Reviewer’s report

Title: Preventive effects of intermittent whole-body vibration and weight bearing on capillary number reduction and muscle atrophy in unloaded rat skeletal muscle

Version: 2  Date: 14 June 2014

Reviewer: Mary Barbe

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Major Compulsory Revisions

1. The authors should consider a new title that indicates that whole-body vibration and weight bearing only partially attenuate changes in unloaded muscles.

2. While the topic of the study is of great importance (the use of interventions to prevent atrophy and reduced numbers of capillaries in muscles occurring with disuse), the findings are overstated in several places. This is primarily because the weight bearing and intermittent vibration interventions used either had no significant effect, compared to controls, or only partially attenuated the effects of hind-limb suspension for most of the variables assayed. The author’s findings would be greater use to other researchers if they could please scale back their conclusions to state that VIB only partially attenuated muscle atrophy and the decrease in capillary numbers. This should occur in several places including the abstract (page 3, lines 57-58, in which it is indicated that VIB “was effective”, although it only partially attenuated HS induced changes), and throughout the discussion. For example, on page 15, lines 281-282 where the authors state that “attenuation of all of these pro-angiogenic factors were considered to be involved in capillary reduction in HS”. Since only VEGF-A and CD36 changed significantly compared to controls, only these factors should only be addressed here, please. Also, please 17, lines 319 through 322. The findings that were not statistically significant should be considered as such. The authors should scale back on these statements. In these sites, and others in the discussion and final conclusion, the authors need to be careful to not overstate their findings. More clearly indicating that the interventions were only partially successful (or not at all in some instances) in attenuating HS induced changes, will aid other researchers in their path to find either other inventions or alterations in these interventions that will rescue the disuse-losses better.

3. The aims of the study are not stated completely. Page 5 states: “In this study, the effects of VIB were examining using histological techniques on disuse-induced atrophied muscle to show changes in muscle vascularization in the rat soleus muscles”. Please restate to include the use of weight bearing and the use of mRNA methods, in addition to the histological techniques.

4. Can the authors please speculate in the discussion if variations of their weight bearing and intermittent whole-body vibration could possible lead to better
outcomes? Also, in the studies from other labs that had different results from this study, were the intervention methods different (time of weight bearing per day, cycles of vibration, etc).

5. Is it common to randomly assay muscles? I was under the impression that zones of muscles should be sampled in a consistent manner since some regions may alter while other may not.

6. The statistical section should indicate which statistical method was used for which assay/outcome.

Minor Essential Revisions
1. The authors need to put labels or clearer labels on the y-axis of figures 2-4.
2. C/F needs to be defined in the methods. It can be deduced from the abstract, and is defined in the abbreviations list, but could benefit from a definition here on first use too, please, similar to the other abbreviations.

This is an article whose findings are important to those with closely related research interests currently. Clarifying their actual findings, expanding in the discussion on how their methods may differ from that of other labs that had different results, and expanding ideas on how to perhaps improve the effectiveness of these interventions, would increase the level of interest considerably.

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

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.