Reviewer's report

Title: Does gait biomechanics in flip-flops differ from slip-on sandals, barefoot and shoes?

Version: 2 Date: 24 July 2013

Reviewer: Stephen Preece

Reviewer's report:

Major compulsory revisions:

1. The authors have made no attempt to integrate the information on sample size into the flow of the document. I would suggest at sentence at the end of the methods says something like “Given the relatively sample size, statistical power was calculated for each comparison…” This information then needs to be integrated properly into the text of the results section.

2. The authors could add a few words (line 151) to justify their choice of footwear in the manuscript.

3. In their responses the authors state …….We did use a virtual foot segment in ankle kinematic calculation in Visual 3D. We added the following sentence in the revised text: “A virtual foot segment which was defined as parallel to the shank but tracked with foot tracking markers was used in ankle angular kinematic calculation, and the ankle angle was, therefore, zero in static standing position.” (Lines 160-162)……

   This should be rephrased “…A virtual foot segment was defined which was aligned with the shank during the static trial and tracked with foot tracking markers. Interpretation of kinematic data with this approach is straightforward as a zero ankle angle corresponds to the standing trial. However, however this approach can mask kinematic differences resulting from differences in heel height between footwear conditions……” the authors should then state the differences between the relative forefoot-heel heights in each of the shoes.

4. The information on the calculation of the different parameters, now given as table foot notes, should be incorporated into the methods section. Diagrams would help to clarify how these parameters were calculated. Because it is not clear how parameters such as loading rate were calculated, it is not possible to properly interpret the comments in the discussion.

5. The authors have added the sentence: “Although unsubstantiated, it is possible that the subjects took longer steps in the open-toe footwear conditions.” (Line 275-76). Do not say it was unsubstantiated! - You should be able to obtain this information from you kinematic data.

6. New paragraph line 220, beginning the increased loading rate….

7. Replace plantarplexors with plantarflexors (line229).

8. The section which has been modified to “In the current study, we did not report
mid-foot torsion but based on findings of previous literature and suspect that a greater ROM of mid-foot torsion may have allowed for greater ML COP displacement in barefoot compared to other footwear conditions.” Should be rewritten as …“with our experimental approach we were unable to calculate mid-foot torsion, however it is possible that the greater ML COP displacement in barefoot compared to other footwear conditions, was the result of an increased mid-foot torsional movement.”

Discretionary revisions:
1. You have now added extra material (on the study by Chard) into the 3rd paragraph. Originally I had suggested this was combined with the 4th paragraph but, given the extra material, it would now be better as two separate paragraphs.
2. I still feel that the sample size is small for a study of this kind and this could limit the generalizability of the findings. I would recommend further data collection on at least another 5 subjects. However, I will leave the final decision on this to the journal editor.
3. In addition to the tables presented in the results section, it would be useful to have some comparison plots of the kinematic/kinetic/force/pressure curves in the results to show visually the differences between the four footwear conditions. These graphs should be referred to in the discussion and would make reading of this section much easier.

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

Quality of written English: Acceptable

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

Declaration of competing interests:

I declare that I have no competing interests