Author's response to reviews

Title: Angle-torque relationship of the subtalar pronators and supinators in younger and elderly males and females

Authors:

Marco Hagen MH (marco.hagen@uni-due.de)
Daniel Sanchez-Bergmann DSB (daniel@sanchez-bergmann.de)
Sebastian Seidel SS (seidel-man@web.de)
Matthias Lahner ML (m.lahner@klinikum-bochum.de)

Version: 3  Date: 11 November 2015

Author's response to reviews: see over
Dear Prof Menz,

enclosed please find our revised manuscript entitled “Angle-torque relationship of the subtalar pronators and supinators in younger and elderly males and females” by Hagen et al., which we submit, upon second revision, to Journal of Foot and Ankle Research.

We would like to thank Dr Paterson for their very helpful and constructive comments. We have taken them into serious consideration and made several modifications based on them. Below, we have attached the comments of the reviewers and following these, our answers to each of the comments, separately. All track changes are marked in yellow.

Yours sincerely,

Matthias Lahner and Marco Hagen

(on behalf of all authors)
Angle-torque relationship of the subtalar pronators and supinators in younger and elderly males and females

Abstract

Comment 1.

Line 11: consider changing “Beside active subtalar range of motion, peak pronator and peak supinator torques were measured in five anatomical joint angles across the active subtalar range of motion by using a custom-built apparatus with two force transducers. Furthermore, relative torques (normalized to the individual peak torque) and pronator-to-supinator strength-ratios were analysed.” To: “Total active subtalar range of motion and peak pronator and supinator torques were measured in five anatomical subtalar joint angles using a custom-built apparatus with two force transducers. Furthermore, relative torques (normalised to the individual peak torque) and pronator-to-supinator strength-ratios were also calculated.”

Response: The sentences were rephrased according to your suggestions.

2. Line 12: delete “by”.

Response: “By” was deleted.

3. Line 17: Insert “and”: “Pronator-to-supinator strength ratio, AND peak pronator and supinator torques are affected by...”

Response: “AND” was inserted.

4. Line 19: “has” should be “had”

Response: “Has” was changed to “had”.

5. Line 27: flexibility is not range of motion, so I would suggest changing “flexibility” to “range of motion” throughout the manuscript.

Response: “Flexibility” was changed to “range of motion”.

6. Line 30: Change “Younger females have higher pronator strength capacity in the most pronated joint angle due to their higher subtalar flexibility when compared to all other groups.” To: “Younger females have higher pronator strength capacity in the most pronated joint angle, which may be due in part to their greater subtalar joint range of motion compared to the other groups.”
Response: We rephrased the sentence according to your comment.

Introduction

7. Line 42: “plantar flexors” should be one word.

Response: “Plantar flexors” was changed to “plantarflexors”.

8. Line 55: delete “however” and change “discussion about” to “research in to”

Response: The sentence was rephrased according to your suggestion.

9. Line 57: “medio-lateral distortions” should probably be something like inversion and eversion forces/moments/stresses. This should be altered throughout the manuscript.

Response: We changed “medio-lateral distortions” to “inversion and eversion moments” (also in lines 339/340).

10. Lines 60-2: I think you could probably delete these lines as most readers would be familiar with what pronation and supination is.

Response: The sentence was deleted. Ref. 16 was also deleted.

11. Line 66-72: I feel you need to strengthen the link to the purpose of your study. You mention your previous study in line 66 but not why is it relevant here. Eg what did it show? And more importantly, what hasn’t been done? Perhaps bring in lines 70-2 about the influence of age and sex, and then mention this hasn’t been investigated. Hence the purpose of the present study was to ....

Response: Lines 66-73 were rephrased.

12. Line 72: delete “therefore” (if you do the changes from my previous point and move line 70-2)-

Response: “Therefore” was deleted.

Methods

13. Line 80: insert “and” between “local university” and “the elderly”.

Response: “And” was inserted (line 80).
14. Line 88: “arch flexibility” should be “midfoot mobility”.

Response: We changed arch flexibility to “midfoot mobility” (line 87)

15. Line 98: delete “by”

Response: “By” was deleted.

16. Line 110: change “…were each positioned in approximately right angles” to “…were each positioned at approximately 90 degrees”

Response: “…were each positioned in approximately right angles” was changed to “…were each positioned at approximately 90 degrees” (line 109).

17. Lines 119-22: I see the authors have tried to address my previous point regarding what these angles are but I’m still unclear as to what these angles are: “The angles are related to [a] neutral position with the shank perpendicular to horizontal and the foot (2nd ray) oriented in parallel to the thigh.” But what are the angles between? Is it the angle of the rearfoot/calc, and is “neutral” a frontal plane angle of 0 degrees between the calc and tibia for eg?

Response: We added “…that the frontal plane angle between the calcaneus and the tibia was 0 degrees.” (lines 120/121).

18. Line 132: “subjects underwent a 10-minute on a bicycle ergometer…” should be “subjects underwent a 10-minute warm up on a bicycle ergometer…”

Response: The sentence was rephrased according to your suggestion.

19. Line 134-5: change “all subjects performed three valid of maximum voluntary isometric pronations and supinations in each subtalar joint angle.” To “all subjects performed three valid maximum voluntary isometric pronation and supination contractions in each subtalar joint angle.”

Response: The sentence was rephrased according to your suggestion.

20. Line 147: delete “build up”

Response: “Build up” was deleted.
21. Line 162 - sentence on p=0.05, precede with “Unless otherwise stated,” as line 166 reports the bonferonni corrected p value for the relative strength analysis.

Response: “Unless otherwise stated,” was preceded.

Results

22. Line 174-5: replace “younger females are more flexible in the pronation direction” with “younger females have greater pronation ROM”. Line 177 replace “flexibility” with “ROM”.

Response: “Flexibility” was replaced with “ROM”.

23. Line 185: replace “whose ascending part is missing between…” to “who do not show increase torque between....”

Response: The sentence was rephrased.

24. Line 204: “males” is spelt “ales”

Response: The orthographic error was corrected.

25. Line 206-8: Replace “In contrast, the ascending part is missing in younger females who show a nearly equal pronator strength capacity in -24° and -8° with 89% and 92%, respectively” with “In contrast, relative peak pronator torque of young females is nearly equal in -24° and -8° with 89% and 92%, respectively”

Response: The sentence was rephrased according to your suggestion.

26. Line 212: Change “There are found significant main effects of joint angle (P<0.0001; F(4,56)=79.9; \eta^2_p=0.59) and sex (P<0.01; F(1,56)=10.6; \eta^2_p=0.16) on relative pronator strength.” To “Significant main effects of joint angle (P<0.0001; F(4,56)=79.9; \eta^2_p=0.59) and sex (P<0.01; F(1,56)=10.6; \eta^2_p=0.16) on relative pronator strength were found.”

Response: The sentence was rephrased according to your suggestions.

27. Line 226: delete “merely”

Response: “Merely” was deleted.
Discussion

28. Line 244: “we find descending...” specify that this is from a pronated to supinated position and vice versa relative to each curve.

Response: “From a pronated to supinated position...” was added. It is not necessary to specify the joint angle orientation according to the inverted U-shaped pronator curve.

29. Line 250: “explain” should be “explained”

Response: “Explain” is changed to “explained”.

30. Line 264: change “young females are able to exert an even higher PPT of 41%” to “young females are able to exert a 41% higher PPT”.

Response: The sentence was rephrased according to your suggestion.

31. Line 270-1: this is a good theory but you should relate it back to your sample (and needs a slight grammar correction), eg you could finish with “One possible explanation for the age x sex interaction in ROM is that estrogen level decreases in postmenopausal women, and given the average age of our older female sample was 66.7 years, this would likely have influenced their results”...or something to that effect.

Response: The sentence was rephrased according to your suggestions.

32. Line 274: I think “lateral distortions” should be rapid inversion movements/moments/forces or something similar. Delete “it is assumed that”. The rest of this paragraph is a great discussion of your results – nice work.

Response: “Lateral distortions” were changed to “inversion moments”. “It is assumed that...” was deleted.

33. Line 308-10: Change “Despite significant main effect of age and significant age x angle interaction, all groups showed increasing PSR the more the foot is in supinated position.” to “Despite a significant main effect of age and significant age x angle interaction, all groups showed increasing PSR as the foot moved in to greater supinated angles.”

Response: The sentence was rephrased according to your suggestion(lines 309-311).
34. Line 310-2: Change “In general, this angle-dependent PSR characteristic is advantageous according to the aforementioned injury patterns of medial and lateral ankle distortions: In end-ranged supination, there is a higher relative pronator strength capacity, and vice versa.” To “As mentioned, this angle-dependent PSR characteristic, whereby relative pronator strength capacity was higher in end-ranged supination and vice versa, is likely to be advantageous in preventing lateral ankle injuries.”

*Response: The sentence was rephrased according to your suggestion (line 311-313).*

35. Line 314: what was the “respectively” referring to? May need to clarify this slightly.

*Response: We deleted “respectively” (line 315). Alternatively, we could have changed the sentence to “However, an appropriate amount of absolute pronator and supinator muscle strength is indispensable to counteract external supinator and pronator moments, respectively, during dynamic movements.” But this version does not appear reader friendly to us. We expect that the JFAR readers would understand that supinator strength is necessary to counteract external pronator moments and vice versa.*

36. Line 315: Change “Therefore, PSR is rather a supplementary than a single parameter for functional subtalar strength diagnostics” to “Therefore, PSR is a supplementary rather than a single parameter for functional subtalar strength diagnostics.”

*Response: The sentence was rephrased according to your suggestions.*

**Conclusion**

37. Line 332: Change “flexibility” to “active range of motion”

*Response: “Flexibility” is changed to “active range of motion”.*

38. Line 333-5: Given the findings of this study didn’t show the strength differences were due to difference in ROM (and ROM is not flexibility), I would suggest softening this sentence somewhat. Perhaps consider changing: “It has to be highlighted that younger females have higher pronator strength capacity in the most pronated joint angle due to their higher subtalar flexibility when compared to younger males and elderly subjects.” To: “Younger females were found to have higher pronator strength capacity in the most pronated joint angle, which may be partly due to their greater subtalar joint range of motion when compared to younger males and elderly subjects.”

*Response: The sentence was rephrased according to your suggestions (lines 335-338).*
39. Line 335-9: Consider changing: “As pronator and supinator muscle strength is important for dynamic joint stabilisation, in terms of feed-forward control [52] and to counteract medio-lateral distortions [14], the subtalar strength capacity and the PSR should be assessed isometrically across a wider range of subtalar motion for clinical purposes.” To: “As pronator and supinator muscle strength is important for dynamic joint stabilisation, for both feed-forward control [52] and to counteract excessive inversion and eversion moments [14], the subtalar strength capacity and the PSR should be assessed isometrically across a wider range of subtalar motion for clinical purposes.”

Response: The sentence was rephrased according to your suggestion (lines 338-341).

Table

40. Indicate in the headings (or elsewhere in the table) that values are mean +SD. Also, indicate the units (i.e. °) in Table 2.

Response: We integrated “mean +SD” into the headings (tables 1 and 2), and we added the units (° in table 2).

Thank you very much to your very helpful comments!