Reviewer's report

Title: Hyperthyroidism and Bone Status: Impact of Severity, Duration, and Etiology of Hyperthyroidism on Bone Turnover Markers and Bone Mineral Density

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Reviewer: Olivier Chassande

Reviewer's report:

In the manuscript entitled “Hyperthyroidism and bone status: impact of severity, duration, and etiology of hyperthyroidism on bone turnover markers and bone mineral density”, El Gawad et al. analyze the correlations between bone mineral density of the radius, several serum markers of bone metabolism, thyroid hormone concentrations, and the duration of hyperthyroidism after diagnosis. Moreover, they compare two groups in which hyperthyroidism is caused either by Graves’ disease, or by toxic multinodular goiter. They show correlations between TH levels and biochemical markers of bone turnover, but no correlation between TH and Z scores, or between Z-scores and biochemical markers. They show that the etiology of hyperthyroidism does not affect bone or serum parameters. Finally, they show a good correlation between the duration of hyperthyroidism and Z-score.

This study is well done but does not provide major advances in the understanding of the mechanisms underlying thyrotoxic-induced bone loss. The discussion should be revised, as detailed in the comments below. Showing the correlation data between TSH concentration (which has been measured by the authors) and different parameters of bone metabolism could be of great interest and enhance the impact of the paper.

No major compulsory revisions are required.

Minor essential revisions:

There are a large number of spelling mistakes throughout the text.

The sentence "however, assessment of bone mass in patients with hyperthyroidism is recommended in cortical bones than trabecular bones" does not make sense.

The sentence “In the present study, bone densitometry was done….goiter” also needs to be corrected.

The authors show a good correlation between thyroid hormone concentrations and serum biochemical markers of bone remodeling, but the absence of correlation between TH concentrations and z-score, and between Z-score and serum markers. These findings are unexpected and should be discussed.

In the discussion, the authors mention that cortical and cancellous bone may be differentially affected by TH status, and quote their own study on the left radius.
However they do not discuss whether in this bone cortical or cancellous bone is predominant. Therefore there is no connection between the data and the reference and this paragraph lacks consistency; The authors should discuss their data as compared to other previously published works.

Discretionary revisions

The authors discuss the potential role of TSH concentration on bone mineral density, but they do not show any data. It is surprising since they have measured TSH in patients and therefore should be able to show correlation data between TSH concentration and bone remodeling parameters. This information would increase the interest of the paper and support the discussion.

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

Quality of written English: Needs some language corrections before being published

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.