Reviewer’s report

Title: Iodine concentration calculated by dual-energy computed tomography (DECT) as a future parameter to evaluate thyroid metabolism in patients with hyperthyroidism

Version: 1 Date: 11 May 2017

Reviewer: Ronnie Sebro

Reviewer’s report:

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The authors have substantially revised the manuscript and it is in much better shape than the initial submission. There still remain a few statistical considerations that need to be addressed. First, the authors compare the uptake values of each lobe of the thyroid gland separately and compare that to the CT attenuation of each gland - as stated in my earlier review this results in increased correlation because of within-individual correlation. The authors can assess the veracity of this statement by measuring the superior, middle and inferior lobes of each thyroid gland separately and compare those to the CT attenuation of the superior, middle and inferior lobes of the thyroid gland - naturally this correlation will be greater in magnitude (and more significant) than that assessing each lobe separately and naturally, greater in magnitude than that assessing each patient separately.

The graphs should have the estimated correlation R as well as the p-values. I suspect that figure 5d should be more significant than the authors believe. This graph looks more clustered than Figure 5b. Figure 4 should be repeated by individual rather than by lobe analysis.

The discussion seems to conflict with the introduction. In the introduction, the authors expect a low CT attenuation density and use reference 5 for this assertion. Then in the discussion, the authors talk about edema and vascularity as lowering the CT density.

The authors also loosely use Graves disease and hyperthyroidism interchangeably. The results may have been different if the patient had solitary adenoma, pituitary disease contributing to hyperthyroidism, multinodular goiter etc. Graves accounts for the majority of hyperthyroidism cases, but not all. The authors also talk about a single CT measurement - they are in fact referencing the CT attenuation/attenuation density. This paper needs to be written clearer.

In the Methods, it seems temporally that the DECT followed the RAI study. The time between both studies was not noted. Why was the DECT even ordered? Thyroid gland volumetry was performed, but not reported etc.
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
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No

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