In this project the authors have investigated the volume of 9 lower limb muscles in 50 individuals with and without CP, 10-23 years old, through measurements obtained by measuring MR scans from the legs. Volumes obtained were then plotted against the body weight of the individuals at one time point. Graphs were constructed that displayed that with increasing body weight individuals with CP had a less steep increase in muscle volume as did the typically developed individuals. This is potentially a clinically important finding and data is presently lacking for these particular ages. Unfortunately though the authors haven't been able to convincingly show us the possible clinical utility of the findings nor the reliability of the method. Thus prior to this article can be published there are a set of questions and issues that needs to be addressed. Other important covariates and mediators of muscle volume needs to be addressed, these are ethnicity and pubertal development. Particularly important is the later in this study were in both groups a large majority (~75%) were male, and in the typically developed group individuals were significantly older, heavier and taller.

Background

P3, line 15; comma around reference is missing

Line 22; Full stop after 8 years is missing. Word "to" is missing after limited.

Line 24; for consistency compared to line 15 reference should be added after Day et al. OR better still add all references at end of sentences.
First paragraph two last sentences, I think this section would benefit if you could explain to the reader if and how there is a relationship between muscle volume and strength. If so this would also help supporting why this study is important.

P4, line 15; reference missing

P5, line 4.5; references missing

Please state the scientific rationale for the Study. Why did you want to do it? What was the aim?

Methods

Participants

P6, line 10; how many male?

Data collection

Why did the protocol for the MR scanning change twice during the study period?

Image analysis

P 7, line 27; please change lateralis composite to vastus lateralis. Also be consistent with Table 2 in naming muscles.

In the second paragraph of this section the authors describe a method to assess the repeatability of the imaging technique. However, it is not the imaging technique that is being evaluated but the volume assessment method.

But furthermore, the method is not clearly stated and thus it is not easy to understand in what way the repeatability or rather reliability ( interrater and intrarater) of the volume assessment method has been done. It does seem though as if composite scores and averages were used in a way that possibly can even out differences. A method were a minimum of 10% of the original muscle volume assessments ( full assessment 9/ research individual) were redone in the same manner by a second (inter rater)or the same (intra rater)assessor would be a better way of ensuing the consistency of the volume assessment method.
Statistical analysis

P 8, line 8; Please show in detail how MDC was calculated including what data that was utilized.

P 8, line 13-16; Second paragraph first sentence- this sentence should be moved to other part of methods. If a subsection named muscle volume analysis or such was created everything pertinent to the muscle volume calculations could be moved to this section. At present this is a bit scattered.

In addition this first sentence, line 13-16, seems to state some sort of composite muscle volume score? If this is correct I suggest that you clearly state this and address the score in such a way (it would be beneficial with a name). Is this utilized in figure 1 were it says muscle volume only?

Results

* I believe the Results section would benefit from some restructuring. For example, the section on muscle volume - the main results of the study- should be moved forward from page 10 to page 9 while the section starting with ICC should be moved back.

* Muscle volumes should be related to BMI rather than weight*length. Please add these data.

the first paragraph;

Ethnicity should be accounted for in table 1. and discussed in Discussion. Different ethnicities have different muscle mass at the same body weight and length. As an example Afro Americans have higher muscle mass than whites and have different (higher) cut offs for overweight and obesity.

BMI should be added to table 1

When prior treatment is described please use median and range rather than mean with two decimals.

Results second paragraph

This entire paragraph is quite difficult to follow. When MDC I stated and average muscle volumes are given it doesn't say if it is TD or CP muscles? Is it all muscles from all individuals
averaged together? Can this paragraph be switched for a table with a clear and instructive "legend"?

P 10 and all through manuscript. You might want to switch to a "People first language" writing groups with CP rather than CP groups.

Discussion

The discussion could benefit from some additional structure. An idea could be to focus more on why you think this is important information and in what way it can help patients and clinicians in decision making.

* Please remove word representative from first sentence since we cannot say with available information that either group are representative of their respective norms.

* An important mediator to muscle volume in males in particular is puberty. During puberty there will be an increase in lean skeletal muscles and reduction in body fat. This is illustrated by an increase in BMI. Thus a young man has "more muscles" to the weight than a young boy. However puberty occurs at different age and in men it is often not completely finished until 20yrs+1.

* In this study the TD was 3 years older than the group with CP and ca 75% in both groups were male, thus pubertal status can be assumed to be an important factor that cannot automatically be substituted for age (and not age only up to 17). Since this was not investigated it needs to be carefully discussed and evaluated.

* In addition ethnicity needs to be discussed ( please see my previous comments from results).

* GH (growth hormone, an important anabolic hormone)deficiency in CP has been shown in many studies . This could be potentially interesting to discuss as well.

* It seems like the biggest difference in Muscle volume vs body weight is found in the gastrocnemius muscle. Why is that? Could the individuals with CP have had BoNT-A treatment or surgery to their calfs? Is this possible for you to address and discuss?

* It does seem important to be able to evaluate muscle volume in a standardized manner-this is why the method and its reliability needs to be further described and investigated.

P 13, line 51, Should be GMFCS level III? (says 5)
P14, line 2+3, please rephrase; instead of "…related to the severity of the original injury" write "…related to the severity of the motor disability"

Study limitations

Implications of not assessing puberty needs to be assessed.

P 14 last sentence. It is likely that puberty may have influenced the results

P 15 can a supplementary table with interventions be added?

Figure 1.

* Please state on X-axis unit for body mass.
* Is it possible that explanatory description is faulty - symbols mixed up? Curves seems reversed?
* On Y axis is this a composite score of muscle volume?

Figure 2.

* Description of symbols is missing
* X- axis for lateral gastrocnemius differs from other muscles- mistake?

Table 2

* Please use the same names for muscles as in the article text.

Table 1

* Add BMI
* Add Ethnicity

Supplementary material

Instead of height mass product I suggest BMI or BMI as well. Please display Muscle volume relationship to BMI graphs.
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I recommend additional statistical review

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

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