Reviewer’s report

Title: Effects of high-frequency Transcranial Magnetic Stimulation on functional performance in participants with incomplete spinal cord injury: study protocol for a randomized controlled trial

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Reviewer: Giuseppe Lucente

Reviewer’s report:

This is an interesting work on the use of rTMS for the treatment of Spinal Cord Injury. Indeed I have several comment that I believe could strengthen the value of the study.

1. Introduction/Methods

You do not specify why you chose this stimulation paradigm. You will administer an High frequency rTMS which is known to ameliorate pain and motor function as well as spasticity but the mechanism underlining those effects are not stated.

2. Inclusion criteria:

- It is not stated what kind of rehabilitation will receive the subjects. I assume that they will be enrolled from different centres so It might be not homogenous. It would be important to define the modalities if the received treatment.

- It is stated that an EEG will be performed to each participant to identify the absence of electrical abnormalities. It is good that you can do it but it is not performed routinely in subjects undergoing TMS treatment and you should then define what abnormalities would be an exclusion criteria.

3. Blinding:

- It is not clear to me if the investigator who is actually administering the treatment will be blind to it. Given the experimental setting you describe it is unlikely.

- The main problem with cross-over studies with TMS is the difficulties in obtaining a valuable sham in subjects whom already received active treatment. It would be interesting if you could explain more extensively the approach to this problem.

4. Intervention:
- Please revise English grammar of this section. It is not clear.

-On the rMT determination, you should specify the target muscle (i.e. Abductor pollicis brevis) and not "thumb".

- You did not state the orientation of the coil. You assume that stimulating the vertex you can obtain a symmetrical stimulation of both motor areas corresponding to the lower limbs. This is not completely true given that the orientation of the figure-of-8 coil to stimulate the medial motor cortex has to be parallel to the midline and it does depend on the side of the coil and the direction of the current flow (Rossini, Clinical Neurophysiology Volume 126, Issue 6, June 2015).

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