Reviewer's report

Title: Observations on comatose survivors of cardiopulmonary resuscitation with generalized myoclonus

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Reviewer: Jean-Miche Guérit

Reviewer's report:

General
This is an interesting paper presenting serial EEG recordings in comatose CPR survivors with generalized myoclonus. Its aims are threefold:
To test whether improvement in critical care medicine improved the outcome of these patients. The answer is negative, at least for the 50 examined patients. This is not actually new, as confirmed by the literature review in the discussion (p. 6).
To present serial data recording in order to precise the temporal dynamics of EEG abnormalities. This is undoubtedly the main specificity and interest of this paper. With the possible exception of CGED, what the authors observed clearly correspond to what is usually labelled on as malignant EEG patterns. The authors judiciously stress on the transient character of these patterns with a possibility of shift from one pattern to the other.
To situate this pattern with respect convulsive status epilepticus.
The authors raise the issue whether severe deafferentation can really coexist with still functioning efferent pathways. The underlying issue is whether deafferentation would be the consequence of a white-matter disorder (in which case the coexistence with intact efferent pathways would be hardly conceivable) or whether it would correspond to an intra-cortical phenomenon with predominant involvement of some cortical layers. Another observation favouring the hypothesis of a different stage (when compared to status epilepticus) is the fact that, contrary to what is observed in patients with status epilepticus (and probably in patients with CGED, too), somatosensory EPs in patients with BS disclose absence of cortical activities. This holds also true for the 95% to 90% of cases of anoxic patients with alpha and/or theta coma who present a poor evolution.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

The paper must be edited by an English native.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. Did the 2 patients with an alpha-coma and the single patient with a flat EEG within the first 24 hours present with myoclonic discharges at the time of recording?
2. Did the need for mechanical ventilation and the loss of brainstem reflexes span over the whole period of monitoring?
3. Brain death is a rather unusual mode of evolution of anoxic coma. Did other intercurrent events occur?
4. Discussion: typing error We were able to find another furu more recently reported patients .

Discretionary Revisions (which the author can choose to ignore)
I have 2 questions:

1. One important question is whether the authors consider it worth continuing intensive care in these patients or whether they would be ready to stop it as soon as this situation is recognized, based on clinical examination and EEG recording. Do they consider EEG recording as sufficient? If no, would they be ready to stop resuscitation on the additional basis of absent cortical components (with proof of persistence of sub-cortical ones) in somatosensory evoked potentials?

2. When considering Figure 3, I wonder whether any transition can be really observed. Indeed, while there were frequent swaps between BS and CGED and relatively frequent transitions from epileptiform patterns toward alpha/theta, flat, and isoelectric EEGs, there were only two instances of transitions from alpha/theta toward epileptiform patterns. Whether the alpha-theta would correspond to some intermediate pattern between the epileptiform one and flat or isoelectric EEG could be suggested when considering Figure 3. However, I wonder whether patients with the alpha-theta pattern were under different drug regimens as those exhibiting BS and/or CGED. Indeed, several alpha/theta patterns were observed from the 1st day, at which period they should be expected to undergo drug treatment. That is, the authors should clearly explain how exactly they ruled out drug influences to explain the alpha-theta pattern (as already suggested in the literature).

**What next?:** Accept after minor essential revisions

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No