Reviewer's report

Title: The effect of continuous ultrasound on chronic non-specific low back pain: A single blind sham-controlled randomized trial

Version: 3 Date: 25 June 2012

Reviewer: Gráinne Kelly

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Minor Essential Revisions

This manuscript reports on a study investigating 'the effect of continuous ultrasound on chronic non-specific low back pain'. The authors have addressed many of the original comments and areas for clarification which had been requested. There are still a number of minor issues which require some clarification or correction prior to this manuscript being ready for publication.

General Comments:

The authors use many terms to describe the ultrasound administered to the intervention group i.e. ‘real’, ‘continuous’, ‘true’. Similar comments are made regarding the terminology used for the control group with the authors using varying terms throughout the manuscript i.e. ‘placebo’, ‘sham’. The abstract, manuscript, tables and figures would benefit from consistency in language; one term should be chosen to reflect both the intervention and controls groups and should be used throughout.

Again, the manuscript would benefit enormously from proof-reading as there are quite a considerable number of punctuation and character spacing errors throughout, with too many errors to comment on individually e.g. spacing between words and punctuation marks in particular.

Abstract:

Background: In the second sentence, please detail the abbreviation US (ultrasound) in full prior to the abbreviation.

Background:

The authors state in the second paragraph that NSCLBP ‘is not linked to any underlying tissue damage’, however, later in the third paragraph they detail that ‘therapeutic US is among the commonly used physical modalities for treating soft tissue injuries...., there is a dearth of evidence for (its use) in patients with LBP’. These statements are quite conflicting, perhaps the authors could revisit these statements and detail more explicitly why US may be useful in the management of NSCLBP.
Second paragraph commencing ‘Specific back pain occurs …’: Referencing is required for the opening sentence of this paragraph.

Sixth paragraph commencing ‘Acoustic waves…’: Referencing is required or the first, second and third sentences of this paragraph.

Methods:

Interventions (US therapy section, second paragraph): Final sentence, language should be corrected to read; ‘the need to deliver energy to a large area’, rather than ‘an almost large area’.

Interventions (US therapy section, fifth paragraph): Referencing for the opening sentence requires correction to Hashish et al. [24]. The authors should revisit the ‘tense’ in which this paragraph is written, and correct to ‘past tense’ e.g. ‘the patient was not aware of what she/he ..... real US the patient was unaware ...’. The final sentence of this paragraph also has some language issues, a suggestion would be that the authors rephrase this sentence to read; ‘... patients were told in both groups that they may feel some heat and should this cause discomfort to notify the therapist in order to safeguard ...’.

Interventions (Exercise therapy section, first paragraph): Referencing in journal style is required for the opening sentence of this paragraph. Referencing is also required for the third sentence of this paragraph commencing ‘Studies indicate that stretching ...’.

Interventions (Exercise therapy section, second paragraph): Referencing is required for the first and second sentences of this paragraph. Also correct the abbreviation in the first sentence to ‘CLBP’, not ‘CLBL’.

Interventions (Exercise therapy section, fourth paragraph): Correct second sentence ‘warming-up’ to read ‘warm-up’. Also correct the sequence of wording in the third sentence to read ‘... patients were asked to maintain the daily home exercises for one further month’.

Outcome measures (second paragraph): Correct spelling of ‘electromyography’ second sentence.

Outcome measures (fourth paragraph, commencing ‘The primary outcomes were’): Please supply a reference for the VAS.

Results:

All tables and figures in the results section would benefit from the addition of further detail; this would allow them to be read alone without reference to the text. A key should be added to all tables explaining abbreviations, set values for significance i.e. p#0.05 etc.

Consistency of reporting both within the tables and text is required. In some areas numbers, are written as .01, whilst in others they are written as 0.01, as
suggestion would be to make all numbers consistent i.e. 0.01 etc. Similarly, within the text tables are referred to in some areas with a capital ‘T’ and in other areas with a lower-case ‘t’, this should be corrected for consistency.

Table 3 could be condensed from a spacing perspective, allowing it to be viewed on one page only. Also with reference to Table 3, the authors detail significance with respect to Time (denoted by an asterisk), however, is it possible to detail at which time point significance was achieved i.e. between pre and post, pre and 1 month follow-up, at all three time points.

Second paragraph commencing ‘Mean age of all participants ...’: In the second sentence the authors refer to Table 1 reporting no statistically significant difference in baseline characteristics or baseline outcome measures, however, Table 1 does not detail any significance values to allow for this statement.

Third paragraph commencing ‘Mean values for baseline ...’: The authors refer to the detail featured in Table 2. Improvements in FRI and VAS are reported, whilst these improvements do look likely to be significant, no reference is made to whether these improvements were significant and details of this should be included in the text.

Fourth paragraph commencing ‘The effect of the US...’: This paragraph would benefit from restructuring to state that ‘Table 3 details the results of the mixed model ANOVA showing the effect of continuous US versus sham US on outcome ....’. Otherwise this paragraph reads like it should be incorporated into the Data Analysis section of the Methods.

Discussion:

Fourth paragraph commencing ‘Mohensi et al ...’: The authors to a study by Mohensi et al. and detail greater improvements with manipulation and exercise, compared to US and exercise. Could the authors perhaps attempt to explain possible reasons for this difference, perhaps with respect to the outcome measures used, proposed mechanisms of action (manipulation versus ultrasound). Also correct ‘didn’t’ to ‘did not’, final sentence of paragraph.

Sixth paragraph commencing ‘However, the individual ...’: Referencing for the third sentence ‘Continuous moving ..’ is required.

Seventh paragraph commencing ‘A significant difference ..’: The second and third sentences should be corrected to read ‘Morisette et al [48] showed that ...’.

Ninth paragraph commencing ‘Clinical assessment of movement ...’: The first sentence would benefit from rephrasing to read ‘... in low back pain is predominantly done by measuring ....’. Also the third sentence would benefit from rephrasing to read ‘increase of ROM in the real US group may be due to the thermal ....’, no causal link has been verified in this study.

Paragraphs eleven through to the section on limitations would benefit from restructuring into more coherent paragraphs with progression of thought. At
present this section reads quite poorly and is quite disjointed. The final paragraph of this section (commencing 'one of the main ...') requires further reference support for the final two sentences.

Referencing

Again, the reference section requires attention for character spacing, punctuation and consistency of reporting.

**Level of interest:** An article whose findings are important to those with closely related research interests

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

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

'I declare that I have no competing interests'