Reviewer's report

Title: Changes in joint coupling and variability during walking following tibialis posterior muscle fatigue

Version: 3 Date: 11 November 2010

Reviewer: Robert Butler

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The purpose of the study was to examine the effect of posterior tibialis fatigue on lower extremity coupling. The authors perform a thorough job of reviewing and applying the pertinent literature. The study is well controlled and the methods are sound. Some clarification is appreciated regarding the statistical analysis. In lieu of this concern, the results are appropriate and the discussion is not overstated. The discussion may assist from some stream lining or improvement of the integration of some of the material.

Abstract: The second half of the first sentence of the conclusion section should be reigned in to focus on the specific results of the study.

Introduction:
Second paragraph, sentence 3-4. Why would it be expected that patients with PTTD would be different than an acute weakness of the tibialis posterior?
Third paragraph, 4th sentence, Kulig et al. I would recommend another sentence or two about this study and the specific findings that support this model of fatiguing the tibialis posterior.
Fifth paragraph, 3rd sentence, remove “more”.
Sixth paragraph, 5th sentence, what is the aforementioned study in reference to?
Methods, Procedures, 1st sentence, missing a reference.
Methods, Procedures, 2nd sentence, how much time was allowed for the subjects to become accommodated to the treadmill walking? How was walking speed determined?
Methods, Procedures, 2nd paragraph, last three sentences. I am confused as to whether you utilized 10 trials or 5 trials for the data processing? If a different number of trials were used please provide a rationale for this.
Data Analysis, Is there a reason why a two-way ANOVA was not conducted (condition x phase) as opposed to the planned comparisons t-tests?
Data Analysis, 4th sentence, typically p values are reduced to reduce type I, as opposed to the stated type II error. Please confirm or refute if I am thinking of this differently than it is meant to be interpreted.
Results, Joint Coupling, I believe a word is missing between pre- post.
Results, Joint Coupling 2nd sentence, break up sentence to improve clarity.
Results, Coupling Variability, I believe a word is missing between pre- post. However since this is the second time I may be missing something.

Discussion, 2nd paragraph, 2nd sentence, “the results” is referring to which study, Kulig et al. or the current study

Discussion, 3rd paragraph, last sentence, The comparison with this study and prior studies just suggest that the decreased strength is associated with the pathology. I think extrapolating to the dysfunction of the muscle may be a bit overstated since dysfunction could be associated with factors other than strength alone.

Discussion, 4th paragraph, missing a word here somewhere. Please revise.

Discussion, 6th paragraph, last sentence, recommend placing this at the end of the prior paragraph. Paragraph 6 weaves a nice theory about the changes that are occurring. However there is not sufficient evidence to make a “conclusion” based on this theory. The conclusion could be made at the end of the prior paragraph when discussing the changes in coupling that occurs with fatigue.

Discussion, 7th paragraph, So since you state your results are different due to chronicity of the pathology. Do you feel your results would differ in patients with chronic PTTD?

Discussion, 8th and 9th paragraph, should be trimmed down to look at the differences that interventions (strength and fatigue) have on joint variability.

Discussion, 10th paragraph, 3rd sentence, could the reduced posterior tibialis function simply lead to increased activation levels of other inverters with the goal of compensating for the loss of force?

References. Complete #36

Figures and Tables are put together well.

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

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

**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.