Bosanquet, Chad A. Witt, Bradford C. Bemiss, Derek E. Byers, Roger D. Yusen, Alexander G. Patterson, Daniel Kreisel, Thalachallour Mohanakumar, Elbert P. Trulock, Ramsey R. Hachem. *The impact of pre-transplant allosensitization on outcomes after lung transplantation.* J Heart Lung Transplant. 2015 Nov;34(11): p1415–1422.

8. Purificación Pérez-Terán, Oriol Roca, José Rodríguez-Palomares, Judit Sacanell, Sandra Leal, Joan Solé, María I. Rochera, Antonio Román, Juan C. Ruiz-Rodríguez, Joaquim Gea, Arturo Evangelista, Joan R. Masclans. *Influence of right ventricular function on the development of primary graft dysfunction after lung transplantation.* J Heart Lung Transplant. 2015 Nov;34(11): p1423–1429.

9. Chul-Ho Kim, Lyle J. Olson, Win K. Shen, Yong-Mei Cha, Bruce D. Johnson. *Ventilatory gas exchange and early response to cardiac resynchronization therapy.* J Heart Lung Transplant. 2015 Nov;34(11): p1430–1435.

10. Andrew T. Braun, Elliott C. Dasenbrook, Ashish S. Shah, Jonathan B. Orens, Christian A. Merlo. *Impact of lung allocation score on survival in cystic fibrosis lung transplant recipients.* J Heart Lung Transplant. 2015 Nov;34(11): p1436–1441.

11. Harry M. Gallagher, Ghulam Sarwar, Tracy Tse, Timothy M. Sladden, Esmond Hii, Stephanie T. Yerkovich, Peter M. Hopkins, Daniel C. Chambers. *Erratic tacrolimus exposure, assessed using the*

standard deviation of trough blood levels, predicts chronic lung allograft dysfunction and survival. J Heart Lung Transplant. 2015 Nov;34(11): p1442–1448

12. Joshua C. Grimm, Vicente Valero III, J. Trent Magruder, Arman Kilic, Samuel P. Dungan, Leann L. Silhan, Pali D. Shah, Bo S. Kim, Christian A. Merlo, Christopher M. Sciortino, Ashish S. Shah. *A novel risk score that incorporates recipient and donor variables to predict 1-year mortality in the current era of lung transplantation.* J Heart Lung Transplant. 2015 Nov;34(11): p1449–1454.

13. Rainer Gloeckl, Inga Heinzelmann, Stella Seeberg, Thomas Damisch, Wolfgang Hitzl, Klaus Kenn. *Effects of complementary whole-body vibration training in patients after lung transplantation: A randomized, controlled trial.* J Heart Lung Transplant. 2015 Nov;34(11): p1455–1461.

14. Ryan R. Davies, Shylah Haldeman, Michael A. McCulloch, Samuel S. Gidding, Christian Pizarro. *Low body mass index is associated with increased waitlist mortality among children listed for heart transplant.* J Heart Lung Transplant. 2015 Nov;34(11): p1462–1470.

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15. Bahaaldin Alsoufi, Shriprasad Deshpande,Courtney McCracken, Brian Kogon, Robert Vincent, William Mahle, and Kirk Kanter. *Results of heart transplantation following failed staged palliation of hypoplastic left heart syndrome and related single ventricle anomalies.* Eur J Cardiothorac Surg (2015) 48 (5): 792-799.

Transplantation

16. Knoll GA, Tinckam KJ. *Organ Donation and Transplantation: The View From Canada. Transplantation.* 2015;99(11):2231-2233.

17. Krenzien F, ElKhal A, Quante M, et al. *A Rationale for Age-Adapted Immunosuppression in Organ Transplantation. Transplantation.* 2015;99(11):2258-2268.

18. Neujahr DC. *Lung Microvessicles May Hold Clues to Lung Transplant Failure.* Transplantation. 2015;99(11):2243-2244.

19. Yamamoto S, Yamane M, Yoshida O, et al. Early Growth Response-1 Plays an Important Role in *Ischemia-Reperfusion Injury in Lung Transplants by Regulating Polymorphonuclear Neutrophil Infiltration.* Transplantation. 2015;99(11):2285-2293.

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21. Harms A, Fuehner T, Warnecke G, Haverich A, Gottlieb J, Trummer A. *Epithelial and Erythrocyte Microvesicles From Bronchoalveolar Lavage Fluid Are Elevated and Associated With Outcome in Chronic Lung Allograft Dysfunction.* Transplantation. 2015;99(11):2394-2400.

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23. Vo AA, Choi J, Kim I, et al. *A Phase I/II Trial of the Interleukin-6 Receptor–Specific Humanized Monoclonal (Tocilizumab) + Intravenous Immunoglobulin in Difficult to Desensitize Patients.* Transplantation. 2015;99(11):2356-2363