Author’s response to reviews

Title: Can Body Mass Index influence the fracture zone in the fifth metatarsal base? A retrospective review

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Version: 1 Date: 30 Nov 2019

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RESPONSE TO REVIEWERS

REVIEWER #2

Major

* I’m not sure this really is classed as an epidemiological study. Do you consider this necessary in the title?

We do believe this study is epidemiological in nature. By definition, a key feature of epidemiology is the measurement of disease outcomes in relation to a population at risk (https://www.bmj.com/about-bmj/resources-readers/publications/epidemiology-uninitiated/1-what-epidemiology). In our case, the population at risk was defined by Body Mass Index extracted by the general population who was affected by fifth metatarsal base fracture.

* Could Table 1 include the statistical test and result used to compare between groups?

This change has been implemented according to the Reviewer’s suggestion.
* The analysis involves only univariable analyses - did you consider a regression to adjust for BMI, age and gender in the one model. This would make the results more robust, despite there being non-significant relationships with the sex and age variables in the chi-squared and the ANOVA.

The Authors considered including a multivariable analysis using a logistic regression model. This type of model requires an explanatory binary variable adjusted for categorical or continuous variables. In this analysis a three-level explanatory variable (Zone of fracture) should be used, which makes this approach impossible. For this reason, the decision was made to use ANOVA and chi square tests in this analysis.

* I have some reservations about one of your inclusion criteria - the twisting-type injury. In a retrospective review, you are highly dependent on the clinical notes, and indeed on the patient recalling what happened. Stress fractures do not necessary have a defining incident, so it is possible that you missed a number of stress fracture? Or were you only wanting fractures that involve an injury?

In this retrospective review, a conscious effort was made to include injuries that could only be classified as acute. In the Authors’ view, the typical patients who attends the Accident &amp; Emergency department can clearly recall a definite and relatively recent event which caused his/her symptoms. While it is indeed possible that some of these patients might have had a latent, subclinical stress fracture before the injury as a predisposing factor, the Authors believe this to be an intrinsic limitation in the study, with relatively limited solutions available to overcome it. Obviously, pre-injury foot x-rays were not available and inquiring the patients about previous foot injuries and/or symptoms (which are usually referred without direct questioning anyway) would only have fuddled the picture more. Also, Kane et al used the same methodology in their epidemiological study.

* Another challenge with this type of design is the note taking regarding height and weight. Given this is one of your primary outcomes, are you confident that these data were collected in a standardized manner? Is it self-report or is there a protocol used at your hospital?

Morphometric data was collected through inquiry and self-report and was not directly measured. This is indeed a limitation of the study. Yet, the study aim was to establish a trend and the Authors believe this limitation was, at least partially, overcome by treating BMI as a continuous variable (as it was done with the ANOVA testing). This aspect was added in the limitations paragraph in the discussion section.
* Line 95: I'd suggest removing the word 'experimental' as this may inadvertently mislead the reader that this was an experiment

This change has been implemented according to the Reviewer’s suggestion.

* Line 96: Suggest change 'incidence' to 'prevalence'

This change has been implemented according to the Reviewer’s suggestion.

* I found Figure 2 confusing. It appears that zone 2 makes up 65-70% of people who are underweight - this doesn't match the under the graph. Can these data be checked?

The data in figure 2 are correct. What might confuse you is that the percentage reported in the table are not the ones represented in the histogram. In fact, the latter represent the ratio between fracture zone over the total of a weight class, while the former represent the ratio between weight class over the total of fractures zone. In other words, the ratios between histogram and table use the same data but the numerator and denominator of such ratios are inverted, and the table must be read horizontally. This was made more explicit in figure 2 description, in order to make its interpretation clearer.

Minor

* The dates used in the abstract and the methods are not the same - can you please look into this? Which is correct?

The dates in the manuscript have been reported erroneously. The correct ones are in the abstract. Changes were implemented in the manuscript accordingly.

* Suggest P values to 3 decimal places, and use a period rather than a comma.

All P values were reduced to 3 decimal places using periods rather than commas as per Reviewer’s suggestion.

* It would be clearer to use mean (SD) in the abstract and throughout, or alternatively mean +/-SD, but you have a mixture of both. Can this be made consistent?

This change was implemented according to the Reviewer’s suggestion.
* Some of the formatting in the abstract needs correcting, there are large gaps between the parentheses, and the kg/m² should have the '²' in superscript.

This change was implemented according to the Reviewer’s suggestion.

* I would suggest moving the URL for R into the reference list.

This change was implemented according to the Reviewer’s suggestion.

* Line 57: Lawrence and Botte needs a citation

This change was implemented according to the Reviewer’s suggestion.

* Line 61: Kane et al. needs a citation

This change was implemented according to the Reviewer’s suggestion.

* I would suggest you reconsider the use of 'causative' from the manuscript. Given the study type, a low level of evidence, the suggestion of any causative mechanisms may need to be tempered.

The sentence was changed using “possible explanation” instead of “causative mechanism” as per Reviewer’s suggestion.

Discretionary

* Suggest you consider changing 'have been' which appears through the abstract and across the paper to, 'were'.

This change was implemented according to the Reviewer’s suggestion.
* Suggest remove any initialisms from the abstract where they are not used more than once.
This change was implemented according to the Reviewer’s suggestion.

REVIEWER #3

*The Discussion, in its current form, is more of a review article and so needs to be considerably shortened and needs to focus on the aspect of this study.

The Discussion section was edited taking into consideration the Reviewer’s comment.

*Can the Authors be consistent are the zones categorized as 1, 2 and 3 or I, II and III. Please refer to original paper of Lawrence and Botte.

This change was implemented according to the Reviewer’s suggestion.

Specific comments:

Abstract:

*Foot Xrays. Is this sentence really necessary? On which radiograph is the LB classification made?

The sentence was removed taking into consideration the Reviewer’s comment.

*Is the description of the statistical analysis essential for the abstract? Please omit.
This section was removed taking into consideration the Reviewer’s comment.

*Results: Delete the first 5 words. Just from… This means that patients with the highest BMI, have the highest frequency of fractures that are more associated with non-union.

The sentence was removed taking into consideration the Reviewer’s comment.
*Conclusion: Please rewrite the first 2 sentences of the conclusion these are findings of the study. and then remove the final sentence.

This section was edited taking into consideration the Reviewer’s comment.

Background:

L31 This is a suggestion of poor English to come in the paper. If you cannot get it right in the first sentence it does not bode well.

The first part of this section was edited taking into account the Reviewer’s comment.

L33 please remove the term further, this is the first classification.

This was implemented in the previous change.

L35 does this mean more distally than the base or more distally than the proximal diaphysis please rewrite.

Considering the Reviewer’s suggestion about line 43, this part was removed.

L37 Add citation Martin O'Malley.

The citation was added to the sentence about zone 3 fractures.

L41 Please improve this sentence, it does not make sense, shorten, add citations of the several studies that have investigated.

This section was edited taking into consideration the reviewer’s comment. The Authors chose to remove the first sentence as it did not add significant value to this section.
L43 If this study just involves fractures of the base the description on L36 of the Dancers fracture can be removed.

The previous part of this section was edited taking into consideration the Reviewer’s comment.

L43 Please avoid the use of the term we. Write using the passive voice.

The term “we” has been consistently changed throughout the manuscript and the passive voice was used instead, as per Reviewer’s suggestion.

L44 5th metatarsal base fractures rather than this condition.

This sentence was edited taking into consideration the Reviewer’s comment.

Methods:

L50 Please rewrite and leave out initial pool.

This sentence was edited taking into consideration the Reviewer’s comment.

L51 This is a methodological concern, as fall off steps; foot inversions would be excluded reducing the numbers in the study.

Patients were meticulously inquired about the injury mechanism. When patients reported a “fall”, the Authors made a conscious effort to include only patients who reported a “twisting” movement in the process. This was done both during electronic medical record search and when inquiring the patients directly. The Authors believe this process helped minimize bias: in a “fall” mechanism a direct trauma can be often the culprit, which is a clearly different etiology. In the decision process about which injury mechanism was to be investigated, the focus was therefore put on a “twisting-type” injury only.

L53 Please explain what second localization means.

The term “metastatic disease” has been used instead of “second localization” in order to make the sentence clearer, as per Reviewer’s comment.
The Reviewer does not agree the methodology of this scoring is valid. It seems ridiculous but could be correct. Can the Authors please describe the reliability and reproducibility of this technique? and please will they for the Reviewer?

The Authors came up with the scoring system in order to make the methodology used to classify fractures as clear and explicit as possible. Three Authors have classified the fractures as described in the manuscript and points were assigned according to level of experience. The Authors believed this could help prove a more solid and consistent methodology in fracture classification. On the other hand, they also acknowledge that the value and weight of these “points” might have been assigned arbitrarily. In reality, the independent classification gave unanimous results in the vast majority of cases. Given the controversy that it might cause, the Authors finally decided to remove this section from the manuscript.

Results:

Please omit the chi squared here, already commented in methods.

This part was edited taking into consideration the Reviewer’s comment.

Discussion:

Please start the discussion with the sentence, the most important finding of this study is…this sets the tone for the paper.

Also please can the Authors remember the discussion is a discussion about their study not a Review article on the subject.

This part was modified according to Reviewer’s suggestion.

There is repetition in the content from the introduction, please leave/expand the introduction and focus the discussion on this study.

This part was moved to the introduction as per Reviewer’s suggestion

Please check the eponym, the Reviewer is unfamiliar with the term Stewart’s fracture. Please can the Editor Confirm whether an Author is able to create an Eponym or should they cite the paper in which the eponym in first used?
In order to avoid confusion, the term “Stewart's fracture” was removed.

L94-99 Please rewrite, perhaps illustrate with figure.
This part was removed as per the Reviewer’s suggestion to shorten the discussion.

L102 Please give citation.
As this part was removed in the shortening process, the citation was added later on in the manuscript.

L114 This comment was earlier highlighted by the Reviewer. The Reviewer notes the Author's comment here.
This part was removed as per previous Reviewer’s comment.

L128 Does this paragraph add to the paper? : we hypothesise is very formal, it is possible is better.
The Authors believe this introduction sets the tone for the subsequent part of the discussion, in particular on the distinction of the predisposing factors explaining our results (i.e. the role of excess weight on bone and soft tissue). The term “we hypothesise” was changed to “it is possible” as per Reviewer’s suggestion.

L170 This is very long discussion and perhaps can be shortened.
The discussion was shortened as per Reviewer’s suggestion.

L173-180 Please remove this paragraph, it does not really add to the study in question.
Within the given limits of our study (which are extensively discussed throughout our paper), the Authors believe this paragraph adds to the clinical implications of the analysis. This small section can lay ground for future search in the field with more clinically relevant aspects, which is exactly the purpose of this paragraph. The Authors believe it is therefore worth keeping it in the final version of the manuscript.
Conclusions: Please limit the comments in the conclusions to those that can actually be made from this paper.

This section was edited taking into account the Reviewer’s suggestion.

References:

Please consult the IFA regarding page numbering is it 49-55 in ref 3 or 537-8 in ref 4?

Correct format is as in ref 4 (https://jfootankleres.biomedcentral.com/submission-guidelines/preparing-your-manuscript/research). Yet, the exact citation was reported for ref 3 as a change of page numbering was within the article (http://hjdbulletin.org/files/archive/pdfs/179.pdf).

L262 Space or no space after :

Space was removed as per Reviewer’s suggestion.

Figure: Please can the Authors work on providing better images, the distinction between the zones is not clear on the current one

Better images were provided as per Reviewer’s suggestion