INTRODUCTION

- Current prognostication strategies in cardiac arrest do not take full advantage of continuous measurement of neural networks’ function provided by EEG
- We developed a pipeline that utilizes machine-learning methods and quantitative EEG (QEEG) features to provide continuous estimation of neurological recovery potential

METHODS

- Retrospective
- Two academic centers in the U.S.
- Adult subjects
- First 48 hours of EEG recording from return of spontaneous circulation
- EEG: data streamed from Cz channel exclusively

QEEG features:
- Regularity
- Tsalis Entropy
- Alpha-to-Delta Ratio
- Subband Information Quantity (IQ)
- Voltage <10 uV

Poor outcome (at discharge):
- Cerebral Performance Category: 3-5

Statistical Analysis:
- Learning algorithm: 10-fold cross validation resampling method
- Model performance: Logistic regression
  - Area under ROC curve (AUC)
  - Sensitivity and Specificity

RESULTS

Table 1: Demographics

<table>
<thead>
<tr>
<th></th>
<th>CPC 1-2 N=37</th>
<th>CPC 3-5 N=106</th>
<th>Total N=143</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean; SD)</td>
<td>51.1 (19)</td>
<td>60.5 (18.5)</td>
<td>58.1 (19)</td>
</tr>
<tr>
<td>Female (%)</td>
<td>37.8%</td>
<td>40.6%</td>
<td>39.2%</td>
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<tr>
<td>VF/VT (%)</td>
<td>64.9%</td>
<td>31.7%</td>
<td>39.2%</td>
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Mortality: 61.5% * p<0.05

CONCLUSIONS

- Outcome prediction models in cardiac arrest that utilize QEEG should account for the dynamic changes of EEG patterns as a function of time
- Employment of machine-learning methods on QEEG analysis allows for early and robust outcome prediction in cardiac arrest

REFERENCES


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*These authors contributed equally to this work. Disclosures: none