Author's response to reviews

Title: Muscle recruitment patterns during the prone leg extension test.

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PDF covering letter
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Dear BMC Editors and Reviewers,

Thank you for your comments regarding my manuscript entitled “Muscle recruitment patterns during the prone leg extension test”. I found your comments very helpful and have made numerous changes to address the majority of your concerns. I have included your statements in the next section and will address your concerns in italics.

Reviewer’s report

Abstract

No clear statement as why it is important to assess activation patterns during leg extension or the clinical relevance of this.

The PLE is a common test used in a physical assessment. Much of its use is based on clinical beliefs. The aim of this study was to address those clinical beliefs as well as the differences in previous research which has attempted to do likewise. I have rewritten parts of the introduction to stress this idea.

You mention asymptomatic but asymptomatic of what no really clear here or later what you mean by this a statement of exclusion criteria would help.

Our exclusion criteria was added in more detail. Researchers took a brief history looking for previous trauma, mechanical disorders of the lumbar spine (i.e. spondylolisthesis), SI pain and previous lower limb injuries.

You alternate between describing the test as a prone leg extension and then a prone leg raise task, which one is the most accurate description of the movement performed?

prone leg extension: all references to raise were changed

Introduction

his can be cut down substantially.

A great deal of editing and cutting occurred
You need to clarify what type of musculoskeletal dysfunction you mean, and what body regions if you like may influence the leg extension task.

*Lumbopelvic dysfunction, this has been added*

In the 2nd paragraph of the intro you make a lot of statements and discuss theories but provide no origins or references if you prefer for these theories are we simply talking clinical beliefs or has there been science behind these theories.

*Clinical beliefs…statements were added to stress this.*

Also when you talk of tightness do you mean shortening or spasm or purely inflexibility?

*Tightness changed to muscle shortening (those that advocate this test often use the terms interchangeably to refer to a shortened resting length which theoretically can change resting posture. Very debatable. Hopefully, I can test this in my PhD.*

The paragraph describing Bullock-Saxton paper and then the Vogt Banzer paper are both too detailed and too long and can be condensed considerably as much of the information is irrelevant.

*I have condensed these.*

Methods

Need more details of study population inclusion exclusion. How did you know none had a chronic dysfunction pattern resulting from say back pain 5 years ago?

*Exclusion criteria added*

Did you exclude hip and knee injuries and SI injuries?

*yes, statement added to indicate so.*

EMG Processing

Why was 10% considered the cut off level.

*Used in previous research*

What were the resting levels of activity ie before the task was performed.

*Values were not normalized to an MVC but normalized to peak activity they were between at 1-4% yet at times, they were blips greater than 5.*

Why were 5 repetitions of the task chosen?

*Merely to have an average*

Results
Were the activation results consistent for each person for each of their 5 trials?

There was some variability, therefore we averaged individual trials as this is what is done in a clinical setting.

Last sentence of results should really be in discussion.

Discussion

1st paragraph would have been more useful to set the scene for the study in the introduction.

Paragraph was moved

You lose me on the last paragraph particularly the sentence “Even if a delay of approx 200ms in the gluteus.............that incorporates EMG.

Therapist advocate that one can assess muscle activation by looking at the prone leg raise and palpating musculature. We are questioning the possibility of this.

What other functional testing procedures are there that don’t include EMG?

Conclusion could be more concise by leaving out the last 3 sentences.

Discretionary Revisions (which the author can choose to ignore)

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

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

The case for this study and the important of the findings need to be argued more convincingly, at present there appears to be no relevance as to why this study was performed.

An attempt was made to argue that this is a common clinical test, often advocated yet not properly researched.
Reviewer's report II

General
The reviewed report has clinical relevance, however, there are number of issues which should be taken into consideration prior to possible publication.

b) Did the authors determine the muscle activation onsets in blinded fashion (i.e. not knowing the activation patterns of other muscles at the same time)?

No.

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

Table 1: error in muscle recruitment order column in subjects 5, 6 and 13.

Thank you for finding this. I checked the original data and I was missing a negative sign on two of the numbers in rows 5 &6. This was changed. As was row 13.

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

1) Ethics: was there any approval of e.g. local ethics board? I recommend to cite this issue or optionally give same explanation (e.g. a preliminary study) if there is no approval applied.

Yes, this is compulsory at my institution. Thank you for noting my omission.

2) A use of statistical analysis should be attempted (perhaps a non-parametric test) or if the authors are still not willing the use statistical tests, at least that decision should be discussed (justified) more extensively (and include a consultation of statistician). A believe that it would not change the result (i.e. will lead probably to the identical conclusion) but it deserves more reliable and objective justification for the conclusions.

I performed a non-parametric Kruskal-Wallis test. Thank you for the suggestion.

3) I disagree partly the form of the conclusion "a delay in GM firing and inconsistent firing patterns during the prone leg raise are not sufficient conditions to suggest musculoskeletal functioning abnormalities."
A would prefer the following form: "...prone leg raise is not a sufficient for diagnostic test (due to notable physiological variation (and probably therefore expected notable overlapping between normal (physiological) and potentially abnormal activation patterns)

It could be discussed that despite the limited clinical value of the test, the differences between group of patients and controls may still indicate impairment in motor control/muscle function.
The current study do not have any group of patients, therefore, it may conclude only issues relating to e.g. repeatability of the test and thus should be critical in placing conclusions on abnormal functioning.

I have changed our statement to your statement. Thank you for the suggestion.

As can be seen we have made the majority of the changes and believe the manuscript is substantially stronger. Thank you again for the comments and for considering our manuscript for publication.

Sincerely,

Gregory Lehman