Reviewer’s report

Title: The associations of leg lean mass with foot pain, posture and function in the Framingham Foot Study

Version: 3 Date: 1 October 2014

Reviewer: Babette Corine van der Zwaard

Reviewer’s report:

Dear authors and editor,

I want to thank the authors for their response to my previous review. I can see that the manuscript is more balanced and that the authors have used the feedback where they deemed it appropriate. Based on the authors’ response, the authors and me do not seem to agree on the appropriate approach to the study and it’s results. I am of opinion that the manuscript is not balanced enough towards causality in either direction. However, both are merely opinions, and therefore I would suggest an editorial decision or an impartial reviewer should assess both opinions.

Elaboration:

I agree with the author that cross-sectional studies can be an important asset towards further research; longitudinal or RCT. Especially when causal pathways can be substantiated by theory or related evidence. However, from a theoretical (physiological and kinematic) prospective it is equally possible to argue that a lower muscle mass is a result from foot pain as it is that foot pain is a result of lower muscle mass. Consequently, I’m of opinion that the specific cross-sectional relationships explored in this manuscript are of limited clinical interest.

The inability of a cross-sectional study to assess causality is mentioned throughout the manuscript. However, both in the authors’ comment and in the manuscript the specific causal pathway of lower muscle mass as a cause of foot pain and/or stance and functional deviation is still mentioned or alluded to. (Examples: “…we contend that our research question has important clinical relevance as it should be considered as a “first step” in determining the influence of leg lean mass on foot problems.” (Response letter) “Reduced muscle mass may play a role in the etiology of foot disorders and consequent poor function.” (abstract) “Identifying components of this pathway is important for developing targeted interventions to reduce disability resulting from foot pain.” (introduction) “These findings suggest that low muscle mass may be contributing factor to high arch foot posture in the general community of older adults.” (discussion) “…reduced muscle mass may contribute to extreme foot posture in older adults, perhaps playing a role in the etiology of physical limitations and disability due to foot disorders.” (conclusion))

The choices made in the topics of the discussion explore the relationships as this
one direction of causality. The addition of the opposite direction of causality in one sentence in the limitation section does not do justice to the kinematic and physiological probability of lower muscle mass as a consequence of foot pain in my opinion.

First review:
5. The division into sex groups seems like a good idea since there are many differences in outcome measures between men and woman (table 1). Unfortunately effect modification is not tested by adding an interaction term to the models. Therefore the choice to divide based on sex is not substantiated.

Authors response:
Effect modification and interaction do not necessarily mean the same thing. An interaction term in our regression model would test for statistical interaction, which in our case would test whether the joint effect of lean mass and sex differs from that which would be expected based on the independent effects of lean mass and sex. Our goal was not to describe the joint effects of lean mass and sex, but was instead to assess whether the association between lean mass and foot problems differs between the two sexes. This is more appropriately termed effect modification, which is most straightforwardly conducted and interpreted by the reader using stratified analyses, thus our choice to stratify is substantiated [1].

Response:
I want to thank the author for his response. Up until now I was only informed about the interaction term approach and not about the stratified regression approach. Thank you about informing me about this method.

Level of interest: An article of limited interest

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
I do not have competing interests.