Introduction

The Organ Procurement and Transplantation Network (OPTN) is moving toward a continuous distribution framework for lung allocation.

This framework includes measures of waitlist urgency and posttransplant survival, as calculated in the lung allocation score (LAS).

Currently, candidates aged 0-11 years are excluded from the LAS models and instead classified on the waitlist as Pediatric Priority I (more urgent) or II (less urgent).

These patients don’t have a measure of waitlist urgency or posttransplant survival to contribute to continuous allocation score.

Giving children a waitlist urgency and posttransplant survival measure in the continuous distribution framework allows children increased access to donor organs.

We computed these values in children to put children on the “same footing” in a continuous distribution framework in a data-driven way.

Methods (cont’d)

• Using SRTF data, we constructed a cohort of candidates 0-11 years on the lung waiting list September 12, 2010-January 31, 2019, the largest cohort available at the time of analysis.

• The Pediatric Priority score was introduced on September 12, 2010.

• Heart-lung candidates and candidates with no Pediatric Priority score were excluded.

• The model-fitting method was similar to LAS methods, except that we limited the models to one covariate: Pediatric Priority I vs. II.

• Waitlist candidates were followed for up to 1 year, starting at the earliest of January 31, 2010, waitlist removal, or the date when the candidate aged into the LAS system.

• Outcome was death on the waiting list within 1 year.

• Transplant recipients aged 0-11 years who underwent transplant September 12, 2010- January 31, 2019, were followed up to 1 year.

• The risk of waitlist death was 3.5 times higher for children classified as Pediatric Priority I, with 58.1% of candidates aged into the LAS system.

• Each model generated a baseline survival function and coefficient estimate associated with Pediatric Priority I.

• These were used to compute area under the curve (AUC) for the waitlist and posttransplant survival models.

• The value of waitlist AUC (WL-AUC) is interpreted as the predicted number of days a patient would survive on the waiting list.

• The value of the posttransplant AUC (PT-AUC) is interpreted as the number of predicted days a patient would survive in the first posttransplant year.

• For each cohort, we fit a Cox proportional hazards model and coefficient estimate associated with Pediatric Priority I.

• We computed WL-AUC and PT-AUC values computed for Pediatric Priority I and II.

• A Las equivalent for children that weights LAS values of 52.0 for Pediatric Priority I children and 37.3 for Pediatric Priority II children was 247 days, compared with 325 days for Pediatric Priority II children (Table 2).

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• Most children (54.2%) were aged 0-11 years when they entered the cohort, and 24.1% were infants. Recipient age distributions were similar.

• Diagnoses were varied, with nearly half of candidates and recipients classified as “other.”

• Nearly half of candidates were initially classified as Pediatric Priority I, and slightly over half had a final Pediatric Priority score of I.

• Among recipients, 55.0% were initially classified as Pediatric Priority I, with 58.1% Pediatric Priority I at transplant.

• The risk of waitlist death was 3.5 times higher among Pediatric Priority I children than in those in Pediatric Priority II (Figure 2). The cohort was small, and 95% confidence limits on the hazard ratio were wide: HR = 3.50 (1.80-6.79), P=0.0022.

Results

• The number of candidates and recipients was small, reflecting low volumes of children aged 0-11 years on the lung waiting list.

• The risk of waitlist death was 3.5 times higher among Pediatric Priority I children than in those in Pediatric Priority II (Figure 2). The cohort was small, and 95% confidence limits on the hazard ratio were wide: HR = 3.50 (1.80-6.79), P=0.0022.

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• Pediatric Priority I was not a significant predictor of 1-year posttransplant mortality: HR=0.88 (0.38-2.03), P=0.76.

• Estimates of WL-AUC for Pediatric Priority I children was 247 days, compared with 325 days for Pediatric Priority II children (Table 2).

• An LAS equivalent for children that weights WL-AUC twice as heavily as PT-AUC generated LAS values of 52.0 for Pediatric Priority I children and 37.3 for Pediatric Priority II children.

Summary & Conclusions

• Pediatric Priority I status was a significant predictor of 1-year waitlist mortality but not 1-year posttransplant mortality in children aged 0-11 years.

• WL-AUC and PT-AUC values computed for children provide a waitlist urgency and posttransplant outcome measure for children within the continuous distribution context, improving their access to lung donors.

• Additional access will be given to children via pediatric boost points and other factors in a continuous allocation score.