Reviewer’s report

Title: Comparison of the kinematics and kinetics of shoulder exercises performed with constant and elastic resistance

Version: 0 Date: 25 Jun 2018

Reviewer: Kane Middleton

Reviewer’s report:

The authors have investigated the kinematics and kinetics of the shoulder joint for 10 internal/external rotation exercises. These exercises were performed with both a constant and elastic resistance. Results showed that total RoM was not influenced by resistance type but moments were significantly higher with constant resistance. The authors have undertaken a well designed and written study that has clinical significance in the choice of exercise selection during rehabilitation. Some specific comments can be found below:

Introduction

P4L13: This paragraph introduces the issues with the tracking and modelling of the upper limb. However, this is not an aim of the study. Recent research (Campbell AC, Alderson JA, Lloyd DG, Elliott BC (2009) Effects of different technical coordinate system definitions on the three dimensional representation of the glenohumeral joint centre. Med Biol Eng Comput 47:543-550. https://doi.org/10.1007/s11517-009-0467-7; Campbell AC, Lloyd DG, Alderson JA, Elliott BC (2009) MRI development and validation of two new predictive methods of glenohumeral joint centre location identification and comparison with established techniques. J Biomech 42:1527-1532. https://doi.org/10.1016/j.jbiomech.2009.03.039) has been published that has developed a valid and reliable marker set and modelling approach for definition of the GHJC. Some of this paragraph could be moved to the methods and more detail about your aims and stating some hypotheses could be added to the last paragraph of the Introduction.

Methods

Throughout: Unless otherwise required by the journal, the term participants should be used instead of subjects.

P5L7: How much weight training experience did the participants have?

P5L21: What is your definition/determination of participants being 'physically fit'?

P5L32: "Five of the exercises are thought to train..." Thought by whom? Is this based on first principles or literature? If the latter, please include a reference.
P6L39: Please add more detail about how the new marker set differs from those described in previous literature.

P6L41. Do you have any validity or reliability data of the marker set?

P6L57: Please provide some additional detail of how the joints were functionally determined.

P7L39: What was the reasoning for normalizing moments by BW? Technically, you have normalised by mass (kg) rather than weight.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**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 am able to assess the statistics

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

Acceptable

**Declaration of competing interests**
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