Reviewer's report

Title: Principles of brain plasticity in improving sensorimotor function of the knee and leg in healthy subjects: A double-blind randomized exploratory trial

Version: 2 Date: 13 July 2009

Reviewer: Eleni Kapreli

Reviewer's report:

In general, the manuscript has been significantly improved with the corrections suggested by reviewers. The revision features the originality of the current work which deals with new aspects of rehabilitation taking advantage of brain reorganization. I would like authors further to answer to the following comments:

#minor essential revisions

Methods

• Why did you use right leg?? Did you check for footedness?? How did you ensure that all your subjects were right or left foot dominant?? Handedness and footedness influence brain activation during movement of upper or lower limb respectively. Additionally, this factor also influences function outcomes. Please explain and include in methods. In case you did not take this factor under consideration please discuss it as a study limitation at the end of your discussion section.

AUTHORS’ RESPONSE AND ACTION

We agree that hand dominance has an influence on brain activation. However, the inconvenience by using “dominant” leg in healthy subjects is that it is determined in different ways: by right- and left-hand preference (e.g., Barber et al, 1990), regarding which leg the subjects prefer to kick a ball with (e.g., Greenberger & Paterno, 1995), by jump preference (e.g., Nyland et al, 1994), or by stance preference when kicking a ball (e.g., Nyland et al, 1997). For this reason we did not determine leg dominance. Moreover, in our previous studies on healthy subjects, we have found no differences between the right and left legs for knee kinesthesia, muscle strength or the one-leg hop test for distance. In addition, it was not possible to assess both legs in the current study since the amount of EMLA that can be used is limited to 60 grams (we used 50 grams). Therefore, only one leg was tested. Based on our results from previous studies showing no differences between the right and the left legs, we believe that the results most likely would have been the same irrespective of whether the right leg or the left leg was used. The right leg was tested in all subjects. Possible bias from choosing the right leg should be minimized due to our study design (RCT). In our study, we hypothesized that temporary anesthesia of the skin area above and below the knee would improve sensorimotor function of the ipsilateral knee and
leg. To clarify that all assessments were done on one leg only, the following has been included in the method section: “EMLA/placebo was applied and all tests were performed on the right leg only.”

Second revision comment

I insist that it is a limitation of your study that you did not test footedness. I recommend you write it in your manuscript as a limitation and defend it with the same way you did above.

• Authors give as reason of lack of effect the uninjured subjects that they include in their study. However, the two previous studies that they mentioned had found positive results included similarly uninjured subjects in their study.....Could authors explain why??? Please add a comment in discussion section.

AUTHORS’ RESPONSE

This has been clarified in the discussion (page 17): “…However, the cortical area of the knee is smaller than the cortical area of the hand [12] [13]. Thus, larger effects of treatment are needed in order to detect an increase in the cortical area of the knee than in that of the hand. In line with this reasoning, we found no effect of temporary cutaneous anesthesia of adjacent body parts in the measures of sensory or motor functions of the knee in healthy subjects, whereas previous studies reported improvement in sensory function of the hand and foot in healthy subjects after such treatment [22] [24]....“

Second revision comment

I do not think that this is a convincing comment.... However, if you still insist in this comment at least please add some references for the sentence “larger effects of treatment are needed in order to detect an increase in the cortical area of the knee than in that of the hand”.

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