Appropriate ECMO Screening Protocols for Critically Ill Patients During COVID-19

Hudson Carter

Michael Baram, MD

Follow this and additional works at: https://jdc.jefferson.edu/si_ctr_2023_phase1

Part of the Critical Care Commons, and the Translational Medical Research Commons

Let us know how access to this document benefits you

This Article is brought to you for free and open access by the Jefferson Digital Commons. The Jefferson Digital Commons is a service of Thomas Jefferson University's Center for Teaching and Learning (CTL). The Commons is a showcase for Jefferson books and journals, peer-reviewed scholarly publications, unique historical collections from the University archives, and teaching tools. The Jefferson Digital Commons allows researchers and interested readers anywhere in the world to learn about and keep up to date with Jefferson scholarship. This article has been accepted for inclusion in Phase 1 by an authorized administrator of the Jefferson Digital Commons. For more information, please contact: JeffersonDigitalCommons@jefferson.edu.
Appropriate ECMO Screening Protocols for Critically-Ill Patients During COVID-19

Hudson Carter, Michael Baram MD*, Nawar Al-Rawas MD
What is ECMO?

• An intervention that provides intense cardiopulmonary support
• Advantages of use in COVID-19 patients
  – Direct pulmonary artery flow improves oxygenation and ventilation
  – Early mobility after removal
  – Minimal cannula-associated complications or revisions
  – Support of right side of heart in case of right ventricular dysfunction
ECMO Throughout the COVID-19 Pandemic

- Early data suggested a possible mortality rate >90%
- Currently 3,041 COVID-19 confirmed patients have been treated with ECMO
- Independent risk factors
  - Age, immunocompromised state, chronic respiratory disease, pre-ECMO cardiac arrest, degree of hypoxemia
- 3 categories for guidelines
  - Recommended: technique/intervention is beneficial
  - Not recommended: technique/intervention is not beneficial or harmful
  - Consider: possibly beneficial or use caution when utilizing
Objectives

- **Research Question**
  - Are the correct criteria being implemented for the screening of ECMO patients based on resources during COVID-19?

- **Hypothesis**
  - An increase in accepted COVID-19 ECMO referrals via changes to screening protocols allows for increased treatment and improved outcomes.

- **Objectives**
  - Evaluate screening criteria for ECMO patients during COVID-19
  - Determine if there is fair evaluation of the medically ill without bias
  - Potential liberalization of screening criteria
Approach

• Population: ECMO referrals between March-October 2020

• Outcomes
  – Accepted or decline referral
  – Patient disposition
  – Survival length

• Contacting the referring physician
  – Inquire about patient status before referral
  – Process of referring patients
  – Possible referral to another hospital if declined

• Analysis of accepted and declined patients within established window
  – Survival or death
  – Hospitalization duration and ECMO treatment duration
  – Reason for declination
Figure 1. Overall Patient Classification

- 64 total patient referrals between March 2020 and October 2020
Results

Table 1. Mortality of Classified Patients within 30 days

<table>
<thead>
<tr>
<th>Patient Classification</th>
<th>Alive &lt;30 days</th>
<th>Deceased &lt;30 days</th>
<th>Deceased &gt;30 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted</td>
<td>13</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Declined</td>
<td>10</td>
<td>23</td>
<td>0</td>
</tr>
</tbody>
</table>

- Further separation of patient population allows for identification of possible missed patients
- Severe organ dysfunction, underlying co-morbidities, and previous mechanical ventilation limited acceptable patients
Results

• 9 of the surviving patient group were discharged in fair-good disposition

• Majority of admitted patients were placed on VV-ECMO (63%)

• Mean age
  – Declined patients = 47
  – Accepted patients = 56

• Strongest predictors of mortality
  – Age, chronic respiratory disease, VA-ECMO use, ECMO duration, acute kidney injury
Conclusions

- ECMO is a useful intervention for increasing the survival rate of COVID-19 patients
  - Reserved for refractory cases of respiratory distress
- Current post-ECMO patient outcomes match the national average
- Expansion of criteria to allow earlier ECMO implementation can improve patient mortality
- Continued use of ECMO for accepted patients will decrease mortality of ARDS due to COVID-19
- A major limitation was the collection of information on declined patients
Future Directions

• Long-term outcomes of patients surviving ECMO support
  – Related to age, ECMO duration, initial disposition
• Racial disparities and equitable selection of ECMO patients
• Use of ECMO earlier in treatment course for patients with COVID-19
References


