Author's response to reviews

Title: Association of calcaneal quantitative ultrasound parameters with metabolic syndrome in middle-aged and elderly Chinese: A large population-based cross-sectional study.

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Author's response to reviews: see over
Dear editor and reviewer,

Thank you very much for your kind letter and advice. We have revised the manuscript entitled “Association of calcaneal quantitative ultrasound parameters with metabolic syndrome in middle-aged and elderly Chinese: A large population-based cross-sectional study” (1530650141847143) in accordance with the reviewers’ comments. We would like to re-submit it for your consideration. The changes made are marked in red in the revised manuscript. Our responses to the reviewer’s report are listed in blue print on the next page. If you have any questions, please contact us without hesitation. Correspondence about the paper should be directed to Min Sun at drsunm@163.com by email.

With many thanks for your cordially help

Best wishes,

Sincerely yours

Min Sun
**Major Compulsory Revisions**

The OR need looking at and checking for the SOS. These are in stark contrast to most other QUS studies which demonstrate the Hologic Sahara can discriminate those with and without fractures - adv to look at the work for M L Frost et al. A statistician should check these OR.

The statistical method primarily used to analyze the impact of MS on fractures is not reasonable. We aimed to find out whether MS will affect fractures. So we re-analyzed the data by comparing the incidence of fractures in groups with and without MS. We found women with MS got higher incidence of fragile fractures than those without (6.8% VS. 5.3%, P=0.034), while no difference was found in men. These findings are amended to “Result 3.3”. Accordingly, we deleted table 4.

*The hypothesis in the discussion regarding MS reducing BMD, but not fracture should be reviewed. This is not working from the current evidence-base and there are plenty of data demonstrating the strong correlation between bone breaking strength and bone density (which account for around 80% of bone breaking strength)*

Since we revised the statistical method mentioned above, we found female with MS got higher incidence of fractures. This finding was coincident with the lower BMD in postmenopausal female with MS which was also found in this study. Apparently, those results agree with current evidence-based opinion that there is a strong correlation between bone breaking strength and bone density.

**Minor Essential Revisions**

Please ensure all acronyms are outlined in full the first time they are used throughout the paper. It is also not good practice to start sentences with an acronym and these should be amended for the full version.

We’ve made some changes accordingly.

*Page 2, line 4 - what criteria were used?*

National Education Cholesterol Program Adult Treatment Panel-III (NECP-ATP[III]) criterion was used. Amendment was made.

*Page 2, para 2, line 4, Ostalgia - this is not a common English term. Please amend*

Amendment was made.
2. Outline how many were excluded prior to analysis.

Amendment was made.

2.6 - t test and 2-test - please define the latter

It’s $X^2$ test.

The other measurements analysed ie alcohol, smoking etc. should be defined in the data collection part of the methodology as well.

Amendment was made in “2.1. study participants”.

Discussion - you should reference the papers regarding obesity and vitamin D metabolism and the fact that this is reduced in obesity. I believe J Compston wrote this up some years ago.

We did not reference this paper.

**Discretionary Revisions**

Page 2, para 2, line 6 - should read “the Chinese population over 40.....

Changes made accordingly.

Page 2, Para 3, line one - remove "and more....."

Changes made accordingly.

Page 2, para 3, line 2. It is not good practice to start a sentence with But – amend

Changes made accordingly.

Page 2, Para 3, line 12 change Till to Until

Changes made accordingly.

Page 2, Para 3, Line 15 change detection to investigation

Changes made accordingly.

Page 2 - final line, separate the following into the following

Changes made accordingly.

Page 3, line 1 - remove in Chinese population - you have already said this

Changes made accordingly.

2. Subjects - amend to participants, which is a generally more accepted term now

Changes made accordingly.

Line 2 - community-based project would be more elegant.
Changes made accordingly.