Reviewer's report

Title: Salivary cortisol differs with age and sex and shows inverse associations with waist-hip ratio in women: a cross-sectional study within the Skaraborg Project

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Reviewer: Uberto Pagotto

Reviewer's report:

In this cross sectional study the authors investigated the relationship between morning and evening cortisol (in saliva) and fat distribution.

Major Compulsory Revisions

Although this is a large study, nonetheless there are several limitations: (i) this study was probably designed for other aims, and the investigation of the cortisol in saliva appears to be a secondary aim; (ii) many more salivary samples should be collected to properly investigate HPA dynamics throughout the day; (iii) several limitations have been discussed by the authors themselves. Nevertheless, the data are of interest, and some findings are new whereas others confirm previous researches.

Minor Essential Revisions

- Please define whether morning cortisol was collected just before work-up or at random, provided all subjects were in the fasting state. Moreover, were evening sample collected after dinner?

- The tables reports some significant differences in the morning and evening cortisol in relation to sex and age. However, both modify body composition and BMI values, but associations between cortisol and fat distribution were not adjusted for BMI. In the literature there are several examples of association between BMI and/or WHR (or waist).

- The authors found an association between cortisol and WHR in women. However, the potential confounding effect of estrogen compounds was taken into account in the multiple regression analysis. I’m wondering what happens if those women taking estrogens were excluded from the analysis. Estrogens can in fact modify body composition, fat distribution and, additionally, cortisol metabolic clearance rate. I’m not convinced that adjusting for these confounding compounds can definitely exclude potential bias.

- In table 1 the authors distinguished males and females under 50y and over 50y. I think that this classification is unnecessary and eventually misleading. The authors have cortisol data in different decades of age. Therefore, age effects can be observed looking at these data. Finally, in the evaluation of male and female cortisol values, the authors used age 30-39 as the reference for further analysis. This is completely arbitrary. If all decades are included in an appropriate
analysis, (for trend, etc), the overall impact of age can be fully appreciated without any reference, as young age cannot be per se considered as a reference (in addition, the authors do not have cortisol values in younger subjects (i.e. 20-29y)).

**Level of interest:** An article of importance in its field

**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.