Reviewer’s report

Title: Relationship between metabolic syndrome and knee osteoarthritis; data from the Korean National Health and Nutrition Examination Survey (KNHANES)

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Reviewer: Rima Chedid

Reviewer’s report:

The authors investigate here the correlation between Knee Osteo Arthritis (OA) and the components of the Metabolic Syndrome (MetS) in a representative sample of the South Korean population.

The topic is relevant, thoroughly explained and the data is rich and well organized. However, the sample selection criteria are debatable to me, there are some redundancies and too many details as some parts of the article could be shortened, and the English should be revised.

Major Compulsory Revisions:

1- In the Abstract, the conclusion, especially the first sentence of it, is unclear to me. It needs to be written again.

2- In the Introduction, the last sentence of the first paragraph suggests that other factors may contribute to increased incidence of knee OA. Name some of these factors in order to link this idea to the next paragraph which immediately talks about MetS.

3- In the Patients and Methods, Data source and subjects, it is not clear why the 2001 patients who either did not respond or responded by saying “No” to the question “Have you had knee pain recently for one month or longer?” have been excluded. If OA is considered as a chronic disease, in terms of medicine, does the fact of not suffering from the knee for one month or longer exclude the positive OA diagnosis? Moreover, the question in itself is not that obvious as “recently” is opposed to “more than one month” in my opinion.

4- In the Patients and Methods, Data source and subjects, in the 797 subjects group, those who replied “Yes” and were excluded from the control subjects could have been pooled with the 634 subjects of the former group (the OA patients) who also responded “Yes” to this same question, thus increasing your sample number. Moreover, the remaining subjects who were categorized as controls should be 3100 because 3897 – 797 = 3100. How do you account for the 4 remaining subjects since the figure stated in the text is 3104?

5- In the Patients and Methods, covariates, why did you measure Blood Urine Nitrogen, Serum Creatinine, Hemoglobin, Hematocrit, Aspartate Aminotransferase and Alanine Aminotransferase? How does it relate to MetS or OA? It is not mentioned in the manuscript. Instead, if the authors still have some frozen serum left at -80 degrees C, it will be interesting to measure Uric Acid
(associated with MetS) and CRP (associated with inflammation) and see how it correlates with OA and MetS.

6- In the Discussion, the paragraph before the last one, the authors talk about much smaller numbers of male subjects with OA, not only in their study, but also in the literature as well. This idea deserves to be expanded: does OA occur more in females because of a hormonal difference, of menopause, or because of the higher muscular mass in males? How do steroids interact with inflammation caused by OA?

Minor Essential Revisions:

1- In the Abstract, avoid "longer WC". Use “high” for instance.

2- In the List of abbreviations and acronyms, be careful with the letter M which is used at the same time to indicate “month” and also to indicate “male”.

3- In the Introduction, second paragraph, second sentence “….. has rapidly increased [4]” do you mean in US adults? The sentence before the last one “Studies involving various populations are inadequate at best.” is unclear to me. In the last sentence, be careful with tenses (past or present) and avoid using the 1 and 2 figures in the text (figures have also been used twice in the text of the Discussion section).

4- In the Discussion, the last part of the second paragraph should be written in a simpler and shorter way. It is not clear from the text weather Gandhi et al. apply a common standard of BMI >30 kg/m2 to the Asian ethnicity as a whole or to all ethnicities. Moreover, there is a redundant idea in the last part of the fourth paragraph and the first part of the fifth one. Try to shorten it.

5- In the Discussion, the paragraph before the last one, there is a repetition of “current study” within one line in the first two sentences. The last sentence of this same paragraph is unclear and needs to be written again.

6- In the Discussion, the last paragraph, what does the abbreviation TKA stand for? I did not find it in the List of abbreviations and acronyms.

7-In the title, use the word "Correlation" instead of "Relation".

Discretionary Revisions:

1- Be careful, in Figure 1, it is mentioned that 4,307 subjects were excluded because of their age <40M. It should be years.

2- In Table3, no need for the * sign.

3- Try to simplify your tables which are loaded with figures, so that it becomes more reader friendly. For instance, remove the 95% CI in Table 3 and avoid the figures ratio in Table 4 as this table is the most relevant one in your results.

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
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'
Rima R. CHEDID