47 CORRELATION OF EEG-BASED BRAIN RESUSCITATION INDEX (EBRI) AND END TIDAL CO₂ IN PORCINE CARDIAC ARREST MODEL: EBRI-ONE TRIAL

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Aim Evaluation and monitoring of brain viability is important during resuscitation of cardiac arrest. We developed non-invasive EEG-based brain resuscitation index (EBRI) and evaluated correlation EBRI and end-tidal CO₂ (ETCO₂).

Method A randomised crossover animal experimental study using porcine cardiac arrest model was designed. After 1 min of untreated ventricular fibrillation, alternation of high quality CPR (compression depth 5 cm and compression rate 100/min) and low quality CPR (compression depth 3 cm and compression rate 60/min) was performed for every 50 s in 10 phases. EBRI was calculated from selected single EEG channel which have the lowest noise. Mixed model analysis was conducted to compare the differences of haemodynamic parameters, ETCO₂ and EBRI between high quality CPR period and low quality CPR period. Pearson's correlation coefficient was calculated to assess correlation between EBRI and ETCO₂.

Results Experiment was performed in four female porcine (44.6±2.8 kg). EBRI and EtCO₂ was obtained according to quality of CPR received. Delta ETCO₂-based EBRI obtained during high quality CPR was significantly higher than delta EBRI of lower quality CPR (HQ : Median 0.1, (0.0–0.2), LQ: Median –0.1 (–0.2–0.0, p≤0.01). EBRI had statistically moderate positive correlation with ETCO₂ (r=0.51).

Conclusion In porcine cardiac arrest model, EEG-based Brain Resuscitation Index was successfully obtained during resuscitation and had statistically moderate correlation with ETCO₂.

Conflict of interest None

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48 TRENDS IN THE INCIDENCE AND OUTCOME OF PAEDIATRIC OUT-OF-HOSPITAL CARDIAC ARREST IN VICTORIA, AUSTRALIA

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Aim System-based improvements to the chain of survival have yielded significant increases in survival from out-of-hospital cardiac arrest (OHCA) in adults. Comparatively little is known about the long-term trends in incidence and survival following paediatric OHCA.

Method Between 2000 and 2016, we included paediatrics aged ≤16 years who suffered a non-traumatic OHCA in the state of Victoria, Australia. Trends in incidence and unadjusted outcomes were assessed using linear regression. Adjusted trends in event survival and survival to hospital discharge were assessed using multivariable logistic regression.

Results Of the 1301 paediatric OHCA attended by emergency medical services (EMS), 948 (72.9%) received an attempted resuscitation. The overall incidence of EMS-attended OHCA was 6.7 cases per 1 00 000 person-years, with no significant change over time. Although median EMS response times increased over time, the proportion of cases with OHCA identified in the call and receiving bystander cardiopulmonary resuscitation (CPR) also increased. Unadjusted event survival rose from 23.3% in 2000 to 33.3% in 2016 (p trend=0.007). Over the same period, survival to hospital discharge rose from 9.4% to 17.7% (p trend=0.04). After multivariable adjustment, the odds of event survival and survival to hospital discharge increased independently of arrest factors, by 7% (OR 1.07, 95% CI: 1.03, 1.12; p=0.001) and 8% (OR 1.08, 95% CI: 1.01, 1.15; p=0.02) respectively. Bystander CPR and OHCA identification in the call were not associated with survival.

Conclusion In our region, survival following paediatric OHCA increased significantly over a 17 year period. However, the factors contributing to this improvement require further investigation.

Conflict of interest None

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49 EFFECT OF HYPOTHERMIA ON OUT-OF-HOSPITAL CARDIAC ARREST PATIENT WITH CHRONIC KIDNEY DISEASE

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Aim Therapeutic hypothermia is performed to improve the OHCA patient's neurologic outcome. It is unclear whether the effect size of therapeutic hypothermia differs according to the baseline kidney function.

Method OHCA patients transported to ED from 2013 to 2015 in South Korea were analysed. OHCA Patients due to cardiac cause at age 15 or older, and who survived to admission were included. Those who did not get CPR or without information about neurologic outcome (CPC) at discharge were excluded. Main Exposure was whether therapeutic hypothermia was done at the hospital. Primary and secondary outcomes were hospital survival and CPC score. Multivariable logistic regression was used to calculate the adjusted odds ratios with 95% confidence intervals. To compare the effect size of the therapeutic hypothermia by underlying kidney dysfunction (CKD-nonHD, HD) and normal kidney function, interaction term (hypothermia*CKD) was added to the final model.

Results Totally 8170 patients were analysed. 4655 (56.98%) patients died and 3515 (43.02%) survived to discharge. Only 2118 (25.92%) had good neurologic outcome. The AOR of hypothermia were 1.70 (1.50–1.9) for the survival rate and 1.00 (0.88–1.18) for the favourable neurologic outcome. In interaction model, the AORs for survival rate of hypothermia were 1.76 (1.54–2.02), 1.27 (0.59–2.74) and 1.8 (0.60–1.96) in non-CKD, CKD-nonHD, and HD group respectively. Also, the AORs for good neurologic outcome of hypothermia were 1.08 (0.93–1.25), 0.37 (0.10–1.42) and 0.26 (0.09–0.73), respectively.