

ESTABLISHING A RISK SCORE TO PREDICT VENTILATOR DEPENDENCE AFTER PEDIATRIC LIVER TRANSPLANTATION.

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Background: Children with end stage liver disease and multi system organ failure may require prolonged mechanical ventilation (PMV) after liver transplantation (LT), which is associated with higher morbidity and mortality. The aim of this study was to identify preoperative risk factors, develop and validate risk score to predict PMV after pediatric LT.

Materials/Methods: A retrospective cohort analysis was conducted in children (< 18 years) who received LT between 2014-2019 at a quaternary children's hospital with a dedicated liver intensive care unit. PMV was defined as ventilation >7days post-LT. Independent risk factors were identified using multivariable logistic regression and the regression coefficients were applied to assign risk scores. The scores were adjusted by proportion to the beta coefficient in the regression model. The receiver operating characteristic (ROC) curves were generated to calculate area under the curve in the derivation group and to evaluate the performance of risk score on the validation group (LTs done in 2012-13, 2020-21). The results are described as Odds Ratio [95% Confidence Interval].

Results: Of the total 195 patients transplanted, 18% (n=37) had age< 1-year, 48% (n=95) had cirrhosis, 10% (n=20) required continuous renal replacement therapy (CRRT) and 31% (n=62) required medical management in hospital (MIH) before LT. Incidence of PMV was 26% (n=51), and 7% (n=14) required tracheostomy post-LT. On multivariable logistic regression analysis, cirrhosis (3.3 [1.2-8.9], p=0.01), age < 1- year (5.8 [2-16.3], p=0.0008), preoperative CRRT (5.8 [1.5-22.6], p=0.01) and MIH before LT (9.3 [3.4-25.6], p< 0.0001) were associated with the need for PMV. Cirrhosis was assigned a score of 1-point, preoperative CRRT and age < 1-year were each given score of 1.5-points and MIH before LT as 2-points to develop the scoring system (score range= 0-6). A score of >3.5-points had 100% sensitivity and 88% specificity to predict PMV. When the risk score was applied, area under the curve in the derivation group was 0.86 (p< 0.0001) and in the validation group (n=126) was 0.85 (p< 0.0001).

Conclusions: Independent risk factors for PMV after pediatric LT are cirrhosis, preoperative CRRT, age < 1 year and MIH before LT. The risk score can be applied to predict PMV after pediatric LT. Larger, multi-institutional prospective studies may be required to validate this score for the prediction of PMV.

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