Reviewer's report

Title: Effect of fatigue-related activities on lactate level and its correlation with muscle function in older people: a crossover trial

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Reviewer: Carmelo Chisari

Reviewer's report:

The Authors studied a group of old people (more than 60 yrs) and designed a functional test consisting of 6 minutes or 12 minutes of walking at a maximum fast speed. Lactate level was evaluated before and after the test. Moreover, upper limb muscle function was measured by evaluating handgrip strength on a dynamometer. The lower limb function was assessed by means of the 30-s chair rise test (30 CRT).

The aims were: “to investigate the effect of two different walking intensities on lactate levels…” and “…to determine whether upper and lower limb muscle are associated with changes in lactate levels.”

The results showed “a significant time-effect for lactate level.” and “..only upper limb muscle function was significantly correlated with lactate...”. They conclude that “lactate levels increased accordingly following fatigue-related activities, while upper limb muscle function is a significant predictor of fatigue at maximal intensity”.

- Major Compulsory Revisions

This is a challenging field of interest and an interesting approach toward studying mobility impairment among older community. But, in this form, there are several major concerns regarding the all study:

1) First of all there is a quite complete inconsistency between the title and the whole study: they talk about “fatigue-related activities” but never described the effect of the tests on the fatigue symptom. On the other hand they talk about a “correlation with muscle function” but I’d talk about predictability. So I’d recommend to change the title describing really what they studied.

2) The authors have to provide data about a control group and must record both the distance covered during the 6 min and the 12 min test and some aspects of symptom fatigue (i.e. hearth rate, subjective scale of fatigue ecc.). In this way they necessarily have to correlate the functional data to the lactate levels.

3) The authors cannot talk about submaximal and maximal exercise: usually we can speak of maximal exercise when the subject get exhausted. They can only describe the duration of two different exercises.

4) The authors cannot compare a strength test of the upper limb with a functional test such as the 30-s CRT. The latter involves the joints, the spine, the balance whereas an handgrip test involves the distal upper limb muscles. The latter are
composed prevalently by type II muscle fibers and so more likely to produce lactate.

5) The hypothesis (line 9 page 4) is no clear and quite confusing.

- Minor Essential Revisions

Abstract

The methods and the results are not well described.

Discussion

Page 12 line 289. The authors cannot state “lactic acid production exceed its removal”. They didn’t measure the lactate in the recovery period after the exercise. The removal of lactate lasts for several minutes after the effort. Useful to read and possibly to cite (Abnormal lactate levels in patients with polymyositis and dermatomyositis: the benefits of a specific rehabilitative program. Bertolucci F, et al. Eur J Phys Rehabil Med. 2014 Apr;50(2):161-9) in relation to the importance of the recovery period.

Line 297 to line 314. Completely useless to the discussion.

Line 356. The statement is not reasonable with the study performed: you never measured fatigue!

Line 378 to 380. The statement is not clear: do you mean that you can use the upper limb muscle function to rehabilitate the walking capacity??

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

'I declare that I have no competing interests