Reviewer's report

Title: Muscle activity and head kinematics in subjects with chronic neck pain; cervical motor dysfunction or simply low exertion motor output?

Version: 1 Date: 4 April 2013

Reviewer: Niamh Moloney

Reviewer's report:

General Comments

1. This is an interesting paper which provides deeper insights into the mechanisms of motor control alterations in whiplash associated disorder. Given the current focus on assessment and treatment of specific motor control (deep neck flexors and extensors) in clinical practice and research circles, the research presented in this paper is important and clinically relevant.

2. The manuscript would benefit from being shorter and more concise, particularly the methods, results and discussion sections.

3. Replace the word ‘subjects’ to people when referring to a population generally and participants when referring to specific study participants. This needs to be corrected throughout the manuscript.

Major Compulsory Revisions

Methods:

1. Provide an overview of the methods employed and briefly explain why they are being used. This would be most useful after the section on participants.

2. Head movements: explain how you calculated the individual neutral head position.

3. Shorten sections on kinematics and EMG is possible (particularly EMG).

Statistics

1. Re-phrase the first sentence.

2. How did you assess for normal distribution of the data?

3. Delete sentence about tendencies, particularly considering the small sample size in your study.

4. Place any information regarding statistical analyses in this section i.e. last paragraph on results of EMG about re-analyses should be described in statistics.

5. Insert information on sample size calculation/ power of the study.

Results

1. Were data normally distributed? Was normalisation possible after log-transformation of all data? Were there any data for which non-parametric
statistics would have been more appropriate? This seems likely given the nature of the data and the small sample size.
2. P-values need to be inserted throughout.

Minor Compulsory Revisions

General:
1. Watch spacing with measurements e.g. 6 cm should be 6cm.
2. There are several grammatical and typographical errors throughout the manuscript which need correction.

Abstract
1. Explain rmsEMG.
2. Conclusion is very unclear. ‘Unconstrained head movements in subjects with WAD are completed with reduced velocity etc does not make sense, perhaps due to incorrect use of the word ‘completed’.

Background
1. Sentences 3 and 4 of 1st paragraph need referencing.
2. Second paragraph and start of 3rd paragraph- excessive use of furthermore, additionally, in addition.
3. Re-phrase last sentence ‘comparisons were completed’; do you mean comparisons were conducted?

Methods
1. First and fourth sentences could be combined and shortened. Suggestion: We examined……suffering from long term WAD (>6 months), classified as grade 2 on the Quebec Task Force classification and which started within 72 hours of the motor vehicle accident.
2. Why were height, weight, BMI and grip strength measured? Explain.
3. Self-reported questionnaires: pain rating usually starts at 0 not 1.
4. Self-reported questionnaires: Re-phrase last sentence.
5. It is stated that all tests were supervised by two examiners. Do you mean that all tests were conducted by two examiners at the same time? Why was this necessary?
6. GLM is commonly referred to as ANOVA. Use ANOVA and ANCOVA as appropriate.
7. Re-phrase second last sentence.
8. EMG:
   a. 1st sentence: ‘sampled from 3 pairs of muscles’ but only 2 listed.
   b. Change ‘in the following, the SCM will be referred to” to ‘from now on / henceforth etc’.
Results
1. Re-phrase the sentence ‘the control group scored about the same as the Norwegian normative values’. If they were compared, provide details of results and results of this comparison.
2. Kinematics: ‘All variables for head and neck kinematics showed differences’ - were these differences statistically different?
3. Delete references to tendencies.
4. Association between kinematics and self-reported data: re-phrase last sentence Suggestion: We did not find any....
5. EMG: delete ‘as expected’ from second paragraph.

Discussion
1. The small sample size should be acknowledged as a limitation and care should be taken making strong statements such as ‘these findings indicate that long term WAD neither leads to altered activation strategies nor resultant movement patterns etc’ in such a small study.
2. It would be good to discuss the clinical implications of these findings.

Conclusion:
1. Second sentence contains a double negative and therefore is not clear. Again, it would be appropriate to mention the clinical relevance of this study at this point.

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

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

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
I declare no competing interests.