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Is cerebral oxygen saturation an effective method to terminate or continue cardiopulmonary resuscitation in pediatric patients?

Murat Duman, Aykut Caglar, Anil Er, Emel Ulusoy, Fatma Akgul, Hale Citlenbik and Durgul Yilmaz
Dokuz Eylul University, Turkey

Objective: Near infrared spectroscopy (NIRS) is a new technology for monitoring of cardiopulmonary resuscitation (CPR). The use of NIRS has advantages to monitoring cerebral oxygenation in the cardiac arrest patients. In this prospective study, the efficacy of the NIRS device on the determination of ROSC or futility of CPR was investigated in pediatric out-of-hospital cardiac arrest patients in the emergency department.

Methods: All the out-of-hospital cardiac arrest patients who admitted to our pediatric emergency department were included in this prospective study. All patients were monitored via NIRS besides standard monitoring during CPR. Cardiopulmonary resuscitation was performed accordingly Pediatric Advanced Life Support 2010 guideline.

Results: 10 patients were included to this study. The median (IQR) age of patients was 40.0 (14.0-88.2) months. Three (30%) of 10 patients had been achieved sustained ROSC. Abruptly increments in cerebral regional oxygen saturation (CrSO_2) were observed in all these three patients. Minimum values of the CrSO_2 were significantly higher and the percentages of the median times under the 30% of CrSO_2 were significantly lower in the ROSC group ($p=0.02$, $p=0.02$).

Conclusions: Our study indicated that low CrSO_2 value can be a predictive factor for futility of CPR. Additionally, abruptly increment of CrSO_2 during CPR can be an indicator for ROSC but on-going high level of CrSO_2 values should be maintain for sustained ROSC.

mduman@deu.edu.tr

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