**Supplemental Table 3. Comparison of Patients on ECMO with Primary versus Secondary Pulmonary Hypertension**

|  |  |  |  |
| --- | --- | --- | --- |
| **Characteristic** | **Primary PHa**[n = 248] | **Secondary PH**[n = 386] | **p-value** |
| Mortality | 127 (51.2) | 198 (51.3) | 0.458 |
| Demographics |  |  |  |
|  Age (months) | 17.3, 5.0-141.3 | 9, 4.0-29.9 | <0.001\* |
|  Gender, male | 128 (52.7) | 192 (50.3) | 0.556 |
| Co-diagnoses |  |  |  |
| Heart failure | 33 (13.3) | 87 (22.5) | 0.004 |
| Congenital heart disease | 16 (6.5) | 281 (72.8) | <0.001\* |
| Cardiogenic shock | 12 (4.8) | 31 (8.0) | 0.119 |
| Myocarditis or Cardiomyopathy | 12 (4.8) | 25 (6.5) | 0.391 |
| Arrhythmia  | 6 (2.4) | 30 (7.8) | 0.004\* |
| Cardiac tamponade | 3 (1.2) | 5 (1.3) | 0.925 |
| Heart block or conduction abnormality | 3 (1.2) | 10 (2.6) | 0.231 |
| Respiratory failure | 65 (26.2) | 112 (29.0) | 0.442 |
| Pneumonia, Empyema or Lung Abscess | 47 (19.0) | 56 (14.5) | 0.139 |
| Bronchiolitis  | 14 (5.7) | 11 (2.9) | 0.078 |
| Pertussis | 9 (3.6) | 12 (3.1) | 0.721 |
| Influenza | 5 (2.0) | 9 (2.3) | 0.792 |
| Hemoptysis | 3 (1.2) | 7 (1.8) | 0.552 |
| Sepsis or septic shock | 12 (4.8) | 22 (5.7) | 0.639 |
| Pre-ECMO Assessment |  |  |  |
|  Mechanical Support |  |  |  |
|  Cardiopulmonary bypass | 13 (5.2) | 68 (17.6) | <0.001\* |
|  Ventricular assist device | 7 (2.8) | 9 (2.3) | 0.700 |
|  Pre-ECMO arrest | 74 (29.8) | 117 (30.3) | 0.899 |
| Ventilatory Support |  |  | <0.001\* |
| Conventional Ventilation | 106 (42.7) | 207 (54.6) |  |
| High-Flow Oscillatory Ventilation | 73 (29.4) | 62 (16.0) |  |
| Mean Airway Pressure | 20, 15-26 | 17, 13-24 |  0.003\* |
| Intubation duration pre-ECMO (hours) | 28, 7-134 | 33.5, 9-162 | 0.105 |
|  Pharmacologic therapies |  |  |  |
|  Sildenafil | 23 (9.3) | 30 (7.8) | 0.505 |
|  Nitric Oxide | 149 (60.1) | 222 (57.5) | 0.522 |
|  Prostacyclin analog | 17 (6.9) | 13 (3.4) |  0.044\* |
|  Epinephrine | 106 (42.7) | 219 (56.7) |  0.001\* |
|  Milrinone | 65 (26.2) | 155 (40.2) |  <0.001\* |
|  Dopamine  | 55 (22.2) | 104 (26.9) | 0.177 |
|  Norepinephrine | 39 (15.7) | 51 (13.2) | 0.376 |
|  Dobutamine | 19 (7.7) | 18 (4.7) | 0.116 |
|  Vasopressin | 2 (0.8) | 2 (0.5) | 0.655 |
| > 3 vasoactive infusions | 64 (25.8) | 139 (36.0) |  0.007\* |
|  Paralytic | 117 (47.2) | 209 (54.2) | 0.087 |
|  Vasodilator therapy or nitroprusside | 23 (9.3) | 50 (13.0) | 0.157 |
|  Blood gas analyses |  |  |  |
|  pH | 7.23, 7.11-7.34 | 7.24, 7.13-7.34 | 0.772 |
|  paCO2 | 55, 42-79 | 55, 43-75 | 0.935 |
|  paO2 | 48, 36-65 | 52, 35-85 | 0.150 |
|  HCO3 | 23.2, 19.9-27.6 | 24, 19-29.8 | 0.525 |
|  SaO2 (%) | 79, 60-89 | 83, 61-95 | 0.085 |
| ECMO Run |  |  |  |
|  Duration (hours) |  |  | 0.152 |
| <24 hours | 27 (10.9) | 50 (13.0) |  |
| 24 hours – 280 hours | 147 (59.3) | 247 (64.0) |  |
| 280 hours | 74 (29.8) | 89 (23.1) |  |
|  |  |  |  |
|  Mode |  |  | 0.384 |
| VA | 196 (79.0) | 314 (81.4) |  |
| VV | 35 (14.1) | 51 (13.2) |  |
| Conversion VV to VA | 14 (5.6) | 12 (3.1) |  |
| Conversion VA to VV | 2 (0.8) | 4 (1.0) |  |
|  Support Type |  |  |  <0.001\* |
| Cardiac | 64 (25.8) | 191 (49.5) |  |
| Pulmonary | 144 (58.1) | 129 (33.4) |  |
| ECPR | 40 (16.1) | 66 (17.1) |  |
|  Pump Type |  |  | 0.488 |
| Roller | 76 (35.0) | 114 (32.2) |  |
| Centrifugal | 141 (65.0) | 240 (67.8) |  |
|  ECMO as bridge to transplant | 16 (6.5) | 13 (3.4) |  0.048\* |
|  Discontinuation Reason |  |  | 0.319 |
| Expected Recovery | 162 (65.6) | 272 (70.7) |  |
| Died or Poor Prognosis | 72 (29.2) | 100 (26.0) |  |
| ECMO Complication | 13 (5.3) | 12 (3.1) |  |
| ECMO Complication |  |  |  |
|  Cardiovascular |  |  |  |
| Cardiac arrhythmia  | 15 (6.1) | 52 (13.5) |  0.003\* |
| CPR | 13 (5.2) | 13 (3.4) | 0.246 |
| Hypertension requiring vasodilators | 50 (20.2) | 96 (24.9) | 0.169 |
| Inotropic support required | 114 (46.0) | 195 (50.5) | 0.263 |
| Myocardial stun | 6 (2.4) | 15 (3.9) | 0.314 |
| Tamponade | 11 (4.4) | 21 (5.4) | 0.573 |
|  Pulmonary hemorrhage | 26 (10.5) | 34 (8.8) | 0.482 |
|  Neurologic |  |  |  |
| Brain death | 8 (3.2) | 12 (3.1) | 0.934 |
| Intracranial hemorrhage | 19 (7.7) | 32 (8.3) | 0.776 |
| Intracranial infarction | 14 (5.7) | 14 (3.6) | 0.227 |
| Seizures | 19 (7.7) | 31 (8.0) | 0.866 |
|  Hematologic |  |  |  |
| Other hemorrhage | 81 (32.7) | 163 (42.2) |  0.016\* |
| DIC | 12 (4.8) | 20 (5.2) | 0.847 |
| Hemolysis | 20 (8.1) | 52 (13.5) |  0.036\* |
|  Other |  |  |  |
| Renal replacement therapy | 89 (35.9) | 149 (38.6) | 0.491 |
|  Mechanical/circuit complication | 99 (39.9) | 152 (39.4) | 0.892 |
|  Infection (culture-proven) | 33 (13.3) | 60 (15.5) | 0.437 |
|  Metabolic acidosis (pH<7.2) | 17 (6.9) | 28 (7.3) | 0.849 |

Results displayed as median, IQR or n (%). ECMO – extracorporeal membrane oxygenation; PH – pulmonary hypertension; VV – veno-venous; VA – veno-arterial; ECPR - extracorporeal cardiopulmonary resuscitation; CPR – cardiopulmonary resuscitation; DIC – disseminated intravascular coagulation.

a 134 of the 382 cases with ICD9 or ICD10 codes for primary pulmonary hypertension were recoded as secondary pulmonary hypertension based on co-diagnoses of congenital heart disease (excluding isolated ASD, PDA, and VSD)

*\*Indicates p-value <0.05*