Reviewer’s report

Title: Osteoporotic fractures and obesity affect frailty progression: A longitudinal analysis of the Canadian Multicentre Osteoporosis Study

Version: 0 Date: 13 Oct 2017

Reviewer: Gianluca Testa

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To the Authors
In the manuscript entitled Osteoporotic fractures and obesity affect frailty progression: A longitudinal analysis of the Canadian Multicentre Osteoporosis Study, Olga Gajic-Veljanoski et al. aimed to explore the effects of modifiable and non-modifiable factors on changes in frailty in community-dwelling adults aged 50+ years who participated in the Canadian Multicentre Osteoporosis Study (CaMos).

On 5566 women and 2187 male community-dwelling subjects, they examined the rates of change in frailty over 10 years using the 30-item CaMos Frailty Index (CFI).

Two modifiable risk factors, incident low-trauma fractures and obesity, consistently increased frailty. The long-term effects of low trauma fractures were different between two sexes and depended on the history of fracture. In particular, in women who never had

a low-trauma fracture, incident hip and clinical vertebral fractures did not affect the progression of frailty while an incident hip fracture was associated with frailty progression in men. Moreover, Individuals with prior fractures had more comorbidities and were frailer at baseline. In these subjects, irrespective of the sex, an incident hip fracture significantly increased frailty over 10 years. In addition, obesity consistently contributed to frailty progression in both women and men with its impact being greater in adults who had no history of fractures and were less frail at baseline. Finally, the authors show that quality of life and physical activity are protective against frailty.

Overall this is a very interesting manuscript focused on frailty progression in subjects affected by osteoporosis. In general the study is well conceived, the robust statistical analysis, which is essential to the aim, is, to my opinion, appropriate and the manuscript is well written. I have only a few minor concerns that I believe the authors should address before considering the manuscript suitable for publication in BMC Geriatrics.

Minor issues

The introduction should be improved, in particular on how frailty progression has been studied and why the factors that might affect this progression are not clear.
The 30-item CaMos Frailty Index (CFI) should be reported somewhere either in the manuscript or in the supplemental materials.

In table 1, the authors report on lifestyle factors. These are mostly cardiovascular and respiratory risk factors. The authors should better describe, in the table and in the text, the cardiovascular, respiratory and kidney comorbidities.

There are several typing errors.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

**Quality of written English**
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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