Author's response to reviews

Title: Effect of a 6-week dynamic neuromuscular training programme on ankle joint function: A Case report

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Author's response to reviews: see over
Reviewer's report

Title: Effect of a 6-week dynamic neuromuscular training programme on ankle joint function: A Case report

Version: 1 Date: 1 December 2010
Reviewer number: 1

Reviewer's report:

General Comments
This is a clearly written manuscript that addresses appropriate clinical questions. Overall, there is a need to improve the purpose and describe a few more details in the Methods and Discussion

Specific Comments
Background: The authors have summarized appropriate literature. However, a logical argument for only creating a case study rather than an expanded, randomized control trial is not evident. The authors address the limitation that a case study has at the end of the manuscript, however, it would help the reader to understand the rationale that a single case is presented instead of perhaps waiting to compile a larger data set.

AUTHOR COMMENT: The rationale for undertaking a case study was that the primary author was required to conduct a minor research thesis for part fulfilment of his MSc degree program. Due to the fact that this was a taught MSc degree, the thesis component was only a minor section of the over degree and thus it was not feasible to conduct a large scale RCT. We have expanded a number of lines to read as follows “In October 2009 the opportunity arose to enrol the athlete who was now in his final year as an under-graduate physiotherapy student in a dynamic neuromuscular training programme. This opportunity arose as the primary author (...) was due to undertake a research project for the part fulfilment of his M.Sc. degree, and subsequently chose to design a case study to investigate the effect of a dynamic neuromuscular training programme on ankle joint function is a subject with CAI.” We hope that these lines are sufficient.

Background, 3rd paragraph, line 6: Suggest replacing “are now required” to “should”. I think the way its worded may be a bit strong.

AUTHOR COMMENT: This is now changed accordingly.

Methods: Please provide demographic information for your case subject. All that is known is that this was a 19 yr old male.

AUTHOR COMMENT: We have now added more details such that the sentence now reads “The 19-year-old athlete (caucasian male, height 1.83m, weight 83kg) was injured ...”

Methods, 2nd paragraph, line 8: Add “exercises” after “postural stability”

AUTHOR COMMENT: This is now changed accordingly.

Methods, 3rd and 5th paragraphs: How many times did the subject report a
giving way or rolling? How frequent were the episodes?

AUTHOR COMMENT: We have now added the line “The athlete complained of monthly episodes of giving way” to clarify this important issue.

Methods, 6th paragraph: The novelty of the case study is presented here with the primary purpose centered on jump landing. If this is the focus, then why were the SEBT, gait parameters and subjective measures included? The manuscript would benefit from a more defined purpose.

AUTHOR COMMENT: We believe based on a review of the literature that the novelty of the case is that no other research group has reported on the effects of a neuromuscular training programme on ankle joint positioning. In order to clarify the purpose we have added the line.

In addition to measures of ankle joint kinematics during jump landing we also investigated the effects of the intervention on other important aspects of ankle joint function, such as walking kinematics, postural stability as well as self-reported ankle joint function as measured by the CAIT.

Methods, “Walking”, 2nd paragraph: I don’t believe the use of reference #27 at the end of this paragraph appropriately supports this statement. Please check this.

AUTHOR RESPONSE: In the original manuscript we omitted a reference. Reference 27 is now appropriate.

Methods, “Treatment/Intervention”: Why was a 6-week intervention period employed? Please provide a rationale for this.

AUTHOR RESPONSE: We based our choice of treatment time on previously published literature. All the studies listed below utilized 6 weeks for an intervention period.

Bernier & Perrin (1998) = 6 weeks
Dochert et al. (1998) = 6 weeks
Eils & Rosenbaum (2001) = 6 weeks
Kaminski et al (2003) = 6 weeks
Kynsburg et al (2006) = 6 weeks
Ross et al (2006) = 6 weeks

Methods: In general, the manuscript could benefit from more detail on the processing of data. I.e., how were kinematic and GRF data filtered and processed? Because SD are provided in Table 2, I’m assuming that the scores represent a mean of the trials by the subject, but that would be helpful to see that stated specifically.

AUTHOR RESPONSE: We have now added extra information to detail that IC = point at which GRF exceed 10N.

AUTHOR RESPONSE: This has been clarified.

SEBT: The subject performed 3 reaches in each of the anterior, posterior-medial and posterior-lateral directions. The average value of the 3 reaches in each direction was used for further analysis.

Drop landing: The athlete performed 3 trials of both the drop landing and drop vertical jump in a counterbalanced sequence. The average value of the 3 trials was then utilized for subsequent
analysis to investigate the difference between the pre- and post-intervention angle of plantar flexion.

**Walking**: The athlete performed 10 gait trials at self-selected walking pace with the average value of the ten trials being utilized for the analysis of differences between the pre- and post-intervention conditions.

Results: In the SEBT data, there is a reference made that effect sizes are presented in Table 2. These don’t appear to be in the table, but I think this would greatly improve the data presentation. Ideally, effect sizes would be calculated using a the pooled standard deviations. However, with an n of 1, this becomes problematic. Therefore, I would encourage the authors to state in the Methods that a modified effect size calculation was used. Perhaps you could use the average of the two SD’s from the pre- and post-test?

**AUHTOR RESPONSE**: We have now included the recommendation of the reviewer. The following has been added

**Standardized mean difference**

A modified standardized mean difference was calculated for the outcome measures as follows: 

\[
SMD = \frac{\text{difference in mean outcome between groups}}{\text{mean of the SD of the pre- and post-intervention outcomes}}
\]

Results, “Walking”: I’m not sure you can say that a “significant” change in rear-foot angular displacement was not observed. Perhaps with the inclusion of the effect sizes, you can make this statement. Also, why did the authors not include the data for rear-foot angular displacement in Table 2?

**AUTHOR RESPONSE**: Points duly noted. Omission of the rear-foot angle from the table was a mistake and not intended. It is now included.

Discussion, 1st paragraph: I don’t feel that the authors can say that the sensorimotor insufficiencies “contribute to the development of CAI”. To my knowledge, there has not been a comprehensive, prospective study to examine the development from acute to chronic ankle injury. Perhaps changing the wording to “are associated with CAI” would be more appropriate?

**AUHTOR RESPONSE**: We have now included the recommendation of the reviewer.

Discussion, 3rd paragraph: I would suggest eliminating the last sentence that begins “The greatest improvement on the SEBT…” I don’t think there evidence exists that has quantified the center of pressure distribution during each of the reaches of the SEBT to support the statement that post-lat direction requires more lateral weight-bearing. Plus, I’m not sure that it adds much to the discussion of the finding.

**AUHTOR RESPONSE**: We have now included the recommendation of the reviewer.

Discussion, 4th paragraph: At the end of the paragraph, I’m not sure that the use of reference #28 appropriate for this statement. Please check this.

**AUTHOR RESPONSE**: In the original manuscript we omitted a reference. Reference 28 is now appropriate.

Discussion, 5th paragraph: At the end of the paragraph, I’m not sure that the use
of reference #29 appropriate for this statement. Please check this.  
**AUTHOR RESPONSE:** In the original manuscript we omitted a reference. Reference 29 is now appropriate.

Discussion, 6th paragraph: In the 5th sentence of this paragraph, reference #30 is use. However, #30 does not exist in the reference list I received. Please check this.  
**AUTHOR RESPONSE:** In the original manuscript we omitted a reference. Reference 30 is now appropriate.

Discussion: Do the authors have any follow-up information regarding the when and to what intensity desired activity was resumed? How many additional episodes of giving way were experienced? This would really strengthen the manuscript to show what clinical cross-over benefit may have been gleamed from this intervention. The outcome measures were clinical in nature, but because they were controlled laboratory measures, outcomes related to the patient’s function and activity would be interesting to note. Also, if enough time has elapsed, has the subject had any additional injury in the last 6 months? 12 months?  
**AUTHOR RESPONSE:** The researchers have been able to keep in contact with the athlete, who has resumed full participation in rugby union at club level. The athlete has not experience any further episodes of ankle joint giving way. Furthermore completion of the CAIT 12 months post-intervention = 29. One point was deducted from the overall score as the athlete in response to question 2 (My ankle feels UNSTABLE), responded; sometimes during sport (not every time). Thus, it can be seen that there has been a large improvement in the athlete’s self-reported ankle joint function as a consequence of the intervention programme.
Reviewer's report

Title: Effect of a 6-week dynamic neuromuscular training programme on ankle joint function: A Case report

Version: 1 Date: 16 December 2010

Reviewer number: 2

Reviewer's report:

The authors have prepared an excellent manuscript that is timely, relevant, and serves as an outstanding example for bridging the gap between clinical practice and research. There are only a couple issues I have with the manuscript that are aimed at improving the clarity of the presentation.

1. Neuromuscular training programme - It would be helpful to add a bit of information about the progressions of the program to enhance its replicability. In the table, the activities are described, but could the authors provide number of sets and repetitions, guidelines for progression, levels within each week through which the athlete progressed? Perhaps an appendix with full details of the exercises and progressions would be more appropriate. I think this information is relevant to the case report and provides readers the opportunity to incorporate it into clinical practice or design cohort studies with this as an intervention.

AUTHORS COMMENTS: Detailed information is now provided pertaining to repetitions and sets of each exercise.

2. Results - There are no effect sizes in Table 2. Only means and standard deviations are presented, which is completely fine. One recommendation for the results section is to change the term "significant" to "meaningful". Right now, the term significant is a bit misleading as it is traditionally associated with statistical findings. I understand what the authors are indicating, but for clarity, "meaningful" might be a more appropriate word.

AUTHOR COMMENTS: We have changed this accordingly.

3. Results and discussion - the authors present a logical argument for the changes in the measures due to the intervention. One of the points that could be added to the discussion that might help add context to the findings is the critical value of the CAIT that has been used to classify those with CAI. Not only did the authors find a 23 point increase in the CAIT after intervention, the score was at the threshold for qualifying for CAI. It would appear that the athlete might be on the cusp of not being classified as CAI. This may lend more weight to the findings of the objective measures used.

AUTHOR REPORT: We have now added the following section to the discussion. The researchers have been able to keep in contact with the athlete, who has resumed full participation in rugby union at club level. The athlete has not experience any further episodes of ankle joint giving way. Furthermore completion of the CAIT 12 months post-
intervention = 29. One point was deducted from the overall score as the athlete in response to question 2 (My ankle feels UNSTABLE), responded; sometimes during sport (not every time). Thus, it can be seen that there has been a large improvement in the athlete’s self-reported ankle joint function as a consequence of the intervention programme.