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

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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
Results

Figure 1. Overall Patient Classification

- **Total Patient Referrals**
  - N = 64

  - **Accepted/Admitted**
    - N = 25
  - **Declined**
    - N = 33
  - **Other**
    - N = 6

- 64 total patient referrals between March 2020 and October 2020
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


