Reviewer's report

Title: Self-reported knee joint instability is related to passive mechanical stiffness in medial knee osteoarthritis

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Reviewer: Martha Cammarata

Reviewer's report:

This paper provides interesting and useful data on the relationship between knee instability and passive frontal plane joint stiffness in patients with knee OA. It was well conducted and well written. My major comments concern presentation of appropriate, detailed results and the interpretation of finding.

Major compulsory comments:

1. Abstract: in the conclusion of the abstract the authors mention interventions that could overcome a lack of passive stiffness in OA patients. However, there are no mentions of such interventions in the discussion section. The authors should either remove this statement from the abstract or briefly elaborate upon this idea in the discussion section.

2. Introduction, final paragraph: please include a statement of the clinical and scientific impact this study will have on the understanding and treatment of knee OA. It would also help to summarize this again in the discussion/conclusion section.

3. Methods, statistical analysis: why is it necessary to have a linear relationship between the two variables? What if there was an exponential relationship between stiffness and joint instability?

4. Methods, statistical analysis: Please explain the rationale for requiring significant correlation using both Pearson and Spearman correlation coefficients. Why were both parametric and non-parametric coefficients used?

5. Results, Paragraph 1: Average varus/valgus laxity and stiffness are reported for the entire cohort. Because the purpose of the study is to assess correlation between these measures and instability, please provide a break-down of these measures according to self-reported knee instability, either in tabular or figure format.

6. Discussion, paragraph 1: Results indicated one statistically significant correlation between mid-range stiffness and instability. However, the r-value of this correlation is relatively low, at 0.27, and only explains 7% of the variance in joint instability. The authors should examine the meaning of this relatively low correlation and provide a context of their results for readers.

7. Figure 1: The color scheme makes interpretation difficult, especially for identifying the mid-range stiffness region for the patient with no symptoms of instability. Please revise.
Discretionary Comments:

1. Methods: Under Knee joint laxity and stiffness (1st paragraph): Subjects were asked to not contract the muscles crossing the knee during testing. How was this assessed to ensure no muscle contraction? EMG?

2. Results, Paragraph 2: Can the authors provide a figure demonstrating the relationship between stiffness and instability to complement the tabular results of correlation coefficients? I personally prefer figures to tables when results are presented and I'm sure many other readers do as well.

3. Results, paragraph 2: Here the authors refer criteria of “…significantly and consistently correlated…” Previously (Methods: statistical analysis) the authors use the phrasing “significant and similar correlations.” Consistent phrasing will make the manuscript read better.

4. Discussion, Paragraph 6: The overall theme of this paragraph is unclear. The beginning of the paragraph seems as if the authors intend to discuss the potential functional implications of lower passive stiffness joints in knee OA. However, the end of the paragraph implies that potential variations in neuromuscular control across subjects affected the results of the current study. Stylistically, the manuscript may flow better if the authors revise this paragraph to focus on factors which may have influenced their results.

5. Discussion, paragraph 6: The article by Lewek et al (2005) also provides data on muscular control strategies in knee OA patients with high instability vs. low instability and should be cited in this paragraph.

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