Reviewer's report

Title: Joint motion quality in vibroacoustic signal analysis for patients with patellofemoral joint disorders

Version: 3 Date: 18 August 2014

Reviewer: David Bazett-Jones

Reviewer's report:

Major Compulsory Revisions

Non-specific comments:

LPCS – were these participants confirmed to have lateral tracking of the patella? If so, by which criteria? It might be helpful to have these criteria, next to the criteria for CMP and OA, in a table (at least in an abbreviated form).

One of the major concerns is that the control group is very different than the OA group. This study would be much improved if the control group was age-matched since individuals with crepitus can show no pain or other signs of OA.

Were the participants experiencing pain or other symptoms? I would be helpful to know how the participants were recruited. Were they all seeking medical attention? Were any of them asymptomatic?

Were the controls confirmed radiologically that they did not have any changes to their cartilage?

Either in the methods or discussion, the chosen dependent variables need to be explained as to why they are important. In some regards, they seem like arbitrary choices. Please explain why these variables are important to differentiating pathologies.

The statistical analyses seem to be 4 one-way ANOVAs. The more appropriate analysis would be a MANOVA. An explanation of why the chosen analysis is appropriate, or a change an analysis, seems to be warranted.

The discussion is weak and contradictory in places. It needs revision and improvement of integration of other literature (compare/contrast).

The conclusion is a reach since this is retrospective. Pathomechanisms are not investigated in this study and there is no evidence from this study that this has predictive or diagnostic power. Keep the conclusion to study-specifics.

Specific comments:

P5L113-115 – If the OA group was different in these three areas, then there are 3 significant differences. And these 3 make up 75% of the comparisons, so it seems the groups are quite different.

P6L126 – was the placement performed in a seated position?

P6L131-143 – the methods of data extraction could be given with some more detail to ensure replication. They are especially brief for someone unfamiliar with
the methodology (like myself).

P6L134-137 – why was the peak for each repetition taken instead of the peak for each phase? There seems to be a distinct difference during extension and flexion, especially in the LPCS group. Also, why was R4 calculated as peak minus minimum instead peak minus average? Or why not calculate as a ratio? Both VMS and R4 seem to be a measure of variability but how are they different and why is that important. This comment relates to the previous comment as well.

P6L142 – what is the purpose of the two bands? Does it have any clinical importance?

P7L151 – The results section should first give the results of the ANOVA analyses, then the results of the tukey analyses. The ANOVA with 4 levels should be significant first, then comparison of subgroups.

P7L151 – the results section could be improved with better organization. One paragraph could be used for each dependent variable. Its current form is a little confusing.

P8L186 - When something is not statistically significant, it should not be state that it is different.

P9L203-204 – how is your study different or similar to Reddy?

P9L211 – Is this saying that LPCS did not have disturbances in the cartilage? If so, why were the difference found in those 3 out of 4 variables? The explanation does not seem to clarify why there is a difference. Does increased compression increase the resultant and therefore increase friction? At what point during the motion does the peak occur? Does this coincide with initial patellar contact with the femur?

P10L203 – Here it is stated that LPCS and CMP would have high frequencies and amplitudes however, the P2 analysis showed LPCS is not different that controls. Visually LPCS does seem to have great amplitude but how can this be due to chondral degeneration since it was stated previously that there was not disturbance of the cartilage?

Minor Essential Revisions

Throughout the manuscript, abbreviations are used in some places but not in others. Either use abbreviations throughout the manuscript or remove them entirely to help with readability.

Abstract:

P2L34-35 – abbreviations are used without any explanations of what they are. Seems better to use full descriptions in the abstract

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

**Quality of written English:** Acceptable
**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests