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Letter to the Editor

The need for comprehensive NIRS-measurement from on-scene treatment to post-ROSC phase

To the Editor,

With great interest we studied the recent publication by Takegawa et al.¹ discussing their experiences with cerebral regional oxygen saturation (rSO₂) during cardiopulmonary resuscitation (CPR). Near-infrared-spectroscopy (NIRS) is an innovative technology in prognostication – and probably also therapeutic guidance – for medical teams assessing patients having a cardiac arrest (CA). However, due to variable and conflicting reports in the past² this new tool is partly seen with scepticism. In front of this background, in our opinion it is imperative to act cautiously and only produce well-defined conclusions – therefore, we would like to make a few comments.

The authors incorrectly state that “*the potential for assessing the trend of the rSO₂ value has not been discussed when determining the probability of return of spontaneous circulation (ROSC)*”, since obtaining not punctual but dynamic rSO₂ values for prognostication during CA has been a common opinion in literature for quite some time.^{2,3} Moreover, their findings’ novelty is stressed – but we have previously reported that delta rSO₂-levels during CPR can predict ROSC and favourable neurological outcome, and even suggested respective thresholds.² It would have been of paramount interest to clinicians if Takegawa et al. had applied those in their retrospective data analysis – or defined their own. Moreover, the authors fail to provide a full data set on CPR details (e.g. no-flow time, missing CPR duration), therefore not reporting essential co-factors that might have influenced results if not balanced between ROSC and non-ROSC subgroups.

As a key message, Takegawa et al. suggest NIRS to be a method for reducing pauses during CPR due to avoidance of unnecessary rhythm checks, which could lead to higher rSO₂ values and better outcomes.⁴ This practically relevant argument can, however, not be deducted from the authors’ data and should therefore only be mentioned as a future prospect.

Lastly, no information on the patients’ neurological outcome is given. While the administration of epinephrine during CPR may indeed lead to higher rSO₂-values, a higher rate of ROSC and hospital discharge, it may not necessarily lead to fully restored cerebral function.⁵ Since intact neurologic performance is a crucial factor for

CA survivors and relatives, it should be mandatorily reported when talking about outcome prediction performance of a new technology or method.

In summary, we fully agree that rSO₂-values “[. . .] *could be useful in guiding cardiopulmonary resuscitation*”, but suggest a more comprehensive way of research into the topic: for example, through rSO₂-measurements from the out-of-hospital cardiac arrest environment until a stable post-ROSC in-hospital phase, completed with a full data set of short- and long-term outcome parameters. By that, truly clinically relevant dynamic rSO₂ cut-offs for decision making may be just around the corner.

Conflicts of interest

The authors declare that they have no conflict of interest.

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