Brain Regional Oxygen Saturation Monitoring by Emergency Medical Staff for Goal-Directed Resuscitation

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Purpose: The purpose of this study is to investigate the effectiveness of brain regional oxygen saturation (rSO₂) measurements by emergency medical staff (EMS) on ambulances for goal directed cardio pulmonary resuscitation (CPR) in out of hospital cardiac arrest (OHCA) patients.

Methods: We studied consecutive 114 cases of OHCA transported to 2 facilities in 8 ambulances.

Results: We could measure rSO₂ values in 33 of the 114 cases. We measured the increase in rSO₂ value in 20 (69%) of the 29 cases without prehospital return of spontaneous circulation (ROSC). However, in 10 (30%) of all 33 cases, we also observed “mostly dead cases” whose rSO₂ value does not be elevated after CPR and / or ROSC. The rising rSO₂ value by CPR by EMS on ambulance was higher in patients with survival after 90 days (n=2) than in those who did not survive after 90 days (n=31) (median [IQR]; 36[32-40] % versus 0[0-6] %, p=0.07). In some cases we confirmed that ROSC and pulseless electrical activity can detect early rSO₂ measurements (Figure). In 21 (66%) of the 33 cases, the rSO₂ value was the lowest (=15%) at the start of measurement in the ambulance, suggesting the existence of a “transport gap,” which makes it difficult to maintain the quality of CPR during patient movement to an ambulance.

We confirmed that ROSC and pulseless electrical activity can detect early rSO₂ measurements.

Conclusion: These findings indicated that rSO₂ measurements in OHCA patients may be useful for monitoring the quality of CPR evaluation, which enable goal-directed resuscitation.

Monitoring device:
INVOS 5100C
(MEDTRONIC)
Analytic tool:
INVOS analytic tool version
1.2.1

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