CONSTRUCTING AN INTENT-TO-TREAT INDEX TO PREDICT SURVIVAL OUTCOMES IN PEDIATRIC LIVER TRANSPLANT RECIPIENTS

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Background: Waitlist and post-transplant outcomes have been widely reported for pediatric liver transplantation. Yet analyzing these metrics individually fails to provide a holistic perspective for patients and their families. Intent-to-treat (ITT) analysis fills this gap by studying the associations between disease progression on the waitlist, organ availability, and post-transplant outcomes. Our study aims to identify significant waitlist factors and construct a predictive index utilizing ITT analysis for pediatric liver transplant recipients.

Materials/Methods: We performed a retrospective analysis utilizing de-identified data provided by the United Network for Organ Sharing (UNOS) from January 1st, 2000 to December 31, 2020. We analyzed data for 9,118 recipients, all under age <18. We conducted a univariate and multivariate logistic regression to find the significant predictive factors affecting the intent-to-treat analysis. A scoring index was constructed in order to stratify outcome risk based on the significant factors identified by regression analysis.

Results: Multivariate analysis found the following factors to be independently associated with death on the waitlist or after transplant: diagnoses: biliary atresia, hepatoblastoma, metabolic disorder; liver status: 1; life support; projected payment method: Medicaid; blood type O; ICU; ascites; diabetes mellitus; history of previous transplant; initial MELD/PELD score >41; initial age: 10-15; and initial age: 15-18. Using receiver operator curve (ROC) analysis, the proposed intent-to-treat index had a c-statistic of 0.70.

Conclusions: The intent-to-treat score index provides an additional prognostic model with predictive power to assess outcomes associated with pediatric liver transplantation. This ITT index could provide an additional perspective when discussing organ allocation as it is more representative of the patient’s perspective rather than analyzing individual metrics alone. Further analysis should be conducted to increase the predictive power of the index.

Images / Graph / Table
Figure 1. ROC Curve for the Intent-to-Treat Pediatric Liver Index