Reviewer’s report

Title: Evaluation of alterations in serum immunoglobulin concentrations in components of metabolic syndrome, obesity, diabetes, and dyslipidemia

Version: 0 Date: 03 Mar 2019

Reviewer: Kunming Tian

Reviewer's report:

This study evaluated the association of serum immunoglobulins A, M, G (IgA, IgM, IgG) with components of metabolic syndrome including obesity, diabetes and dyslipidemia and found that mean adjusted IgG was significantly lower in individuals with dyslipidemia from 1809 discharged patients aged 18 years or older, which was considered to represent an important step in identification of appropriate targeted treatment options for reducing cardiovascular risk by the authors. Fewer studies have examined the association of immunoglobulins with metabolic syndrome and cardiovascular disease, the study is somewhat novel and interesting, however, I have some questions below.

Major questions:

1. Study design
I thought that it was actually a cross-sectional descriptive study but not a retrospective cohort study as claimed in the abstract.

2. Population
The study population was derived from all adult patients over 18 years old who had been tested for immunoglobulins from January 2009 to January 2016 in two teaching hospitals. However, only 1,809 subjects with immunoglobulins measured were eligible for inclusion in the current cross-sectional survey, one could speculated that the immunoglobulins test rate was very low, which would resulted in serious sample selection bias and unreliable results. The immunoglobulins test conducted at the time of admission might reflected the instantaneous immunoglobulin levels in the acute phase of various diseases, thus it could not reflected the actual immunoglobulin levels.

3. Results
The analyses in generalized linear model adjusted a narrow range of covariates, as a consequence, a considerable residual confounder might cause false positive results. In the adjusted model, the authors adjusted DCI (Deyo Charlson Comorbidity Index) instead of adjusting individual comorbidities, the results after adjusting individual comorbidities should be given as sensitive analysis or supplemental tables. The results indicated the mean adjusted IgG
concentration in individuals with and without dyslipidemia was 1,095 and 1,239 mg/dL (P<0.0001), the authors should further investigated whether lower IgG concentrations would increase the odds ratios of dyslipidemia.

4. Discussion

As we know, IgA, IgM and IgG had different immunoglobulin function, however, the study only found lower IgG levels existed in patients with dyslipidemia. The authors did not discussion in detail about the potential mechanism.

Minor aspects:

1. The title, abstract and introduction claimed that the study was aimed to evaluated the associations of serum immunoglobulin concentrations with dyslipidemia, cardiometabolic disease, dyslipidemia, respectively. Actually, the study investigated the difference of immunoglobulins with components of metabolic syndrome such as obesity, diabetes and dyslipidemia.

2. In the abstract, the sentence "In this retrospective cohort study, investigators examined the association between serum Ig concentrations in order to evaluate the clinical significance of alterations on metabolic parameters" is not complete, cohesive and smooth.

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?
If not, please specify which controls are required in your comments to the authors.

No

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No
Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review? If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

**Quality of written English**

Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

**Declaration of competing interests**

Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

'I declare that I have no competing interests' below.

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal.