Author’s response to reviews

Title: Muscle strength and areal bone mineral density at the hip in women: a cross-sectional study.

Authors:

Julie A Pasco (juliep@barwonhealth.org.au)
Kara L Holloway (khollo@barwonhealth.org.au)
Sharon L Brennan (sharob@barwonhealth.org.au)
David J Moloney (david.moloney@barwonhealth.org.au)
Mark A Kotowicz (markk@barwonhealth.org.au)

Version: 4
Date: 22 April 2015

Author’s response to reviews:

Editor, BMC Musculoskeletal Disorders
22 April 2015

Dear Editor

Re: Muscle strength and areal bone mineral density at the hip in women: a cross-sectional study.

MS: 1576918977146700

Thank you for the opportunity to submit a revised manuscript again. The reviewers’ comments have been addressed and changes to the text are shown in red.

I believe the additions have improved the manuscript and hope that it is now acceptable for publication.

Regards

Julie A. Pasco
Corresponding Author

Title: Muscle strength and areal bone mineral density at the hip in women: a cross-sectional study. Pasco JA et al.

Reviewer 1

Minor Essential Revisions

In Table 1, authors did not show the numbers of low strength women. I would recommend showing the numbers of low strength women like high and mid strength women. In Table 1, I would like to make sure the number of high and mid strength women. If total number is 863, the number of low strength women
will be 1 for hip flexor strength and 7 for hip abductor strength. I am afraid the numbers are incorrect.

Response: We thank the reviewer for picking up this typographical error. The correct numbers now appear in the table.

Reviewer 2

Major It is confusing with the wording “6-year follow-up” when describing a cross-sectional study in the Abstract and in the Subjects. The reviewer suggests that the authors present the original cross-sectional data at baseline in all 1495 subjects and not this subgroup followed during 6 years with a great loss of participants, only around 800 left. It is confusing what has happened during the first 6 years; expectancy, intervention? If data are available for any intervention this is of greater interest to report. As the study cohort is called osteoporosis there must be DXA performed at baseline.

Response: The analysis is using cross-sectional data. The cohort commenced recruitment in 1993, but baseline assessments did not include measures of muscle strength – they were performed for the first time at the 6-year follow-up and that is the reason for the cross-sectional nature of this analysis. Please note that there have been no interventions; this is an observational study. As described in Methods, from 1494 assessed at baseline only 1217 were available/eligible for assessment at the 6-year follow-up; the numbers of deaths, migration, loss of contact and inability to provide informed consent have been published (refer to citation 7). As this is not a longitudinal analysis, but cross-sectional at this phase of the study, it does not seem relevant (or necessary) to repeat these details. However, they can be included at the Editor’s request.

Changes have been made to the text in the abstract and in the limitations section of the Discussion to address the reviewer’s point.

Abstract (Methods): the first sentence now reads: “This cross-sectional study utilises data from 863 women assessed for the Geelong Osteoporosis Study.”

Discussion (page 10): Nevertheless, as this is a cross-sectional analysis of data collected at a follow-up phase of a cohort study, we cannot exclude the possibility that there may have been differential loss to follow-up related to these musculoskeletal parameters.

Furthermore, in Limitations; the present study is not a random population sample as it is a cross-sectional study on a re-examination (6th year). These subjects, only around 50% left, are strongly selected.

Response: The sentence referring to a random population has modified accordingly.

Discussion (page 10): The main strength of our study is that participants were drawn from the general population and spanned the full adult age range.

The conclusion must be corrected as the present statement is inappropriate. The correlation between muscle strength and aBMD at the hip was solely explained
by the lean body mass.

Response: The conclusions in the abstract and the main body of the text have been rewritten.

Abstract (conclusion): There was a positive association observed between muscle strength and BMD at the hip. However, this association was explained by measures of lean mass.

Conclusion (page 11): Within these constraints, however, we report that the observed association between muscle strength, for hip flexors and abductors, and total hip BMD in women was nullified after adjusting for lean mass. Therefore, it seems that lean mass, rather than muscle strength, impacts on bone density.

Minor It is not clear from the legend to Figure what the black dots are representing. It is not clear what appendicular lean mass T-score <=2 stands for.

Response: The black dots represent individuals with low appendicular lean mass, which corresponds to a T-score less than -2. The figure legend has been expanded to state that the T-score has been calculated according to the published reference range cited in reference 12.

Results (page 6): The positive relationship between muscle strength and total hip BMD is presented in Figure 1, which also shows that individuals with low appendicular mass (black symbols) clustered in the lower ranges for both muscle strength and BMD.

Figure 1 legend: Black symbols represent individuals with low appendicular lean mass (T-score < -2, according to published reference ranges [12]); data for all other individuals are shown in grey.