Reviewer's report

Title: Are cervical multifidus muscles active during whiplash and startle? An initial experimental study.

Version: 1  Date: 28 December 2007

Reviewer: Jim Dickey

Reviewer's report:

Major compulsory Revisions:
1) you state that it is unclear whether the multifidus muscles activate reflexively during a whiplash response (near the bottom of page 3, and middle of page 4) yet previous work from your group (reference #33 in your manuscript) describes reflex activation of the multifidus muscle group during whiplash-like perturbations. It would be helpful for you to provide additional information from this manuscript to set the stage for the current manuscript. For example, one of the subjects in the current study did not exhibit multifidus muscle activity following both stimuli, and there were variable responses in the previous study; one subject showed activity in the multifidus muscles during the initial retraction/extension, one showed activity during the rebound, and one showed neither. The similar pattern of response would be helpful to indicate that the single subject in the current study may reflect a group of individuals who do not respond rather than merely an atypical individual subject.

2) You tested with the auditory stimulus first, and the whiplash-like perturbation second, for all subjects. Accordingly, there is a confounding order effect in your experiment. You need to acknowledge this limitation and describe how it may have affected your results. For example, you observe no statistically significant difference in muscle response amplitude between the auditory and acceleration stimuli; would this finding be the same if you had randomized the order of presentation of the stimuli across subjects?

Minor Essential Revisions
3) you describe using a nine accelerometer array to measure head accelerations. You have referred to this system as individual accelerometers in previous research papers (Siegmund GP, Sanderson DJ, Myers BS, Inglis JT. Awareness affects the response of human subjects exposed to a single whiplash-like perturbation. Spine. 2003;28:671-79). Please clarify whether it is an array or whether it is nine accelerometers arranged as an array.

Discretionary Revisions
4) You state that the EMG from superficial muscles "grades positively" with both sled acceleration and velocity change (middle of page 11). This wording is somewhat awkward and could be clarified.
5) You start a sentence with "Or short, reflex muscle activations..." (middle of page 9). This sentence fragment need to be corrected.

**What next?**: Accept after minor essential revisions

**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**: I declare that I have no competing interests