Author's response to reviews

Title: Use of manual and powered wheelchair in children with cerebral palsy: a cross-sectional study

Authors:

Elisabet Rodby-Bousquet (elisabet.rodby_bousquet@med.lu.se)
Gunnar Hägglund (gunnar.hagglund@med.lu.se)

Version: 4 Date: 6 July 2010

Author's response to reviews: see over
Dear Editor,

We appreciate the thorough review of our paper. The manuscript has been revised according to your suggestions, and we have done a copyediting of the language. Our response to each concern is written point by point below.

Best regards

Elisabet Rodby-Bousquet

Reviewer’s report

Title: Use of manual and powered wheelchair in children with cerebral palsy: a population-based study
Version: 3 Date: 25 May 2010
Reviewer: Jan Willem Gorter

Reviewer’s report:

I have read the manuscript with interest. It is a nice descriptive report (no hypothesis, basic statistics) of children and youth with CP using different types of wheelchair to move around, indoors and outdoors. The findings are confirmative with the literature on the Gross Motor Function Classification System and the work done by Palisano et al. on mobility.

I do like the important and relevant message of the authors that wheelchairs for young children with CP can "liberate" them instead of being confined to a wheelchair.

I think that the paper can be improved by the following suggestions.

1. Is the question posed by the authors well defined?
   The research question has been clarified by adding the purpose at the end of the Introduction according to your suggestions. This is a descriptive study so we excluded the word predict and altered the sentence regarding “predicting future ability in the individual child” to “facilitate an early independent mobility for the individual child”.

2. Are the methods appropriate and well described?
   The method is a cross-sectional design. This could be stated more clearly and
the description of the programme CPUP in which the child is examined 1-2 times per year is misleading (see abstract, methods section). The analyses is very basis with descriptives (frequencies) and limited correlations (GMFCS level). The authors could have posed hypothesis based on the literature by Palisano et al.

Comments
The design has been added to the title. The design has also been emphasized more clearly in the Abstract and in Material and Methods. The methods section of the abstract has been altered in order to clarify the design and minimize the risk of misleading the reader. The sentence “the child is examined 1-2 times per year” has been removed.

3. Are the data sound?
Yes. The data are collected as part of a programme CPUP with the use of reliable and valid classification system (GMFCS, SCPE). The variable mobility probably is a simple question yes/no in the programme. The authors could make this more clear. It would be nice to get some more detailed information on the (other) mobility devices and wheelchair the children use, and their experiences if the authors have access to these data.
I do not see why all Figures are needed, as the data are mostly summarized in the Tables already.

Comments
We have explained the questions in more detail (Materials and methods para 2). There is no further information regarding type of wheelchair or wheelchair adaptations in the programme. We have now pointed that out as a limitation (Discussion para 4).
The number of Figures has been reduced from 8 to 2. The wheelchair use related to age, presented in Figures 5-8, has now been summarised in Table 3.

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?
The discussion section addresses nicely the findings (the use of wheelchair in a total population of children with CP, showing the degree of independent wheelchair mobility and the use of adult assistance for mobility). Again, it does not address the prediction of wheelchair use. The authors could discuss the cross-sectional design more clearly. The data is well interpreted and the literature is well referenced.

Comments
Thank you. We have excluded the text regarding prediction of wheelchair use, and we have clarified that it is a cross sectional study describing the use of wheelchair in a total population of children with CP, see comments above (point 2).

6. Are limitations of the work clearly stated?
No, this part is missing in the discussion section

**Comments**
We have now added the limitations in the Discussion, para 4.

7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?
Yes, the relevant literature is used. I would suggest to replace reference # 1 by the most recent consensus definition of CP published by Rosenbaum et al. The authors could also look at Holsbeeke et al. 2009 when they discuss the issue of capability and performance.

**Comments**
We have replaced reference 1 by the definition of Rosenbaum et al, and included the paper by Holsbeeke et al 2009 in the Introduction (para 3) and Discussion (para 2).

8. Do the title and abstract accurately convey what has been found?
Yes. In line one of the Methods there is a typo: were should be was.

**Comments**
The sentence has been corrected. The title and abstract were changed in order to clarify the study design.

9. Is the writing acceptable?
Yes. In line one of the Methods (abstract) there is a typo: were should be was.

**Comments**
Correction done

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

**Quality of written English:** Acceptable

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

**Declaration of competing interests:**
'I declare that I have no competing interests
Reviewer’s report
Title: Use of manual and powered wheelchair in children with cerebral palsy: a population-based study
Version: 3 Date: 11 June 2010
Reviewer: Marjolijn Ketelaar

Reviewer’s report:
This manuscript contains a lot of interesting information on wheelchair use in children with cerebral palsy. However, the manuscript in its present form lacks a clear research question, and therefore the direction and the message get lost.

Major Compulsory Revisions
- Please define your research question clear and to-the-point. In the results and figures you present much detail on various ages and various GMFCS levels. There is an overflow of information. Please make clear what is the focus of the manuscript. Since in the present form all ages and all GMFCS-level have been described, the reader gets lost in all information. Please make clear what is of most interest. For example, you could focus on wheelchair use in children with GMFCS level III and IV and focus on differences between indoor and outdoor use in these groups. This could provide very interesting information. Or you could focus in more detail on wheelchair use in children GMFCS level II (a group that is not “expected” to use wheelchairs very often). What is the relation with age of wheelchair use in this subgroup?

Comments
The research question has been clarified by adding the purpose at the end of the Introduction. We have changed the title, describing that it is a cross sectional study and also tried to clarify that it’s the performance and not capability we describe (ref Holbeeke et al 2009)

The information in the Result section has been reduced especially the results related to age, according to your suggestions. The number of Figures has been reduced from 8 to 2. The wheelchair use related to age, presented in Figures 5-8 have now been summarised in Table 3. Our main focus is the low number of children who self-propels their manual wheelchair (only 14% outdoors).

- Page 5: Statistical analysis are difficult to follow because there is no relation to the research question. GMFCS is an ordinal scale. What was the analysis you did on the GMFCS? And please make clear what you mean with “subtypes”.

Comments
The Linear by linear association test was used to analyse trends in wheelchair use related to GMFCS-levels, and Spearman’s rank correlation to calculate correlations. The GMFCS was analysed as an ordinal scale.
To make the statistical analysis easier to follow, information about the statistical methods and the analysis were added into the legends for Table 3 and the Figures 1-2. The CP-subtypes are defined according to SCPE in para 3 in the Materials and Methods. We have replaced the word “subtypes” by “CP subtypes” in the text.

- The comparison across ages is difficult because this is not a longitudinal study. In different age groups the distribution of GMFCS-levels is not the same (e.g. age 15 – relative low motor function – high percentage of children GMFCS levels IV and V). This means that you should be very careful in your conclusions with
The children were divided into five age groups according to the Swedish school-system. Pearson Chi square test showed no significant differences in GMFCS level between the age-groups.

- If the research question is more focused, the discussion-session could become more focused as well. What can we learn from these results? And what are the limitations? Etc.

**Comments**

We have clarified the research question as described above and added a paragraph regarding the limitations (Discussion para 4).

Minor revisions

- Page 1: I would strongly advice to use the consensus definition of cerebral palsy as described by Rosenbaum et al (Developmental Medicine and Child Neurology, 2007).

**Comments**

We have replaced reference 1 by the definition you suggested.

- Page 4: I suppose the question on wheelchair use in fact were 4 different questions? (1) use manual indoors, (2) use manual outdoors, (3) use battery-powered indoors, and (4) use battery-powered outdoors.

**Comments**

Yes, we agree and have made an attempt to clarify this, see Materials and Methods para 2.

- Reference list needs some attention – in some references names are missing.

**Comments**

For the reference list we used EndNote with the style chosen by BMC Pediatrics. We also performed a hand search through all references and the articles and cannot find any missing names in the reference list. Please let me know which references you refer to.

**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
This paper describes the use of manual and powered wheelchair use in a large population of children and adolescents with CP. In addition, the level of independence in using the wheelchair is described. Although the topic of this paper is a relevant and important issue to consider in CP treatment and data are collected in an impressive number of subjects, the information that is presented in this paper is in my opinion not suitable for publication.

First, data are limited to a description of type and mode of wheelchair use and lack an association with an indept measure of independence in mobility or participation. The description of the answers to the two questions that were used in this study (whether participants use a manual or powered wheelchair and whether they propel the wheelchair independently) are insufficient to support the conclusion of the study that manual and powered wheelchairs should be considered at an early age for all children with impaired walking ability. It remains unclear to what extend the answer to these questions reflects the actual performance in daily life. Consequently, the main conclusion and suggestions that are made throughout the paper about the influence of powered (independent) mobility seems rather based on theoretical considerations than on the results presented in this study.

Comments

The study reflects their performance, and this has been clarified in the introduction (para 3) and the Material and Methods section. We realise that the description of the questions and answers were insufficient and this has now been clarified (Materials and Methods para 2).

The conclusion is based on our results showing that a majority of the children use a manual wheelchair but only 14% of those using a manual wheelchair outdoors self-propel independently while 86% are pushed by an adult. As mentioned in the Introduction, para 2, independent mobility is vital for participation. We found that of the children with the dystonic type of CP using a manual wheelchair only 2% self propelled indoors and none outdoors. These results lead to our conclusion that most children with dystonic CP need a powered wheelchair to achieve an independent wheeled mobility and that both manual and powered wheelchairs should be considered at an early age for all children with impaired walking ability to achieve a high degree of independent mobility. Unless we do so, a majority are likely to be "confined to a wheelchair" and depend on others for mobility. Since there are some disadvantages with powered wheelchair compared to manual wheelchair (Discussion para 6), it is most unlikely that a child would use a powered wheelchair instead of a manual if it wasn’t needed to increase the performance and independence.

Second, results are not adequately presented. A lot of descriptive information is presented in the text and figures. Wheelchair use and independence are related to different patient characteristics separately. This raises the question why the authors did not perform a multivariate analyses. Results of the statistics are
limited to p-values and it is not clear which test was used for which variables. Furthermore, the numbers that are described in the test do no correspond to the numbers presented in Table 2 and 3. Table 2 and 3 present a combination of powered (horizontally presented) and manual (vertically presented) wheelchair information, which is not clear from the current presentation.

**Comments**

The statistical methods used to analyse outcome measures related to age, GMFCS and CP subtype are described in Material and Methods. To make the statistical analysis easier to follow, information about the statistical methods was added into the legends for Table 3 and the Figures 1-2. We agree that there was an excess of information. We have reduced the information in the Result section, and we have reduced the number of Figures from 8 to 2. Figure 5-8 has been replaced by Table 3. We also revised the format for the Crosstabs presented in Table 2 and 4 (previously numbered as Table 2-3). The numbers of Table 2 and 3 (now referred to as 2 and 4) are correct. The text has been revised accordingly.

We tried to clarify that this is a cross sectional study, by adding the design to the Title and into the Material and Methods section. We also added the purpose at the end of the Introduction. This is a descriptive study so we have excluded the sentence regarding “predicting future ability in the individual child”. If the purpose had been to do a prognostic study, we agree that a multivariate analysis should have been adequate.

**Level of interest:** An article of limited interest

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

**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