Monitoring System of Regional Cerebral Oxygen Saturation (rSO₂)
During Pre-hospital Cardiopulmonary Resuscitation

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Backgrounds

- It is very difficult to recover without neurological deficit in out of hospital cardiac arrest (OHCA).
- rSO₂ (regional cerebral SO₂) may predict neurological outcome or return of spontaneous circulation (ROSC) (Ito et al. Resuscitation 2012, Ahn et. al Resuscitation 2013)
- To establish the monitoring system of rSO₂ in patients with cardiopulmonary arrest (CPA) from pre-hospital.
- To clarify the changes in rSO₂ during cardiopulmonary resuscitation (CPR).

Objective

- To establish the monitoring system of rSO₂ in patients with cardiopulmonary arrest (CPA) from pre-hospital.
- To clarify the changes in rSO₂ during cardiopulmonary resuscitation (CPR).

Methods

Patients are all the CPA patients who got CPR and were transferred by Emergency response vehicle (ERV) of Nagasaki University Hospital. Using the portable Near Infrared Spectroscopy (NIRS), rSO₂ was measured continuously during pre-hospital CPR.

Results

- EMS call ~ ERV arrival (rSO₂ monitoring)
- ERV arrival ~ Hospital arrival (Tracheal intubation)
- Tracheal intubation ~ ROSC

<table>
<thead>
<tr>
<th>rSO₂</th>
<th>ROSC</th>
<th>non-ROSC</th>
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<tbody>
<tr>
<td>Time 1</td>
<td>EMS call ~ ERV arrival</td>
<td>rSO₂ value (first touch)</td>
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<tr>
<td>Time 2</td>
<td>EMS call ~ Hospital arrival</td>
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Conclusions

- We developed the rSO₂ monitoring system during pre-hospital CPR. This system made it possible to evaluate the cerebral oxygenation about in 15 minutes from EMS call.
- rSO₂ significantly increased after ROSC, but not after intubation.
- There was no significant difference in rSO₂ between ROSC and non-ROSC during pre-hospital CPR.