Reviewer's report

Title: Rotational strength, range of motion, and function in people with unaffected shoulders from various stages of life

Version: 2 Date: 18 February 2009

Reviewer number: 1

Reviewer's report:

Response to responses

In general, the authors adequately responded to my initial concerns. Several concerns were not fully addressed.

MAJOR COMPULSORY REVISIONS

2. Page 7 - Why are there more female than male subjects? Why is the distribution across groups so variable?

As mentioned in the Methods, subjects were recruited for this study by a variety of methods (flyers advertising the study, people accompanying their spouses to the Hospital, and word of mouth, studies evaluating the psychometric qualities of the FIT-HaNSA and the concomitant validity of isometric strength devices). For the validation studies, the subjects recruited were mostly university students, therefore, they are more subjects in the younger category. Furthermore, as mentioned in the Discussion, older subjects were hard to recruit. For the number of male and female subjects, the goal was to recruit 100 subjects for each gender. This goal was achieved. However, other subjects volunteered to participate, therefore they were included regardless of the gender. More women volunteered, resulting with overall more female. This has been our experience in other studies as well- i.e. higher female volunteer rates.

An explanation in the discussion detailing the above information would be helpful. I continue to question the unequal gender distribution across categories. This is most apparent comparing females to males in the 18-39 year old category (112:71) versus the 60+ category (17:30). To my understanding, females have a longer age expectancy than males. The 60+ distribution appears to be opposite that of the population.

Page 7 - It is unclear why the tests sessions involved only 2 of 3 possible variables.

When this study started our focus was typical impairments measured in clinical research: strength, range of motion and self-report measures of disability (SST, DASH and WORC).

The FIT-HaNSA was not developed at that time.
Might it be more appropriate to generate 2 studies from the data the authors’ have gathered?

Page 8 - The reliability of goniometry is not high. There are much better tools available.

We wanted to use clinical tools since this article was performed to give normative data to the clinicians. Goniometer is the most widely used instrument to measure ROM in clinics. That is why we decided to use this tool. Reliability is high when standardized methods are used and so we added...

The clinical tools rationale should be included in the introduction to the manuscript. The SEM cited was related to scapulothoracic not glenohumeral motion in the referenced article.

Page 10 - The data analysis is unclear. Multiple steps are necessary to correct this:

a. Did the data meet the assumptions for parametric statistics? For example, there is no evidence of visual or statistical testing of normality.

The majority of the skewness and normality tests indicated normality was present. Some of the self-report data was skewed to low scores as we discuss, but not sufficiently to warrant non-parametrics.

This information should be added to the methods and results.

Page 11 - How accurate is the LIDO? Can the authors demonstrate that the 1.0 or 2.2 Nm differences they cite between sides are true differences?

The differences are “true” within the limits of statistical analysis parameters, but may not indicate clinically important differences in capability from side-to-side. The absolute measurement error of the LIDO is unknown for the evaluation of shoulder movement and thus group and individual level “clinically important differences” are not known.

How accurate was the LIDO under the conditions it was used by the authors?

MINOR ESSENTIAL REVISIONS

Page 8 - It is unclear why the authors only tested the strength and ROM of the internal and external rotators.

We decided to focus on muscles of internal rotation and of external rotation since they are the muscles that are usually involves in subjects with shoulder disorders such as impingement, tendinosis or rotator cuff tears. Details were added in the Methods, test procedures section:

“These muscles groups were chosen since they are the ones usually involve in patients with shoulder disorders such as impingement or rotator cuff tendinosis or
tear.”
This statement should be referenced.
The following are concerns that remain:

MAJOR COMPULSORY REVISIONS
What are the minimally clinically important differences in ROM, isometric strength, and the self reports of UE function? There are several results cited by the authors that may be statistically but not clinically significant.

Page 9, paragraph 1 – What were the authors’ reliabilities in their goniometric and isometric strength testing measurements?

Page 12, paragraph 2 – How many post-hoc examinations were done? If all possibilities were pursued, # should drop to # .0125 (dividing .05 by 1 for gender and 3 for age). This will change some of significant findings to non-significant.

MINOR ESSENTIAL REVISIONS
Page 7, paragraph 1 – It is unclear why the authors divided the ages as they did. What is the rational for the 3 divisions? Two divisions (18-39, 40+) would make the group distributions more similar.

Page 8, paragraph 3 – Why was external rotation data collected in supine and sitting?

Page 12, paragraph 1 – The sentence beginning with “However, the mean differences…” is not results related. It would more appropriately fit in the discussion section.

Page 13, paragraph 2 – The sentence beginning with “Again, the differences…” is not results related. It would more appropriately fit in the discussion section.

DISCRETIONARY REVISIONS
Page 9, paragraph 1 – Pictures of the data collection procedures would be helpful

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, and I have assessed the statistics in my report.