**Supplemental Table 1. Multivariable Predictors of Mortality in Children with Pulmonary Hypertension Requiring Extracorporeal Membrane Oxygenation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Characteristic** | **Crude** **OR** | **p-value** | **Adjusted OR** | **p-value** |
| Demographics |  |  |  |  |
|  Age1-6 months  | 1.6 (1.1-2.3) | 0.011\* | 1.5 (1.0-2.3) | 0.027\* |
| 6 months – 5 years | Reference |  | Reference |  |
| > 5 years | 2.2 (1.5-3.4) | <0.001\* | 2.1 (1.4-3.2) |  <0.001\* |
|  Gender, male | 0.9 (0.7-1.3) | 0.856 | 0.9 (0.6-1.2) | 0.412 |
|  Pulmonary hypertension type, secondary | 1.0 (0.7-1.3) | 0.983 | 1.2 (0.8-1.7) | 0.435 |
| Co-diagnoses |  |  |  |  |
| Heart failure | 0.9 (0.6-1.4) | 0.760 | 0.7 (0.5-1.2) | 0.222 |
| Congenital heart disease | 1.1 (0.8-1.5) | 0.564 | 1.2 (0.8-1.8) | 0.304 |
| Cardiogenic shock | 1.5 (0.8-2.8) | 0.214 | 1.6 (0.8-3.4) | 0.190 |
| Myocarditis or Cardiomyopathy | 0.6 (0.3-1.1) | 0.096 | 0.6 (0.3-1.4) | 0.241 |
| Arrhythmia  | 0.8 (0.4-1.7) | 0.618 | 0.8 (0.4-1.8) | 0.618 |
| Cardiac tamponade | 0.3 (0.1-1.6) | 0.156 | 0.2 (0.1-2.1) | 0.199 |
| Heart block or other conduction abnormality | 0.6 (0.2-1.8)  | 0.356 | 0.7 (0.2-2.6) | 0.644 |
| Respiratory failure | 1.0 (0.7-1.4) | 0.960 | 1.1 (0.7-1.6) | 0.714 |
| Pneumonia, Empyema or Lung Abscess | 0.5 (0.3-0.8) |  0.003\* | 0.6 (0.4-0.9) |  0.014\* |
| Bronchiolitis  | 0.5 (0.2-1.2) | 0.125 | 0.8 (0.3-2.0) | 0.691 |
| Pertussis | 2.4 (0.9-6.4) | 0.068 | 3.2 (1.0-10.4) | 0.056 |
| Influenza | 1.3 (0.4-3.7) | 0.660 | 0.6 (0.2-2.1) | 0.419 |
| Hemoptysis | 2.2 (0.6-8.8)  | 0.244 | 1.3 (0.3-6.0) | 0.714 |
| Sepsis or septic shock | 0.7 (0.3-1.3) | 0.23 | 0.7 (0.3-1.5) | 0.325 |
| Pre-ECMO Assessment |  |  |  |  |
|  Mechanical Supporta |  |  |  |  |
|  Cardiopulmonary bypass | 0.7 (0.5-1.2) | 0.190 | 0.6 (0.4-1.2) | 0.141 |
|  Ventricular assist device | 1.6 (0.6-4.7) | 0.366 | 1.7 (0.5-5.5) | 0.388 |
|  Pre-ECMO arrest | 1.5 (1.1-2.1) |  0.024\* | 1.2 (0.8-1.8) | 0.438 |
|  ECMO as bridge to transplant | 1.0 (0.5-2.2) | 0.940 | 0.5 (0.2-1.5) | 0.237 |
| Ventilator Settingsa |  |  |  |  |
| High-Flow Oscillatory vs. Conventional | 0.8 (0.5-1.2) | 0.285 | 1.0 (0.6-1.5) | 0.954 |
| Mean Airway Pressure > 25 | 1.2 (0.7-1.9) | 0.526 | 1.5 (0.9-2.5) | 0.158 |
|  Intubation duration pre-ECMO |  |  |  |  |
| 1 week to 1 month (vs. < 1 week) | 0.9 (0.5-1.3) | 0.474 | 1.2 (0.7-1.9) | 0.537 |
| > 1 month (vs. < 1 week) | 1.3 (0.7-2.6) | 0.399 | 1.3 (0.6-2.9) | 0.455 |
|  Pharmacologic therapiesa |  |  |  |  |
|  Sildenafil | 1.3 (0.7-2.2) | 0.417 | 1.3 (0.7-2.5) | 0.392 |
|  Nitric Oxide | 1.0 (0.7-1.4) | 0.895 | 1.2 (0.8-1.8) | 0.318 |
|  Prostacyclin analog | 1.5 (0.7-3.0) | 0.329 | 1.4 (0.6-3.4) | 0.470 |
|  Epinephrine | 1.1 (0.8-1.6) | 0.391 | 1.2 (0.7-1.8) | 0.541 |
|  Milrinone | 0.9 (0.6-1.2) | 0.425 | 1.0 (0.7-1.5) | 0.948 |
|  Dopamine  | 0.8 (0.6-1.2) | 0.233 | 0.8 (0.5-1.2) | 0.290 |
|  Norepinephrine | 0.8 (0.5-1.3) | 0.347 | 0.7 (0.4-1.3) | 0.127 |
|  Dobutamine | 0.6 (0.3-1.1) | 0.096 | 0.6 (0.3-1.4) | 0.233 |
|  Vasopressin | 2.9 (0.3-27.7) | 0.362 | 1.8 (0.1-21.8) | 0.646 |
|  >3 vasoactive infusions | 0.9 (0.7-1.3) | 0.602 | 0.9 (0.6-1.3) | 0.506 |
|  Paralytic | 0.9 (0.7-1.3) | 0.621 | 1.2 (0.8-1.8) | 0.293 |
|  Vasodilator therapy or nitroprusside | 1.6 (1.0-2.6) | 0.061 | 2.0 (1.1-3.7) |  0.019\* |
| Blood gas analysesb |  |  |  |  |
|  pH <7.12a | 1.8 (1.2-2.7) |  0.003\* | 1.3 (0.8-2.2) | 0.277 |
|  paCO2 > 75b  | 1.7 (1.1-2.5) |  0.010\* | 1.1 (0.7-1.8) | 0.716 |
|  paO2 < 35c | 1.7 (1.2-2.5) |  0.007\* | 1.0 (0.5-1.8) | 0.965 |
|  HCO3 < 19d | 1.2 (0.8-1.8) | 0.352 | 1.0 (0.6-1.6) | 0.999 |
|  SaO2 < 60%e | 1.9 (1.2-2.8) |  0.003\* | 1.7 (0.9-3.1) | 0.083 |
| ECMO Run |  |  |  |  |
|  Time Period, 2007-2013 vs. 2014-2018 | 1.1 (0.8-1.5) | 0.611 | 1.2 (0.8-1.7) | 0.297 |
|  Duration of ECMO run  |  |  |  |  |
| <24 hours | 1.8 (0.9-3.6) | 0.074 | 2.0 (1.0-4.3) | 0.061 |
| 24 hours – 280 hours | Reference |  | Reference |  |
| 280 hours | 1.5 (1.1-2.2) |  0.020\* | 1.2 (0.8-1.8) | 0.406 |
|  VV vs. VAf | 0.89 (0.6-1.3) | 0.587 | 1.0 (0.6-1.5) | 0.936 |
|  ECMO Support Type (vs. Pulmonary) |  |  |  |  |
| Cardiac | 1.0 (0.7-1.4) | 0.893 | 1.0 (0.7-1.4) | 0.856 |
| ECPR | 3.0 (1.8-4.8) | <0.001\* | 3.8 (2.2-6.3) | <0.001\* |
|  Centrifugal vs. Roller Pump  | 0.9 (0.6-1.2) | 0.458 | 0.8 (0.6-1.2) | 0.387 |
|  ECMO Complication |  |  |  |  |
|  Cardiovascular |  |  |  |  |
| Cardiac arrhythmia  | 1.4 (0.8-2.3) | 0.230 | 0.6 (0.3-1.1) | 0.122 |
| CPR | 2.7 (1.1-6.5) |  0.028\* | 1.4 (0.5-3.8) | 0.513 |
| Hypertension requiring vasodilators | 1.0 (0.7-1.4) | 0.874 | 0.6 (0.4-0.9) | 0.020\* |
| Inotropic support | 1.8 (1.3-2.4) | <0.001\* | 1.2 (0.8-1.7) | 0.400 |
| Myocardial stun | 8.8 (2.0-38.2) |  0.004\* | 6.5 (1.4-29.7) | 0.016\* |
| Tamponade | 1.2 (1.01-4.7) |  0.047\* | 1.9 (0.7-4.3) | 0.199 |
| Any cardiovascular | 1.7 (1.2-2.4) |  0.001\* | 1.2 (0.9-2.9) | 0.249 |
|  Pulmonary hemorrhage | 6.2 (3.0-12.8) | <0.001\* | 5.2 (2.5-11.2) | <0.001\* |
|  Neurologic |  |  |  |  |
| Intracranial hemorrhage | 3.8 (1.9-7.6) | <0.001\* | 3.3 (1.6-6.9) |  0.001\* |
| Intracranial infarction | 2.1 (0.9-4.6) | 0.078 | 0.9 (0.4-2.4) | 0.860 |
| Seizures | 3.2 (1.7-6.4) |  0.001\* | 2.2 (1.0-4.8) |  0.044\* |
| Any neurologic | 4.4 (2.8-7.1) | <0.001\* | 2.4 (1.5-4.1) |  0.001\* |
|  Hematologic |  |  |  |  |
| Other hemorrhage | 1.8 (1.3-2.6) | <0.001\* | 1.6 (1.1-2.2) |  0.016\* |
| DIC | 2.2 (1.01-4.7) |  0.047\* | 1.3 (0.5-3.1) | 0.631 |
| Hemolysis | 1.5 (0.9-2.6) | 0.078 | 1.1 (0.6-1.9) | 0.812 |
| Any hematologic | 2.1 (1.5-2.9) | <0.001\* | 1.3 (0.9-1.9) | 0.137 |
|  Renal replacement therapy  | 1.8 (1.3-2.5) | <0.001\* | 1.7 (1.1-2.5) |  0.008\* |
|  Mechanical/circuit complication | 1.3 (1.0-1.9) |  0.045\* | 1.3 (0.9-1.9) | 0.222 |
|  Infection (culture-proven) | 1.1 (0.8-1.8) | 0.455 | 0.8 (0.5-1.3) | 0.360 |
|  Metabolic acidosis (pH<7.2) | 3.6 (1.8-7.4) | <0.001\* | 2.6 (1.2-5.6) | 0.018\* |

Results displayed as odds ratio (95% confidence interval) with associated p-values. PH – pulmonary hypertension; ECMO – extracorporeal membrane oxygenation; OR – odds ratio; VV – veno-venous; VA – veno-arterial; ECPR - extracorporeal cardiopulmonary resuscitation; CPR – cardiopulmonary resuscitation; DIC – disseminated intravascular coagulation.

a Chosen because 7.12 is 25th percentile; n = 552

b Chosen because 75 is 75th percentile; n = 549

c Chosen because 35 is 25th percentile; n = 544

d Chosen because 19 is 25th percentile; n = 510

e Chosen because 60 is 25th percentile; n = 489

f Dichotomized based upon initial ECMO mode; n=6 other/unknown.

*\*Indicates p-value <0.05*