Author's response to reviews

Title: Foot pressure distribution during walking in young and old

Authors:

Mary Jo Hessert (mjhessert@yahoo.com)
Mitul Vyas (mitulvyas@hotmail.com)
Jason Leach (jason.leach@rockport.com)
Lewis Lipsitz (llipsitz@caregroup.harvard.edu)
Vera Novak (vnovak@caregroup.harvard.edu)

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Author’s response to reviews:

Response the reviewers comments
The authors wish to thank to the reviewer for constructive and detailed review of this manuscript. We have carefully revised our manuscript to address the issues that were raised. Overall, the manuscript is now more concise.

Reviewer 1 - Dr. Dieter Rosenbaum:
This study evaluated the effects of normal aging on foot pressure distribution during walking. Falls are the major cause of the longterm disability in the elderly people. Previous gait studies indicated a greater unsteadiness during walking in community dwelling elderly people, posing a risk for falls. However, the effects of normal walking on foot pressure distribution have not been well studied. This notion ahs been added to introduction.

Major compulsory revisions:
* Page 2, results: Thank you for this comment. The results section in the abstract has now been modified for clarity regarding medial calcaneus and to eliminate the confusion regarding "medial hallux", which was a typo.
* Page 3, paragraph 1: Reference to Rogers et all 1995 (1) is now added.
* Page 3, paragraph 2: To assess the possible effects of the foot shape, we have also analyzed the contact and unloaded midfoot areas, but found no significant differences between the groups. We have also analyzed the relative load on the medial and lateral arches, but found no significant differences between groups. The following notion has been added:

"Page 8: The relative load over the medial and lateral arches was not different between groups. Elderly subjects lower medial pressure values compared to young subjects, indicates that older people had tendency for greater weight bearing on the lateral mask relative to young subjects. The arch height, has not been measured, however, the contact mid-foot area was not different between the groups."

"Page 10: The foot shape (high vs. flat arch) has not been assessed. However, the midfoot contact area anc the relative load in the medial and lateral arch masks were not different between groups."
* Page 4, paragraph 2: Use of a treadmill as a control has now been explained in greater detail both here and on page 8. We agree with the reviewer that treadmill walking may differ from the normal walking pattern. However, in this analysis in enabled us to better control for the other variables that would affect foot pressure distribution, such as the changing speed.

"Page 4, paragraph 2: A treadmill was used to ensure a consistent speed, despite of its artificial milieu, as plantar pressure and force vary at different gait speeds."

"Page 8, paragraph 2: Treadmill walking is different than normal walking due to an inability to change speed voluntarily and reduced stride variability. Although an artificial pace and walking environment are imposed by use of a treadmill, it was a tool used to maintain experimental control. Because foot pressure distribution is affected by walking speed and stride variability, [6] it was deemed necessary to control the speed using treadmill walking."

* Page 6, paragraph 1: Foot pressure and forces result from combined effects of gravitational forces, proportional to body weight, and muscle activity. Body weight was significantly different between men and women. Normalized values were to account for these differences.
* Page 6, paragraph 2: These datasets reflect multiple measurements for each area. Repeated measures ANOVA allowed us to account for multiple comparisons of data from different masks that could be
correlated. As requested by the reviewer, the main results were also reanalyzed using nonparametric Wilcoxon test that rendered similar results.

* Page 7, paragraph 1: Units %BW/cm² were added to normalized pressure values.
* Page 7, paragraph 2: The statement regarding relative load has been modified and now appears on the page 8. See above.
* Page 9, paragraph 1: The discussion about the arch flattening as it pertains to FPD has now been broached and contact area was calculated but was not significant.

Minor essential revisions:
* Table 1: The value has now been corrected.
* Reference 4: The title of the article has now been added.
* Labels were added and corrected

Discretionary revisions:
* None requested.

Reviewer 2 - Dr. Nyska:
The authors wish to thank to the reviewer for constructive and detailed review of this manuscript. We have carefully revised our manuscript to address the issues that were raised.

Major compulsory revisions:
* None requested.

Minor essential revisions:
* Age differences and ranges mentioned in methods, now emphasized in limitations.
* The use of pronation and supination terms has now been corrected.
* The degree of arch flattening as it pertains to FPD has now been broached and the contact was calculated, but was not different between the groups.

"Page 8: The relative load over the medial and lateral arches was not different between groups. Elderly subjects lower medial pressure values compared to young subjects, indicates that older people had tendency for greater weight bearing on the lateral mask relative to young subjects. The arch height, has not been measured, however, the contact mid-foot area was not different between the groups."

* The notion regarding propulsion was added in the conclusions:" The forces and pressures under the medial foot masks were reduced in elderly people, resulting in lower propulsion during the step from the heel-touch to the toe-off phases. Clinically, lateralized foot pressure and lessened propulsion may affect walking ability in elderly people, posing difficulties in balance, forward thrust, and terrain adaptation."