Reviewer’s report

Title: Intramuscular fat in ambulant young adults with bilateral spastic cerebral palsy

Version: 2  Date: 9 January 2014

Reviewer: Mark Peterson

Reviewer’s report:

General Comments:
The purpose of this investigation was to compare the amount of intramuscular fat between adults with bilateral spastic cerebral palsy (BSCP) and typically developing adult controls. Much recent attention has been given to the role of myosteatosis as a predictor of negative health outcomes/risks such as insulin resistance, diabetes, and cardiovascular disease, as well as muscle dysfunction. However, and although there have been numerous studies published which have examined intramyocellular lipid (IMCL) content across various at-risk populations, no specific research has been conducted to compare fatty infiltration in the spastic muscle of adults with CP. Such research would certainly help the medical rehabilitation community better understand mechanisms of secondary muscle pathology, and provide clues regarding early risk for metabolic disease in this population. Therefore, and despite the fact that this study cannot explain differences in fat content due to any potential mediating factors, I believe that this paper has merit as preliminary evidence. I have included specific comments, questions, and requests for clarifications, as may be seen below. I would like to thank the authors for the time and effort that went in to this important project.

Specific Comments:

1. Abstract-Background: It is important to better establish the rationale for the study with some brief background. Why is the study of intramuscular fat in CP important?

2. Abstract-Background: There is a word missing in the sentence starting with “The objective of this study…” I think it should say “adults with CP” not “adults with have”.

3. Abstract-Results: How was IntraMF “related to GMFCS”? Assuming you mean there is greater percentage of intramuscular fat among GMFCS IIs and IIIIs, compared to IIs? Since GMFCS is not a continuous variable, it’s not appropriate to perform pearson correlation with that as an independent variable. If, on the other hand, you found differences with an ANOVA, just state that there was significantly greater IntraMF among GMFCS III compared to IIs and IIs.

4. Abstract-Discussion: While I completely agree with this, you really can’t make any comment regarding exercise based on this study and these findings. However, you can mention that this is an important finding that might contribute
to cardiometabolic and functional comorbidities in this population.

5. Background-General: This is a very nice introduction and rationale.

6. Background-Page 3, Paragraph 2: It would be appropriate here to draw-upon the literature that links sedentary behavior to increased IMAT. The paper by Manini et al. is a good example of the negative implications of chronic inactivity.1

7. Methods-Participants. How were typically developing controls chosen? Were they matched on age and gender? Ideally, it would be appropriate to also match on BMI, as this is a known predictors of inter/intramuscular fat; however, this would be difficult as many adults with CP are frail. Please add some commentary on this.

8. Methods-Data collection. Since MR data is not the only data collected, you need to provide a description of the methods for anthropometric and GMFCS data collection procedures.

9. Methods-Data Analysis. This should only include statistical analysis in this section. Please move the description of MR data processing to a separate section that includes both MR data collection and processing.

10. Results: Paragraph 2. Please provide the coefficient when discussing results from pearson correlation.

11. Results: Paragraph 3. Again, not sure how “IntraMF fat was significantly related to GMFCS”. Assuming you didn’t run correlation on this. Also, were you able to actually test for differences? Due to the very small number of subjects in each GMFCS category, I would think this would be difficult. Regardless, and although it’s not necessarily incorrect to say “related,” perhaps the best choice is just to state that “Post-hoc analysis revealed significant differences in intramuscular fat for levels of GMFCS, such that…”

12. Results: General. Is it possible to provide MR images to illustrate the differences in fat distribution between two representative subjects (i.e., 1 CP subject and 1 matched TD subject)?

13. Discussion-General: Overall, this is a very nice, lengthy discussion. It might be possible to reduce the number of redundant statements, if word count is an issue. Also please check to make sure abbreviations are populated (e.g., you abbreviated IMCL twice). As previously mentioned, my suggestion is to also refrain from saying that intramuscular fat is related to GMFCS. Rather, you could say that “these findings suggest that intramuscular fat is associated with degree of mobility impairment.” This is probably due to increased SB and less PA in more affected individuals, but could also be due to greater whole body adiposity relative to lean mass. Interesting about the fat content being higher in muscles with previous surgery. You might briefly (one sentence) discuss the literature pertaining to muscle injury and fatty degeneration (e.g., Medias et al.2)

14. Discussion: Page 13: The sentence starting with “Further to the variability…”
needs to be reworked. As stated it is unclear.

References


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