Reviewer's report

Title: Leg orientation as an indicator of perceived body orientation in stroke patients

Version: Date: 27 April 2006

Reviewer: Ann Ashburn

Reviewer's report:

General

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

Thank you for asking me to review this paper which addresses a complex under researched topic. The thrust of the paper is interesting but in its current form the text is difficult to read, partly due to the use of terminology not clearly defined and partly due to procedural steps that have not been clearly justified. The authors state their aim was to investigate ‘pusher’ patients’ spontaneous postural responses of the non-paretic leg and the head during passive body tilt.

The quality of the work in this paper depends on the following: the sample definition, the validity of the intervention and methods of measurement and the appropriateness of the analysis and interpretation. I have concerns in all three areas.

Sample: If the explanation or description of a ‘pusher’ is to be robust, the diagnostic process has to be as transparent as that adopted for the subjects in the study with unilateral vestibular loss. For pushers, the authors used a gross scale (0-2) which has been used previously for rating the behaviour (I believe 1 = evidence of pushing in sitting and 2 = evidence in standing); more information is need in the current paper of how the diagnostic decisions were made, who made the diagnosis and at what time post-stroke. From my research and clinical experience in this field there is considerable debate between assessors over who meet the criteria; ideally more than one assessor should independently rate subjects. In addition those people with stroke who did not present with ‘pushing’ should be of equal stroke severity as those who did.

Validity of Methods: The authors state that the subjects were asked to sit on a bed and look straight ahead while the experimenter applied a smooth slow sideways movement. We were told subjects were asked not to resist. In my experience ‘pushers’ cannot stop themselves from resisting with their arms, legs and trunk, so I think it is highly unlikely that the experimenter could give the same tilting motion to all subjects which means the conditions are likely to have varied. In fact by looking at the pictures it is clear that the experimenter placed her hands in different ways on the subjects which would inevitably provide a different whole-body tilt motion. The other point noticeable from the pictures was that the ‘pusher’ was not looking straight ahead as defined in the procedure (probably because of unilateral neglect) which may have invalidate the head position angle.

The authors used a laborious method for movement analysis and although this produced the required data it would also have generated a considerable amount of work. For that reason and because there was no mention of it in the paper I wondered if the researchers tested the reliability of marker placement and data extraction.

Analysis: The authors have made reference to angles in relation to the earth vertical and angles in relation to the trunk a greater explanation of the angles adopted for analysis and why they were adopted is required. I think the reference to gain and to velocity on page 6 add to the confusion over which parameter is the most important in the explanation of the movement behaviour. Gain of the head and leg with respect to trunk were computed from maximum velocity but the maximum velocity rates may not occur at the same time. The reasons for using velocity need to be justified.

I do not think the photographs clarify the experiment but as the authors chose to include them they should have presented photographs from all four groups. From my experience the ‘Pusher’ in the photograph is fixing not ‘pushing’ and the non-pusher stroke is hypotonic and flail illustrating the complexity of balance problems among people with stroke and if anything adding to the confusion rather than clarifying the situation.
Although I have been very critical of some of the procedures used in this research I believe the authors have explored a very difficult area of study. I would concur that the motor/sensory problems are highly likely to result from damage at a higher level of interpretation but the data as it is presented in this paper does not appear to be robust. I think the problems faced by the researchers and the limitations of the study are as important as the data produced and the researchers should be encouraged to describe the difficulties they faced.

I can not recommend that this paper is published in its current form. I think more information is required about the sample characteristics, the methods of measurement and analysis plus the study limitations. I would remove the photographs and figure 4.

I hope my comments have been helpful.

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

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Discretionary Revisions (which the author can choose to ignore)

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What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

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

Declaration of competing interests:

I declare that I have no competing interests.