Reviewer's report

Title: Longitudinal analysis of vertebral fracture and BMD in a Canadian cohort of adult cystic fibrosis patients

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Reviewer: Francesca de Terlizzi

Reviewer's report:

Major compulsory revisions

The manuscript is dealing with a particular pathology of great interest from the osteologic point of view. As the authors have mentioned, the progressive increase in life expectancy of cystic fibrosis patients, the need to take into account comorbid conditions, such as bone fragility and risk of fractures. The article needs some improvements, the following comments are requested to be addressed.

One weak point of the study is the presence in the study group of adult and young subjects, already in the bone growth period: this fact can alter the results of BMD evaluation both at baseline and at follow-up. I suggest the authors to provide DXA measurements in absolute values (BMD) as well as in terms of T-score and, more importantly, of Z-score, in order to correct as much as possible for this problem. Furthermore also the changes in BMD during the study period should also be reported in terms of Z-score.

The particular nature of this population, the presence of both adult and young adolescents, should be mentioned clearly in the manuscript, especially in the discussion and limitation of the study.

ABSTRACT
The characteristics of the population should be described in detail: age, sex, BMI, BMD T-score and Z-score at baseline.

RESULTS
Page 9: the occurrence of fractures during the study period should be more clearly stated: were all incident fractures? What was the associated trauma? How much low trauma fractures were observed? How it is possible that a patient had a vertebral fracture at baseline that was not present at follow-up? What can be the reason? This should be discussed.

The rate of inhaled corticosteroid during the study period was corrected for the individual follow-up time for each patient? This should be done before testing the difference between fractured and non fractured patients. How were divided the patients on the basis of the presence of fracture? Were considered as fractured those who were already fractured at baseline, or only those who fractured during the study period, or both? Please clarify.
The rate of bone loss has been reported in percentage, but the standard deviation or standard error should be reported, even in percentage, if preferred.

The outlier evidenced in the calculation of BMD changes should be considered in light of the expression of the results in terms of Z-score.

All BMD changes should also be expressed in terms of Z-score throughout the manuscript.

Last paragraph of the results: what were the BMD changes at the femur?

DISCUSSION
What was the BMI in the fractured group? Was it in the healthy range?

Please discuss the role of PTH in the evaluation of bone quality.

Please discuss the longitudinal effect of subjects already in the bone growth period (< 25 yrs of age).

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
'I declare that I have no competing interests