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We came, we saw, we cannulated?

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INTRODUCTION

In patients with refractory gas-exchange abnormalities, extracorporeal membrane oxygenation (ECMO) is considered rescue therapy that aims to decrease ventilator induced lung injury and provide lung rest.

AIM

To compare the cohort of patients who received ECMO as rescue therapy compared to other forms of rescue therapy at our institution.

METHODS

We conducted a retrospective study of patients diagnosed with ARDS (N=149) from October 2010 to September 2012 at Thomas Jefferson Hospital.

All patients mechanically ventilated with on the ARDS protocol were identified. Severity of illness and lung injury were determined based on APACHE II, PaO2 / FiO2 ratio, Oxygenation Index (OI) and Murray score.

Subjects who required additional therapy became the cohort known as rescue therapy. These patients required the use of inhaled Epoprostenol, neuromuscular blocking agents and /or Airway pressure release ventilation (APRV) to identified.

RESULTS

149 patients were identified, 62 patients received rescue therapy and 14 required ECMO.

Six of 14 patients received Veno-arterial ECMO and the remaining 8 received Veno-venous ECMO.

Patients with ARDS placed on ECMO had an absolute reduction in mortality of 27% when compared to patients who received other rescue modalities (77% vs. 50%; p = 0.32).

We believe that ECMO may be an important rescue modality in the right clinical setting in patients with severe ARDS.

Treat physicians should consider ECMO as a treatment modality for severe ARDS patients.

DISCUSSION

Patients with severe ARDS have a high mortality rate and often receive rescue therapy for gas exchange abnormalities.

There is growing appreciation that ECMO therapy is a valuable rescue therapy but there is controversy about selection of the right candidate.

There was a trend towards improved survival in the ECMO group.

These data provide support for using ECMO as rescue therapy in select populations. Hopefully future research will identify parameters to identify patients early who will benefit from ECMO therapy.

Our outcomes are similar to Cesar trial.

CONCLUSION

Initial patient characteristics in different treatment groups

<table>
<thead>
<tr>
<th>Parameters</th>
<th>No rescue therapy</th>
<th>Non ECMO rescue modality</th>
<th>ECMO rescue modality</th>
<th>CESAR Trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total patients</td>
<td>n=149</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>56 (18-88)</td>
<td>53 (22-91)</td>
<td>47 (17-77)</td>
<td>40</td>
</tr>
<tr>
<td>Etiology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumonia</td>
<td>49%</td>
<td>50%</td>
<td>50%</td>
<td>62%</td>
</tr>
<tr>
<td>Sepsis</td>
<td>34%</td>
<td>30%</td>
<td>21%</td>
<td></td>
</tr>
</tbody>
</table>

Initial Lung Mechanics

<table>
<thead>
<tr>
<th>Parameters</th>
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<th>ECMO rescue modality</th>
<th>CESAR Trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static compliance</td>
<td>30 (17-290)</td>
<td>26 (11-73)</td>
<td>24 (10-90)</td>
<td>28</td>
</tr>
<tr>
<td>MAP cmH2O</td>
<td>9 (5-24)</td>
<td>18.5 (15-30)</td>
<td>21 (20-70)</td>
<td></td>
</tr>
<tr>
<td>PEEP cmH2O</td>
<td>8 (5-14)</td>
<td>10 (5-24)</td>
<td>15 (5-24)</td>
<td>14</td>
</tr>
<tr>
<td>pH</td>
<td>7.40 (7.1-7.5)</td>
<td>7.34 (7.1-7.5)</td>
<td>7.30 (7.0-7.5)</td>
<td>7.10</td>
</tr>
<tr>
<td>pCO2 mmHg</td>
<td>41 (30-80)</td>
<td>40 (26-76)</td>
<td>45 (41-144)</td>
<td></td>
</tr>
<tr>
<td>pO2 mmHg</td>
<td>92 (81-194)</td>
<td>81 (48-383)</td>
<td>69 (25-118)</td>
<td></td>
</tr>
<tr>
<td>APACHE II Score</td>
<td>25 (7-42)</td>
<td>24 (10-44)</td>
<td>29 (11-10)</td>
<td>20</td>
</tr>
</tbody>
</table>

Mortality rate

<table>
<thead>
<tr>
<th>No rescue therapy</th>
<th>Non ECMO rescue modality</th>
<th>ECMO rescue modality</th>
<th>CESAR Trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>39%</td>
<td>77%</td>
<td>50%</td>
<td>37%</td>
</tr>
</tbody>
</table>

A-a gradient: alveolar arterial gradient; MAP: Mean airway pressure, Oxygenation Index = PaO2 x MAP / PaO2

Different rescue modalities used in Non ECMO rescue group

- Patients with severe ARDS have a high mortality rate and often receive rescue therapy for gas exchange abnormalities.
- There is growing appreciation that ECMO therapy is a valuable rescue therapy but there is controversy about selection of the right candidate.
- There was a trend towards improved survival in the ECMO group.
- Severe hypoxenia coupled with elevated PaCO2 and younger age appeared to be triggers for use of ECMO at our institution.
- These data provide support for using ECMO as rescue therapy in select populations. Hopefully future research will identify parameters to identify patients early who will benefit from ECMO therapy.
- Our outcomes are similar to CESAR trial.