Reviewer's report

Title: Myofascial trigger points and innervation zone locations in upper trapezius muscles

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Reviewer: Siddhartha Sikdar

Reviewer's report:

Myofascial trigger points (MTrPs) are a characteristic finding in myofascial pain syndrome, and their pathophysiology has yet to be understood. This is an important study that demonstrates that locations of in the upper trapezius muscle may not necessarily align with the innervation zone of the muscle. This finding has implications for elucidating the pathophysiology of MTrPs. The manuscript is well written, and focused and the results are compelling. The study has been well designed and uses a novel methodology. I have a few questions that the authors need to address.

Major compulsory revisions

1. The description of how the innervation zone (IZ) was determined from the surface electromyography signals is not complete. I would appreciate a figure showing example sEMG waveforms from the electrodes during MVIC and the prediction of the IZ based on those waveforms. This is an important part of the methodology, and needs to be clearly described.

2. Figure 3 is compelling, and the authors should be commended for finding a rather ingenious and easily interpretable way to summarize a lot of data into one image. I appreciate the scatter plot in 3A, but I also suggest that the authors include an additional scatter plot for the locations of the IZ for each individual. Even though the authors found no difference between Active and Latent MTrPs, I recommend that the scatterplot in Figure 3A be labeled separately for active and latent.

3. What I find interesting in Table 1 is that the TrP-IZ distance does not seem to be normally distributed, but appears bimodal, i.e., a population of patients seem to have a larger TrP-IZ while others seem to have smaller. If indeed this is the case, then the mean is not a representative statistic. An additional analysis investigating this further with correlations with PPT or location of TrP would have been useful and strengthened the paper. As such Table 1 is presented without much analysis of a rich data set.

4. The difficulty with this study design is to get a good handle on variability so that some statistical arguments can be made about Figure 3. Manual localization of MTrPs is notoriously unreliable. Some test-retest reliability on a small number of subjects needs to be presented to get a better handle on the operator variability of the data in Figure 3A. Similarly, some test-retest statistics should be presented for the IZ localization. It appears that the authors already have the
data for this since the MVIC was repeated multiple times.

5. The authors need to provide some more justification about the choice of the TrP-IZ distance based on Figure 2. Why choose the distance along the X axis and not the shortest distance between the MTrP and a regression line passing through the set of IZ points?

6. The choice of the inclusion and exclusion criteria need to be discussed a bit more. It is not clear if the patients in the study have acute or chronic neck pain. It is also not clear if radiculopathy was excluded. The reason for the exclusion based on clinical depression needs a bit more justification.

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