Rognås et al. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine 2014, 22(Suppl 1):O5
http://www.sjtrem.com/content/22/S1/O5

SCANDINAVIAN JOURNAL OF
trauma, resuscitation
& emergency medicine

ORAL PRESENTATION Open Access

Can an initial end-tidal CO_2 <1.33 kPa predict lack of return of spontaneous circulation during pre-hospital cardiac arrest?

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From London Trauma Conference 2013
London, UK. 10-13 December 2013

Background

Previous results have indicated that an initial end-tidal (ET) CO_2 < 1.33 may be used as a cut-off value for when return of spontaneous circulation (ROSC) can be achieved during pre-hospital cardiac arrest [1].

We aimed at validating these results in our anaesthesiologist-staffed pre-hospital critical care system.

Materials and methods

We prospectively registered data [2] according to the Utstein-style template for reporting data from pre-hospital advanced airway management [3] from February 1st 2011 to October 31st 2012. Included were consecutive patients at all ages with pre-hospital cardiac arrest treated by eight anaesthesiologist-staffed pre-hospital critical care teams in the Central Denmark Region.

Results

We registered data from 595 cardiac arrest patients; in 58.9 % (n=350) of these cases the pre-hospital critical care teams performed pre-hospital endotracheal intubation.

An initial end-tidal CO_2 measurement following pre-hospital endotracheal intubation were available in 270 cases.

We identified 22 patients, who had an initial $ETCO_2$ below 1.33 kPa.

Four of these patients achieved return of spontaneous circulation. All four patients were admitted to hospital, three with stable circulation and one with ongoing automated CPR due to recurrent cardiac arrest.

Conclusion

Our results indicates that an initial $ETCO_2$ below 1.33 kPa during pre-hospital cardiac arrest should not be used as a cut-off value for the achievability of return of spontaneous circulation.

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Published: 7 July 2014

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doi:10.1186/1757-7241-22-S1-O5
Cite this article as: Rognås *et al.*: Can an initial end-tidal CO_2 <1.33 kPa predict lack of return of spontaneous circulation during pre-hospital cardiac arrest? *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* 2014 **22**(Suppl 1):O5.

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