CONVERSION TO SHOCKABLE RHYTHMS DURING RESUSCITATION AND SURVIVAL FOR OUT-OF-HOSPITAL CARDIAC ARREST

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Background & Importance

- Initial shockable rhythm (VF/VT/Unspecified shockable rhythm captured by EMS team)
  - *a significant predictor of survival outcomes after OHCA*

- Minority of OHCA - initial shockable rhythm

- Majority in Asia - initial non-shockable rhythm
  - *May revert to a shockable rhythm after a period of resuscitation*

- The prognostic influence of conversion to shockable rhythms during resuscitation for initially non-shockable rhythms – unclear, conflicting
Aim

- To assess the relationship between initial and subsequent shockable rhythm and post-arrest survival and neurological outcomes after OHCA
Methodology

- Study design and setting
  - Retrospective analysis of OHCA reported to PAROS registry (2009-2012)
  - 7 countries (Japan, Republic of Korea, Malaysia, Singapore, Taiwan, Thailand, UAE)

- Inclusion criteria
  - Adult OHCA (≥18 years) of presumed cardiac etiology, and had resuscitation attempted by EMS (2009-2012)
Methodology

- Data analysis
  - Outcomes = ROSC, Survival-to-admission, Survival-to-discharge, Favorable post-arrest overall and cerebral performance (1/2)
  - Univariate and multivariate logistic regression
  - 2-stage seemingly unrelated bivariate probit model
  - Adjusted for the clustering effects of country variance in all models
Total OHCA between 2009 and 2012
n=66,780

≥18 years, presumed cardiac etiology, resuscitation attempted by EMS/private ambulance n=40,160

Missing initial rhythm n=830 (2.07%)

Entire eligible cohort with available initial rhythm n=39,330

Initial shockable rhythm (VF/VT/Unspecified shockable rhythm) n= 5,356 (13.6%)

Initial non-shockable rhythm (PEA/Asystole/Unspecified non-shockable rhythm) n=33,974 (86.4%)

Conversion to subsequent shockable rhythm (defibrillated at prehospital or ED) n=2,691 (6.8%)

Remain in non-shockable rhythm (not defibrillated) n=31,283 (79.6%)
## Results – Multivariate analysis

<table>
<thead>
<tr>
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<th>The entire eligible cohort</th>
<th>Initial non-shockable rhythm subgroup</th>
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<tbody>
<tr>
<td><strong>Reference – Remain in non-shockable rhythm</strong></td>
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<tr>
<td>Initial shockable rhythm</td>
<td><strong>4.47 (3.31-6.03)</strong>*</td>
<td>1.59 (0.56-4.48)</td>
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<tr>
<td>Conversion to subsequent shockable rhythm</td>
<td>1.53 (1.13-2.08)*</td>
<td><strong>1.42(1.08-1.87)</strong>*</td>
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<td>ROSC at scene or ED</td>
<td><strong>6.1 (5.06-7.34)</strong>*</td>
<td>2 (1.1-3.65)*</td>
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<td>Survival-to-discharge</td>
<td><strong>11.35 (9.21-14)</strong>*</td>
<td>5.12 (3.5-7.48)*</td>
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<td>Good post-arrest cerebral performance</td>
<td>5.39 (4.32-6.73)*</td>
<td><strong>5.08(4.17-6.2)</strong>*</td>
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<td>Good post-arrest overall performance</td>
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Conclusion

- Initial shockable rhythm $\rightarrow$ the strongest predictor for survival
- Subsequent shockable rhythm $\rightarrow$ better post-arrest survival and neurological outcomes
- Suggests the importance of early resuscitation efforts even for initially non-shockable rhythms
- Need for post-resuscitation treatment (TTM/PCI/ECMO) for subsequent shockable rhythm
THANK YOU