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AWAreness during REsuscitation and EEG activity

To the Editor,

We read with great interest the recent article by Parnia et al. describing EEG recordings from patients undergoing in-hospital cardiac arrest.[1] The difficulty accomplishing this first of its kind feat is evidenced by the fact that the multi-site research team were able to obtain interpretable EEG activity from only 53 of the 567 patients studied. They reported that almost half of the patients had suppressed or absent brain electrical activity (flatline EEG), but about half had some near normal/physiological EEG activity (delta, theta, alpha, and beta rhythms) suggestive of the emergence of consciousness, despite marked cerebral ischemia and the absence of any outward signs of being conscious.

They reported a spectrum of cognitive activity including awareness among 11 patients and, in 6 patients, recalled experience of death ("near-death experience"). They concluded that "The emergence of normal EEG may reflect a resumption of a network-level of cognitive activity, and a biomarker of consciousness, lucidity and RED (authentic 'near-death' experiences)."

However, we would caution against the premature assumption that the observed EEG activity was truly a biomarker of consciousness based on this study, as the authors did not report any of the patients who reported awareness or NDEs also having EEG activity consistent with consciousness, nor any of the patients who had EEGs consistent with consciousness also reporting NDEs or other kinds of awareness. That is, no correlation was found between reported NDEs or other cognitive awareness and specific electrical activity in the brain. Indeed, they noted in Figure 2 that "two of the 28 interviewed subjects had EEG data, but, weren't among those with explicit cognitive recall."

A further caution regards how specific and trustworthy EEG recordings can be during CPR with external chest compression and electrical defibrillation. Although the authors state that the team took measures to account for motion artifact, it is unclear how they were able to separate electrical activity of the brain from muscle electrical activity or the effects of the resuscitation attempts.

The absence of overlap between patients with EEG activity consistent with consciousness and those reporting conscious experience during the cardiac arrest suggests that the observed EEG activity in patients with cardiac arrest is not in fact a marker of conscious experience. As a result, it is difficult to draw any conclusion from this study about the role of brain electrical activity in NDEs or other cognitive recall. Indeed, the authors appropriately cautioned at the end of this paper: "Although systematic studies have not been able to absolutely prove the reality or meaning of patients' experiences and claims of awareness in relation to death, it has been impossible to disclaim them either. The recalled experience surrounding death now merits further genuine empirical investigation without prejudice."

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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