Reviewer’s report

Title: Surface electromyography during physical exercise in water

Version: 1 Date: 3 March 2014

Reviewer: Zuzana Machotka

Reviewer’s report:

The title of this manuscript is ‘State of art in surface EMG during activities and exercise performed by humans in water.’ I congratulate the authors on submitting a review on this topic as it does address a gap in the research and will hopefully encourage future research into this area. However there are major aspects that need to be acknowledged before considering this review for publication (see below under major compulsory revisions). Although there are major revisions suggested, I strongly urge the authors to attempt these revisions as I believe this is a topic which would generate great interest. With changes the readability would improve and help guide the results, discussion and conclusion sections. Thank you for the opportunity to review such a manuscript.

Major Compulsory Revisions

1. I suggest that the authors refer to a previously published review from this journal in order to improve the methods and results section. The PRISMA checklist (http://www.prisma-statement.org/2.1.2-%20PRISMA%202009%20Checklist.pdf) or something similar may prove to be useful in revising this manuscript.

2. The aim of the study should reflect the methods. Currently the aim reads: “The aim of this study is to present an updated review of the literature on muscle activity recorded using sEMG in activities and exercise performed by humans in water.” Consider rewording to something like ‘This review aims to assess the effectiveness of surface EMG to measure muscle activity during aquatic exercise and compare its use to similar land based exercise situations.’ This may give the readers more specific information on why they should read this review. Additionally the conclusion can then match the aim(s)

3. Under methods; What data was collected in terms of EMG parameters and what statistical analysis was performed i.e. how did the authors assess the performance/effectiveness of EMG in water? This in my opinion is a major flaw in this manuscript and needs urgent addressing before publication consideration. For example signal strength, activation patterns were collected. Were point measures considered e.g. confidence intervals, standard deviations etc. What about reporting significance i.e. p values. Once this concern has been address the results can reflect the methods.

Minor Essential Revisions
1. Keep terminology consistent i.e. aquatic therapy, aquatic exercise, exercise in water, water-based exercise, aquatic physical therapy etc./ in water, in an aquatic environment
2. Consider ‘land-based exercise’ rather than ‘exercise on dry land’

Abstract

3. The aim of the paper should be placed under the background rather than the methods section

Introduction

4. The sentence “The buoyant force acting in the opposite direction to the force of gravity and drag forces in the opposite direction to the movement of the body in water cause muscle activation to be different in intensity and degree of participation in complex movements in water compared to dry environments, depending on the hydrokinetic analysis of the different activities and exercises used.” Is too long, consider revising

5. “Likewise, there is little understanding of muscle activity in water activities for use in sport, which are very useful for maintaining or improving the physical condition without placing excessive load on the spine and extremities[3]” Consider adding examples of water sports.

6. “The effects of aquatic therapy have been used in pediatrics[4], orthopedics[5], rheumatology[6], neurology[7] and many others[8].” Consider removing ‘The effects of’ and start sentence with Aquatic therapy is often used in ....’

7. “Common measuring biomechanical parameters during locomotion in water is complicated because most of the instruments are not constructed to measure in an aquatic environment.” Consider rewording and referring back to original aim e.g. ‘Measuring muscle activity during exercise in the water is difficult and often not attempted as most instruments are not designed for this type of environment and are therefore are often unreliable or not valid.’

Methods

8. Could the authors please incorporate the dates the databases were searched?

9. Was there a hierarchy of evidence for study design that the authors considered e.g. NHMRC evidence hierarchy. If only studies that compared water versus land base exercise were included then this should be reflected in the aim.

10. A flow chart of the process of inclusion of studies would be helpful

11. ‘Forty-two relevant articles were found in the main databases.’ This type of information could be considered a result and therefore may be better placed in the results section and not the methods

12. ‘The final selection was made based on the abstract or title…’ How were disagreements between authors handled?

13. The ‘Critical Appraisal Skills Programme’ used to assess the quality of the included studies has many version depending on study design e.g. systematic reviews compared to cohort studies. Could the authors be more specific as to which CASP tool was used to assess the quality and how it was scored?
14. “Appraisal criteria were not applied to the conference proceedings or abstract-only reports because their brevity limited the provision of methodological detail.” If the authors state the study designs that were included then these types of publications could automatically be excluded (they are often not considered in these types of reviews)

15. ‘Two independent reviewers [Cuesta-Vargas & Cano-Herrera]’....’ Initials of the reviewers would be sufficient here in brackets rather than the full names. Also how were disagreements resolved between reviewers?

16. Table 1: I do not understand why ‘dry’ is a keyword for this search. Was the term exercise not used as a keyword e.g. ‘aquatic exercise’ or ‘surface electrode’

17. One limit to the search is that only studies published in the last 15 years were considered. Could the authors justify this limitation?

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests