Author's response to reviews


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Version: 3 Date: 11 February 2009

Author's response to reviews: see over
Author's response to reviews

Title:

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Version: 2 Date: Rabat, January, 31, 2009

Author's response to reviews: DR OLIVIER BRUYERE
Reviewer's report

Title: Relationship between physical performance measures, bone mineral density, fall and the risk of peripheral fracture: a cross-sectional analysis

Version: 1 Date: 20 November 2008

Reviewer: OLIVIER BRUYERE

Reviewer's report

Major Compulsory Revisions

Author’s response to reviews:

Thank you for reviewing our manuscript “Relationship between physical performance measures, bone mineral density, fall and the risk of peripheral fracture: a cross-sectional analysis” and for your relevant comments.

We will answer point-by-point to your comments. We hope you will be satisfied. All changes were carried out in the new version of the manuscript and underlined to be visible.

Comment

- The results section of the abstract should be more explicit: for example, it is not sufficient to say that TGUG was correlated with BMD. The authors should indicate how was the association. For example, it could be clearer to say that “a highest TGUG test was associated with a lowest BMD”. It is true for all the text.

We carried out the requested modifications:

Results: A highest ‘TGUGT’, ‘5 TSTS’ and ‘8 FSW’ tests were associated with a lowest BMD measured in different sites

Page : 2 Line : 11

In univariate analysis, a highest ‘TGUG’, ‘5 TSTS’ and ‘8 FSW’ tests were associated with a lowest BMD measured in different sites

Page : 8 Line : 22

- Because of the design of this study (cross sectional study), sentences such “the decrease of physical performance was associated with an increase of peripheral fracture risk” are not correct. In this case, the decrease in physical performance was associated with history of fall or history of fracture”. Please revise the whole manuscript.

As requested, we made all modifications and revised the whole manuscript:

This study suggested that low physical performance is associated with low BMD, and a high risk of history of falls and fractures.
- Abstract: delete last sentence not supported by results.
We deleted the last sentence which is not supported by results

- Abstract: please provide us with IC95% when reporting OR
We added the IC95%:
After adjusting for age, BMI and total hip BMD by logistic regression, a score of ‘TGUGT’ > 14.2 sec, a score of ‘5 TSTS’ > 12.9 sec and a score of ‘8 FSW’ > 4.6 sec respectively, increased the probability of anterior peripheral fracture by 2.7, 2.2 and 2.3 (OR = 2.7; 95% confidence interval (CI) = 1.2-6.4; p = 0.019 OR = 2.2; 95% confidence interval (CI) = 1.1-5.2; p = 0.049 and OR = 2.3; 95% CI = 1.1-5.1; p = 0.033).

- The authors perform analysis after adjusting for variables. However, the number of covariates varies widely between analyses (e.g. with age, or with age, BMI and BMD, with age of menarche, BMI, calcium, activity). All analysis must be adjusted with the same covariates.
Thank you for your comment
The number of covariates varies between analyses because for each multivariate analysis, we adjusted on covariates having a nominal P value <0.1 in univariate analysis

- The authors state that “Each patient completed a questionnaire on sociodemographic parameters and osteoporosis risk factors ». To the best of my knowledge, these elements have not been used in the analysis. This remark is also true for number of pregnancies and age at menopause. I would suggest to perform some new analysis taking these elements into account.
Osteoporosis risk factors were used to exclude patients to avoid secondary osteoporosis.
We already realized a statistic analysis using different parameters including number of pregnancies and age at menopause, but there was not significant statistical relation.

- What were the risk factors for osteoporosis assessed ?
The risk factors for osteoporosis assessed were:

1- Secondary Osteoporosis : Medications That May Cause Bone Loss (Aromatase inhibitors, Cancer chemotherapeutic drugs, Glucocorticoids, Gonadotropin releasing hormone (GnRH), Heparin, Thyroid hormones in excess) - Diseases and Conditions That Cause Bone Loss (Anorexia Nervosa, Malabsorption syndromes, Celiac Disease, Cushing's syndrome, Hyperthyroidism, Hyperparathyroidism, Inflammatory Bowel Disease, Rheumatoid Arthritis, Kidney disease), Smoking, Alcohol abuse.

2- Body mass index
3- **Family history of fracture**

The patients having the risk factors for secondary osteoporosis were excluded at the beginning of our study.

- **How was assessed the history of osteoporotic fracture?**
  The patients were asked, on a questionnaire, to provide information on their fracture history following a minimal trauma. Their doctors declared that their fractures correspond to the osteoporotic fracture. We considered: hip fracture, wrist fracture and other peripheral fracture

- **More information about the assessment of history of fall must be provided (e.g. during the last month, the last year?)**
  *We added the information about history of fall:*
  … the self-report history of falls occurring in the last year

- **The questionnaire of Fardellone needs to be referenced.**
  *The questionnaire of Fardellone reference was added:*
  The frequential self-questionnaire of Fardellone [15] has been modified, simplified and adjusted to the food habits of Moroccans


- **Results: please define “osteoporosis” (i.e. how was it assessed? using T-score? which site?)**
  The required changes are done:
  Among menopausal women (n= 360), 31 % were osteoporotic at any of the measured sites (spine, hip) (we used the WHO classification of osteoporosis which defined Osteoporosis: BMD 2.5 SD or more below the young adult mean (T-score at or below -2.5) any measured sites. In the T-score calculations, the manufacturer’s ranges for European reference population were used because of the absence of a Moroccan database.

- **The rationale for the dichotomization of the 5TSTS (>12.9sec) must be provided. Why below the mean? Could the authors find a more scientific concept? Same remark for 8 FSW and TGUG.**
  *Thank you for your comment*
We reconsidered the rationale for the dichotomization of the tests performance. Based on another reviewer comments, we used test performance cut-points (ROC) curves to determine the test performance cut-points for dividing the sample into below and above average performance instead of using the mean of performance.

The best cut-off point for each physical performance measure using (ROC) curves is: 14.2 sec for “TGUGT”, 12.9 sec for “5 TSTS” and 4.6 sec for “8 FSW”

- The authors report variables using the mean or the median. The rationale for using one or the other should be explained in the methods section.

As a statistic rule, for a normal distribution, (gaussian distribution) the mean is used and for not symmetric distribution (parameter distribution is not Gaussian), the median is applied.

- The authors report analysis in the subgroup of post-menopausal women. What is the rationale? I would suggest to keep the whole study population.

The relation between physical performance tests and peripheral fracture was realized with only post-menopausal patients because osteoporotic fractures are mainly observed among post-menopausal women

- Could the authors explain the “perceived tendency to fall”? How was it assessed?

This sentence was rectified:

<table>
<thead>
<tr>
<th></th>
<th>Fall history</th>
<th>No fall history</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>TGUGT (sec)</td>
<td>12.8</td>
<td>9.9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>5 TSTS (sec)</td>
<td>14.6</td>
<td>12.0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>8 FSW (sec)</td>
<td>4.5</td>
<td>3.3</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

- The authors over-interpret their results (e.g. “Our findings suggest that physical performance may promote an osteogenic effect in the hip and lumbar spine.”).

Thank you for your comment. We deleted this sentence as requested

- I do not agree that “A decrease in physical performance may cause a vitamin D deficiency”.

At least, references should be provided. More generally, all statements must be supported by results or by references.

Thank you for your precision. This sentence was rectified:
It is thought that a decrease in physical exercise, which would result in insufficient sun exposure due to a reduction in outdoor activity, may lead to a vitamin D deficiency, thus producing a reduction in bone density.

- Table 1: T-score of BMD must be provided.
  *We added the T-score of BMD in table 1*

- Figure 1 does not provide us with a lot of interesting information. I would suggest to delete it.
  *Please note that we believe that this figure is a good way to show the correlation between the three physical performance tests and BMD*

**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'