Author’s response to reviews

Title: Cross-sectional study of associations between normal body weight with central obesity and hyperuricemia in Japan

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Cross-sectional study of associations between normal body weight with central obesity and hyperuricemia in Japan
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Dear Mauro Lombardo
BMC Endocrine Disorders Editorial Office

Thank you for your email of 31-Oct-2019, regarding our manuscript, "Cross-sectional study of associations between normal body weight with central obesity and hyperuricemia in Japan ", and the valuable comments of the reviewer. I attach here our revised manuscript, as well as a point-by-point response to the reviewers’ comments.

We believe that the revised manuscript is a suitable response to the comments, and is significantly improved.
We trust that it is now suitable for publication in BMC Endocrine Disorders.
Thank you in advance for your kind consideration of this paper.

Yours sincerely,
We wish to express our appreciation to the Reviewer 2 for comments, which have helped us significantly improve the paper.

In accordance with the reviewer’s comments, we have revised our paper as follows;

**Reviewer 2 reports:**

1) Page 6 L 35: Please define "NW" here

In accordance with this comment, we have revised our text “Background” (Page 5)

Thus, measuring degrees of central fat distribution appear important for the early detection of health risks, even among individuals with normal weight (NW) [6].

2) Page 11 L 10: Please rewrite this phrase "The prevalences of hypertension, dyslipidemia, and diabetes in men with hyperuricemia and normouricemia were 45.2%, 66.0% and 7.2%, and 35.3%, 51.1% and 9.5%, respectively, and, 43.8%, 60.7% and 8.0%, and 28.4%, 41.0% and 3.6%, respectively, in women.". Maybe it is better separate hypertension dyslipidemia and diabetes in different phrases.

In accordance with this comment, we have revised our text “Results” (Page 10)

The prevalences of hypertension were 45.2% and 35.3% in men with hyperuricemia and normouricemia, respectively, and 43.8% and 28.4% in women with hyperuricemia and normouricemia, respectively. Those of dyslipidemia were 66.0% and 51.1% in men with hyperuricemia and normouricemia, and 60.7% and 41.0% in women with hyperuricemia and normouricemia. The prevalences of diabetes among men with hyperuricemia and normouricemia were 7.2% and 9.5%, while those among women with hyperuricemia and normouricemia were 8.0% and 3.6%.

3) Page 13 L 35: This asseveration is important: "because individuals with NWCO are considered to be of normal weight, they do not usually receive appropriate health education or prompt intervention to prevent hyperuricemia". In the same line, it is possible that the increased risk of hyperuricemia in NWCO is associated to Dietary habits of the group NWCO patients instead of the central obesity, as the authors recognize further in the discussion. I suggest performing a correlation analysis between WC and uric acid levels, if they correlate well will be stronger the conclusions independent of a causal analysis.

In accordance with this comment, we have added a sentence in our text “Discussion” (Page 12)

We found that NWCO was associated with hyperuricemia risk compared with NW, regardless of sex. Moreover, WC and uric acid levels demonstrated a positive correlation in NW and NWCO group, regardless of sex (men, r=0.19; P<0.001, women, r=0.23; P<0.001). Higher and lower BMI are associated with an increased and decreased prevalence of hyperuricemia, respectively [8].

4) Since the authors refer to the "sample size" in the text, it is important to describe the sampling
methods. If the authors evaluated the entire population or Universe of patients according the inclusion and exclusion criteria, this should be explicit in methods.

In accordance with this comment, we have revised our text “Methods” (Page 5-6)

The present study was a cross-sectional study that used the data (n=310,577) from Japanese men and women who had underwent periodic health examinations conducted by the All Japan Labor Welfare Foundation (Tokyo), between April 2013 and March 2014. The inclusion criteria were individuals aged 40-64 years and those who consented to participate in this study. The exclusion criteria were those who had missing data and who were underweight (BMI <18.5 kg/m²).

Of 310,577, 310,498 individuals consented to participate in this study, we excluded 205,730 with missing data and 7,905 who were underweight. Thus, we analyzed data from 96,863 participants (69,241 men and 27,622 women).