

Reviewer's report

Title: Comparison of isometric trunk rotational strength of adolescents with idiopathic scoliosis to healthy adolescents: an observational study

Version: 1 **Date:** 10 February 2007

Reviewer: Stefano Negrini

Reviewer's report:

General

The paper is relevant to the journal, the research well developed and the writing accurate even if it could be improved. There are some relevant points that should be stressed at least in discussion if cannot be faced immediately by the author according to the already collected data, because they could explain the results beyond possible hypothesis reported by the authors.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1. There could be a major flaw in the determination of the sides of contractions as concavity or convexity. According to the diagnosis proposed, patients #3013, 3016, 3017, 3018 and 3022 have double curves, that means also double concavity; moreover, according to the quantity of Cobb degrees, also patients #3024 and 3025 have very similar curves on both sides. This should be carefully explained, justified and eventually the statistica analysis should be repeated with a group of both sides asymmetries
2. The range of motions of patients have not been recorded, and this could have a big influence on final results, because 18° and 36° of rotations could also be considered as % of rotation of each single subjects, and in scoliosis patients typically there are asymmetries of movement between the two sides
3. The random order of movements performed was established on an individual basis ? If so, are there differences in the contractions performed at start and end of all tests between patients ? And again, there were differences between the two groups in the random order of contractions performed ? This is crucial to the results of the study
4. In the study vertebral rotations of single patients have not been considered at all. These could have influenced greatly the results, because the concave side is also the side of vertebral rotation in scoliosis. This means that, even the spines of the patients are already pre-rotated, and this could even be correlated to results much more than any Cobb degrees value.
5. In the discussion it is considered mainly the muscular aspect, but we know that the movement of rotation could be impaired also by restrictions of mobility due e.g. to bone deformity, ligamentous/muscular retractions, and so on: these should be at least discussed. Moreover the pre-rotation of patients could have a major role that must be discussed and it should be suggested as something to be considered for future studies

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. Why 18° and 36° rotations have been chosen for the study ? Please explain in the methods section
2. How has been the random order generated ?
3. How has been the highest mean torque and lowest variation determined ? Only looking at the "windows" (please explain also this term) or through any calculation ?
4. The concept of opposing muscle ratio should be explained not only in the text but also in Figure 3 caption
5. All abbreviations in all tables and figures should be adequately explained in captions (for tables in particular)
6. In Figure 1 there is the abbreviation CG (presumably control group) while in all the paper there is HG

Discretionary Revisions (which the author can choose to ignore)

1. I suggest an affirmative title, related to the results of the paper, and not to the methodology of it: e.g. "AIS patients have trunk rotational strength asymmetry: an observational study" or something like that
2. Abstract: is too long and could be truncated by Medline
3. Results section: there are to me too many numbers, while it would be much easier to read and

understand the paper if results would have been reported in terms of summaries of results, while numbers could be inserted only in tables. Readers are not interested in which statistics have shown something, but in what results have been obtained.

4. Is there any relationship, even if it could not be calculated with statistical reliability in such a reduced group, between gravity and force contraction? This could have been observed by the authors and could be reported in the discussion section because it could be of interest for future research.

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

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.