Halvtidskontroll

Fredagen den 12:e April 2019

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Tid: Kl 11:00

Background

Ischemic brain injury remains the main cause for death and disability in out-of-hospital cardiac arrest (OHCA) patients after return of spontaneous circulation (ROSC). In experimental studies, exposure to arterial partial pressures of oxygen (PaO₂) outside normal range has shown to augment the brain injuries sustained during cardiac arrest. Clinical observational studies do not uniformly confirm these results. Exposure to arterial pressures of carbon dioxide (PaCO₂) outside normal ranges after OHCA has in observational studies been associated with good as well as poor outcome. The reasons for the outcome diversity in studies investigating the associations of PaO₂ and PaCO₂ in OHCA patients are not known.

After ischemic brain injury and ROSC, biomarkers of neurological injury are released into the bloodstream. Investigations have shown that blood levels of biomarkers are predictive of poor outcome after OHCA. The biomarker in clinical use, neuron specific enolase (NSE) is lacking robustness to predict outcome singularly and its presence outside the central nervous system increases the risk for false positive results.

The association between PaO₂, PaCO₂ and levels of biomarkers of neurological injury after OHCA is largely unstudied and the association to long term neurological outcome is not clarified.

Research questions

A. Do PaCO₂ levels outside normal ranges show an association with neurological outcome 6 months after OHCA?
B. Do PaO₂ levels outside normal ranges show an association with neurological outcome 6 months after OHCA?
C. Is there an association of PaCO₂ and PaO₂ after ROSC and serum levels of serum biomarkers of neurological injury?
D. How accurate is the prognostic performance for neurological outcome at 6-month follow-up of the two serum biomarkers of neurological injury, Glial Fibrillary Acidic Protein (GFAP) and Ubiquitin C-terminal hydrolase L1 (UCHL-1)?
E. Do single PaO₂ and PaCO₂ levels outside normal range during the first 24 hours after admission to hospital show an association with CPC at discharge.

Research questions A, B and C (for one biomarker, serum Tau) were tested in post-hoc investigations in a large and homogenous cohort of 939 unconscious OHCA patients included in the Target Temperature Management trial. For the remaining biomarkers in question C and to answer question D the same cohort will be investigated. For Question E a larger cohort from the International Cardiac Arrest Registry (INTCAR) 2.0 database will be used.

Preliminary results

Neither PaCO₂ nor PaO₂ levels outside normal range showed an association with neurological outcome in OHCA patients at 6-month follow up or with serum Tau levels.

Significance
PaCO₂ and PaO₂ did not show a neurological outcome modulating effect. There is lacking knowledge of the effects of PaCO₂ and PaO₂ on biomarkers of neurological injury.

Publication list
