Reviewer's report

Title: Metabolically healthy obese and metabolic syndrome of the lean: the importance of diet quality. Analysis of MAGNETIC cohort

Version: 1 Date: 03 Dec 2019

Reviewer: Magdalena Gornicka

Reviewer's report:

This is a well-written manuscript, although has some limitations that need to be addressed prior to publication.

Title: Metabolically healthy obese and metabolic syndrome of the lean... methods and results - structure of groups didn't meet those assumptions.

Authors have classified as metabolically healthy subjects individuals without MS, but approx. 27% were overweight or obese. I have a doubt if this classification is proper. Firstly, I differently understand the criteria proposed by Buscemi et al. (ref. 2) on based whose in this study classified participants (line 112). Buscemi et al. divided participants into four groups: as normal weight or overweight-obese and also classified as MH in the presence of 0-1 and MUH if≥2 metabolic disorders, so further analysis regarded to four groups. Secondly, metabolic healthy obesity is not a "healthy" phenotype, any obesity is unhealthy and if obesity is present without the conventional cardiovascular risk factors shouldn't be classified as „healthy". Increasing evidence is now pointing that MHO individuals are at a higher risk of cardiovascular disease compared to metabolically healthy non-obese individuals, though when compared with MetS these risks are lower. Moreover, did subjects with normal weight should be classified as with MS? Thirdly, metabolic syndrome has a different definition, and in my opinion, in this study participants shouldn't be classified as subjects with MS, if they didn't meet defined MS criterias.I suggest to divide participants into four groups, and further analyze, comparing normal-weight healthy with others.

line 154:

"Anthropometric measurements: height, weight, and waist circumference", but hip circumference not mentioned, and it is need to calculate Waist-Hip Ratio (WHR).

On the other hand, according to WHO, waist circumference measurement is more practical and accurate in assessing abdominal fat content and health risk associated with abdominal obesity than WHR. Both NCEP and IDF use waist circumference measurements to diagnose abdominal obesity, and the authors have measurement of WC.
Why adiposity is treated as "other factors" (line 153), if it is base to diagnose metabolic health?

line 177:
My suggestion is to separate family history and NK

Results, line 246-248:
How can explain high physical activity as a factor associated with MS? I didn't find in discussion.

The discussion should be improved, a few statements are obvious: line 279-281; 282--283; a part statements weren't be the subjesct of this study: line 287, 291, 300. The description of the relationships with male gender and age could be more complete (line 311-316).

Authors should be consequently use the naming: who was classified as adults with metabolic abnormalites (line 281) metabolically unhealthy indiviuals (line 284), with metabolic healthy risk (line 311).

No reference to 15.

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