Reviewer's report

Title: Reliability and discriminant validity of cervicothoracic impairment measures in individuals with and without chronic neck pain

Version: 1 Date: 10 July 2012

Reviewer: Niamh Moloney

Reviewer's report:

The study from Shahidi et al. investigated reliability and discriminant validity of cervicothoracic impairment measures in individuals with and without chronic neck pain. Overall, the authors are to be commended for writing a very coherent and well written manuscript. This topic will contribute to this area of musculoskeletal assessment and would be of interest to the readers of BMC Musculoskeletal Disorders. The question posed by the authors is well defined and the authors have rationalised the need for another reliability study relating to measurement of cervicothoracic impairment. The literature in this area is well described.

Major Compulsory Revisions

Background
1. Please outline whether hand held dynamometry is a robust tool?

Methods
The methods are appropriate and reasonably well described. I would like the following areas addressed:

2. Paragraph3-Procedures: Blinding
The authors outline that raters were not blinded to the clinical status of the participants. However,
a. Were raters blinded to their previous findings?
b. Were raters blinded to the other rater’s findings?
c. Were raters blinded to other clinical information or cues that were not part of the test?

3. Paragraph3-Procedures: Randomisation
The authors outline that the therapist order was randomised (Line 3). Was the order of testing randomised?

4. Paragraph 5: Why was only one trial of cervical muscle strength taken when three trials were taken for scapulothoracic strength?

5. Paragraph 5, Line 12: Is there a reference for the method of stabilisation utilised during side bending?
6. Paragraph 6: Explain why only one test for endurance was taken.

7. Paragraph 6, Line 5: How was the maintenance of upper cervical flexion assessed. I note the authors refer to a change in chin position; please clarify how this was assessed and whether it was measured.

8. Paragraph 8: How many measures of muscle length were taken and why?

Analysis and Results

9. Were data normally distributed?

10. In the planned analysis, you calculated means and SD. Can you present these data somewhere in the results? I see the means and SE are present in the graphs but it would be valuable for the reader to have the means (SD) listed in the manuscript for clarity.

11. Results, Paragraph 1 and 2: In the data analysis, planned calculations ICC (95%CI) are described but later the ICC (SD) is presented in Results, Paragraph 1 and ICC (95% CI) in Results, Paragraph 2. Please amend.

12. Were MDCs calculated for intra-rater reliability? It would be helpful to present intra-rater reliability results in a table similar to the presentation of inter-rater reliability results.

Discussion

13. Paragraph 2, Lines 1: I suggest deleting the first half of this sentence as it undersells your results and you have already acknowledged that some of the measures had poor agreement in paragraph 1.

14. Paragraph 2,

a. Lines 4-6: Re-phrase the sentence starting “Similar to our results...” so that it is clearer that the MDC values ranging from 10-19 degrees refers to results from previous studies.

b. Line 5: sentence starting “Together these findings”: I think this could be mis-interpreted as meaning a change #10 degrees in any direction would be clinically significant when in fact your results show MDCs ranging from 9-21 degrees depending on the direction. Please address this sentence so that it more accurately reflects your data.

15. Paragraph 2, Line 12: What is different/better about your study versus previous studies in terms of methodology? Clarify what you mean about it having ‘well-defined methodology’, particularly observing queries relating to blinding and randomisation in the methods section above.

16. Paragraph 3, last sentence; why would reliability of neck endurance be poorer in healthy controls? Why would ‘a ceiling effect of the endurance test’
have affected this?

17. Paragraph 6, Lines 14-15: Explanation of the mechanism underlying impaired muscle performance in patients with chronic neck pain: While I don’t think this is a key issue of this paper (and therefore, could be omitted), I do think there are better explanations for impaired muscle performance in people with chronic neck pain than “exact mechanisms have not been determined” e.g. pain inhibition, morphological changes such as fatty infiltration and changes in muscle fibre type. If it is deemed important to include this explanation, the authors should expand on this briefly so that it is more reflective of recent research relating to changes in muscle function in chronic neck pain.

18. Paragraph 8: Limitations:
   a. Please acknowledge that the population tested were quite young and so data and particularly MDCs may not necessarily be applicable to other populations e.g. an older population.
   b. Please acknowledge lack of blinding (see methods for specific details) and randomisation of test order if that was the case.
   c. Third paragraph: I would delete this as a limitation and maybe include as a possibility for future research, if you want to mention it. You answered your research question and this wasn’t part of it.

Discretionary revisions
1. Preferably use the term participants rather than subjects
2. Abstract: Methods, Line 4: Include the word ‘respectively’ at the end of the sentence.
3. Abstract: Results, Line 1. Use full explanation of ICC
4. Place reference numbers outside commas and full stops.
5. Discussion: sentence 3: insert ‘on’ after the word based.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

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

Declaration of competing interests:
No competing interests