Reviewer's report

Title: Assessment of visual fixation in post-comatose states: use a mirror

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Reviewer: Pietro Pietrini

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This paper assesses the feasibility of using mirror (and thus to use self-referential images) to elicit fixation. Fixation can be a useful way to distinguish vegetative state/unresponsive wakefulness (VS/UWS) syndrome and minimally conscious state (MCS). As a matter of fact, by using a mirror the authors were able to elicit fixations in 39 out of 43 MCS patients and in no patients with VS/UWS. Only in one subject it was possible to elicit fixation with light but not with the mirror. The mirror was able to elicit significantly more fixation as compared to light and ball.

The paper is well-written, concise and straightforward. The topic is highly interesting and has a potential important implications also for clinical purposes. However, I believe that some points need to be clarified or re-written to improve clarity.

1) In the abstract it is stated that the “Visual fixation plays a key role in the differentiation between vegetative state/unresponsive wakefulness (VS/UWS) syndrome and minimally conscious state (MCS)”. Thus, the main results of the paper should be that the mirror elicited fixation is a very sensitive, specific and accurate test to differentiate the two clinical conditions. This is indeed the main take-home message.

2) In the discussion a possible explanation for the fact that one subject responding to light did not respond to mirror was that mirror was presented as the last stimuli in randomized order across subjects. Would it be possible to re-test the subject with the mirror first? Even if this would break the randomization it would strengthen the interpretation of the results. Would it be possible to have other explanations to support this interpretation (for instance is the subject low in the CRS scale)?

3) A typo is present in the figure 1 caption “unresponsive”

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests