Long-Latency Sensory-Evoked Responses and Prognosis in Cardiac Arrest Survivors

To the Editor:

We read with great interest the recent article published in *CHEST* (November 2014) by Ben-Hamouda et al. Persistent coma after global cerebral ischemia is a serious clinical disorder, and this condition is not rare among patients resuscitated from cardiac arrest. The prospect of neurologic recovery is poor for many patients, and clinicians are often confronted with the question of whether continuing treatment is worthwhile. To answer this question, it is important to know which clinical, neurophysiologic, imaging, and laboratory features determine prognosis. In this robust article, all of them are perfectly exposed, and a multimodal approach is highlighted with the algorithm. The authors have made a significant contribution to current literature.

However, regarding neurophysiologic assessment of these patients, we would like to emphasize that median nerve somatosensory evoked potential can be used to predict not only poor prognosis, based on bilateral absence of early cortical response (N20), but also awakening, through assessment of long-latency sensory-evoked potentials (N35 and N70), not mentioned by the authors. In particular, a previous study showed that patients with an N70 peak latency within 130 milliseconds had a good recovery (positive predictive value of 98%).

As discussed in the article, presence of mismatch negativity in a comatose patient is superior to somatosensory-evoked potential for the prediction of awakening (100% specificity), but we do not value it because standard analysis requires the detection of a robust N1 component of the auditory-evoked potential, resulting in exclusions of a high percentage of patients from the final analysis. Thus, in a survivor of cardiac arrest, the presence of N20 with normal amplitude and latency does not mean that the patient will recover consciousness, having a weak prognostic value. In this clinical scenario, we also analyze long-latency responses (Fig 1), and if N70 is present and not delayed beyond 130 milliseconds, prediction of awakening is possible with great certainty.

Alberto Grande-Martín, MD
José Manuel Pardal-Fernández, PhD
Virgilio Córcoles-González, MD
Albacete, Spain

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*Editor’s Note: Authors are invited to respond to Correspondence that cites their previously published work. Those responses appear after the related letter. In cases where there is no response, the author of the original article declined to respond or did not reply to our invitation.*

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**Figure 1** – A. Somatosensory evoked potential from two patients who remained in coma 24 h after cardiac arrest. Stimulus applied to the median nerve left (left column) and right (right column). Vertical line indicates 70 ms. A. Presence of N20 (asterisk) and N70 (arrow); the patient survived and recovered well. B. Presence of N20 (asterisk), but N70 peak is absent (circle); the patient died.
Response

To the Editor:

We thank Dr Grande-Martín and colleagues for their very valuable comment on our recent article1 in CHEST concerning prognostic assessment of postanoxic comatose patients. They rightly point out that multimodality is of paramount importance in approaching coma prognostication in this setting and add information about the role of middle-latency somatosensory-evoked potentials (N35, N70) as a tool to predict favorable outcome. In fact, this technique was described in detail some time ago,2 but its robustness has been put into question in a large Dutch study, which reported that only 28% of patients with N20 and N70 had a good outcome,3 and it is not widely used. A recent retrospective study reappraising this approach correctly points out that additional prospective work must be performed.4

Dr Grande-Martín and colleagues rightly remind us that assessment of the auditory mismatch negativity needs the presence of an N1 potential. Our group, however, has recently described an automated mismatch negativity algorithm based on an auditory oddball paradigm that does not depend on this assumption; by adding information on patients who will awake, this tool seems indeed to significantly increase the performance of outcome prediction in comatose patients after cardiac arrest.5

As with the N70, however, this method is still not widely used and has not been validated independently. Like Dr Grande-Martín and colleagues, we believe there is an urgent need for refined prognosticators of good outcome. Only future, large-scale studies will allow the generalized implementation of these methods in the prognostication algorithm.

Andrea O. Rossetti, MD
Mauro Oddo, MD
Lausanne, Switzerland

References