Reviewer’s report

Title: Evidence for a general stiffening motor control pattern in neck pain: A cross sectional study.

Version: 1 Date: 26 November 2014

Reviewer: Deborah Falla

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Evidence for a general stiffening motor control pattern in neck pain: A cross sectional study

Major Compulsory Revisions

This manuscript presents the results of a comprehensive assessment of neck movement and motor control in people with non-specific neck pain versus healthy subjects. A strength of this study is that it evaluated different constructs of cervical motor control in contrast to previous studies which have typically evaluated one aspect of motor function. However, there are some limitations which should be acknowledged.

Firstly, an important limitation is the lack of clinical data for the patient group. Considering the association between movement features and psychological characteristics in people with chronic pain, it seems odd that other features such as fear of movement, anxiety, catastrophizing etc. were not measured. If this data is available it is strongly recommended that the data is added to the current manuscript as this would strengthen this work.

What was the general health status of the subjects, the levels of physical activity, occupation….please provide as much information as possible to better describe the people included in this work.

The conclusions reached in the current study have been largely reached before, albeit across a number of single studies. Additional analyses evaluating the relation between the various constructs of cervical motor control and clinical features would be relevant to include and would strengthen the current paper. Although only the duration of pain, NDI score and NRS of pain intensity are presented, it would be interesting and relevant to evaluate the associations between these clinical parameters and motor task performance, especially since the current study includes a relatively large sample size compared to several previous studies.

The conclusion that “rigidity is a local neck response and not a general response to pain” is not justified from the current data. The only measure performed that was not local to the neck was postural sway thus I believe that this conclusion is extrapolating a bit too far.
Please provide further information about the qualifications of the therapists performing the measures. The fact that one therapist performed the measures on the healthy controls and another tested the patients clearly may introduce bias, as acknowledged by the authors. Were the therapists at least somewhat equivalent in terms of their qualifications/experience?

Minor Essential Revisions

Present the p values when reporting results.

Page 9- define NRS

What was the rationale for including subjects with neck pain with a score of 3 or more on a NRS at the day of testing? Provide a reference if appropriate.

How many people were excluded when they appeared at the laboratory for testing with a pain score less than 3 on that particular day?

Were the tests performed in a random order or in the order presented?

Peak velocity is listed as a measure of flexibility. Please further explain how velocity reflects neck flexibility.

Please indicate why only joint position error following neck rotation was measured. Why not neck extension for example?

For the proprioception tests, did the examiner reposition the subjects head back to neutral between each repetition? Please clearly state whether or not this was done.

For the description of the tracking tasks (page 9), please specifically indicate the tracking velocities that were used.

Please indicate and explain why the patients with neck pain were offered two test sessions for the trajectory movement control tests and the healthy controls only one.

How was task failure defined for the task of isometric neck flexion? How was the position of the head controlled by the investigator – visual inspection only?

Statistical analysis – “those who did not perform the test correctly or were exposed to technical problems were dropped from the analyses.” Please provide a clear indication of how many cases were lost for each of the tests in each subject group.

Discussion – some of the results in the current study are in contrast to previous observations e.g. the trajectory movement control using the Fly test and the proprioception test. Although this has been stated, the authors do not provide possible explanations. Please discuss possible differences between studies which may explain this discrepancy e.g. different severity of neck pain, idiopathic
neck pain versus whiplash etc.

Please introduce and explain Table 5 in the Results section and not for the first time in the conclusion.

**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