Reviewer's report

Title: Development of spasticity with age in a total population of children with cerebral palsy

Version: 2 Date: 24 July 2008

Reviewer: Kerr Graham

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Re: Development of spasticity with age in a total population of children with cerebral palsy. Gunnar Hagglund and Philippe Wagner

1. Is the question posed by the authors well defined?
The question posed by the authors is well defined and of considerable clinical significance. I agree with the author's assertion that longitudinal changes in measures of spasticity have not been studied in children with cerebral palsy.

2. Are the methods appropriate and well described?
The crux of this study is whether clinical measures of spasticity using the Modified Ashworth Scale (MAS), presumably by multiple clinicians of variable experience and training, over long time intervals, can be used as a valid and reliable measure of spasticity in children with cerebral palsy. The literature contains much conflicting information in relation to both the validity and reliability of the MAS which I do not believe has been completely resolved. For example in May 2003, Pandyan et al in a paper entitled “A biomechanical investigation into the validity of the modified Ashworth Scale as a measure of elbow spasticity” concluded that “the MAS does not provide a valid measure of spasticity at lower grades but it may provide a measure of resistance to passive movement”. Given that the entire study is based on the MAS, a discussion as to the disputed validity of the MAS and some indication as to its reliability by the clinicians would be important. In addition as an orthopaedic surgeon I am aware of the controversy surrounding the MAS but do not feel qualified to judge the current standing of the MAS and its use in this research setting. I am completely comfortable with the MAS as a clinical measure of spasticity as used in the Swedish CPUP program. I am not so convinced that it can be used as the primary outcome in a research setting, as in this study. I think it would be most important to have the opinion of a physiotherapist with an extensive research background or a specialist in rehabilitation medicine to comment on this point.

3. Are the data sound?
The data in this study are derived from an extensive data base, serial longitudinal measurements of gastrocsoleus tone using the MAS. The soundness of the data depends on both the validity and reliability of the MAS and the training of those who have made the measurements. The number of observers, their training and the measure of their inter- and intra-rater reliability has not been given and
probably should be required before the publication of this paper can be considered.

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
   Yes

5. Are the discussion and conclusions well balanced and adequately supported by the data?
   Yes

6. Are limitations of the work clearly stated?
   A more comprehensive discussion on the limitations of the MAS would be helpful, particularly highlighting concerns regarding both MAS validity and reliability. In addition other measures such as the Modified Tardieu Scale have not been discussed and might well have been more value in a research setting.

7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?
   Yes

8. Do the title and abstract accurately convey what has been found?
   Yes

9. Is the writing acceptable?
   Yes although there are some typographical errors e.g. “intratekal baklofen pump” for “intrathecal baclofen pump”

Additional questions to the authors:

1. Can they explain the reason for dichotomizing the Ashworth Scale?
2. Were efforts made in the primary data collection to distinguish between spasticity in the gastrocsoleus and muscle contracture? If so how were the differences recorded?
3. How many “local physiotherapists” were involved in data collection? What was their training and what is known about the inter- and intra-reliability of their measurements?
4. Fifty-one patients are listed as having had a “tendo Achilles lengthening”. Were any other forms of gastrocsoleus lengthening or recessions performed?

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

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.
Declaration of competing interests:

none