Reviewer's report

Title: Relationship between Diabetes and grayscale fractal dimensions of retinal vasculature among Indian population

Version: 2
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Reviewer: Edbhergue V.L. Ventura Lola Costa

Reviewer's report:

I liked the paper, despite there are some articles utilizing fractal dimension in the evaluate of the non-proliferative diabetic retinopathy and which the authors have cited there. The use of grayscale box-counting method is the differential of the work, as well, the analysis made between the alterations of retinal vasculature in diabetic patients (revealed through the fractal dimension) and the gender factor. But, I think that the your paper can better in some aspects.

Discretionary Revisions

Suggestion 1. Page 2 in Abstract (line 40 and 41) and page 3 in Background (line 95)

The authors could rectify the font size.

Suggestion 2. Page 3 (line 69) in Keywords.

The authors could add a different keyword and you could choose delete the words "retinal images" or "eye fundus image", because are similar expressions.

Suggestion 3. Page 4 in Background (line 110)

The authors could describe the meaning of acronyms CRAE and CRVE. The terms are appearing first time. The authors can see the guide for authors of BMC Ophthalmology if is necessary to make footnote to explain the acronym.

Suggestion 4. Page 6 in Methods (line 173)

The authors could identify the software provided by Soares.

Suggestion 5. Page 7 in Results (line 210)

The authors could describe the expression “confidence interval”, and after the acronym in parentheses.

Suggestion 6. Page 6 in Methods (line 167)

The acronym RIVAS already have been defined by authors, so is not necessary to put in parenthesis. The authors could write just the acronym RIVAS followed the software version.
Minor Essential Revisions

Suggestion 7. The title of paper (page 1)

The authors could replace the word "among" by "in the".

Suggestion 8. Page 2 (line 41)

The authors could improve the expression: “The purpose of this study was to identify changes on retinal vasculature of diabetic people…” instead of “…vasculature among diabetes…”

Suggestion 9. Page 3 in Background (line 81)

To improve expression: “diabetic patients” instead of “diabetes patients”.
To improve expression: to replace “among” by “in the”.

Suggestion 10. Page 4 in Background (line 115)

The authors already have written the acronym DR to replace the expression "diabetic retinopathy", so the authors must use it (to review the text).

Suggestion 11. Page 4 in Background (line 125)

The explanation about the software could be displaced to the Methods topic.

Suggestion 12. Page 5 in Methods (line 148)

The authors could describe the meaning of acronym HREC and RMIT.

Suggestion 13. Page 6 in Methods (line 184)

The authors need to define Nr.

Suggestion 14. Page 6 in Methods (line 186)

The authors could define the acronym DBC.

Suggestion 15. Page 8 in Results (line 237)

In the ultimate table, replace the name of table 5 by table 4.
The table 4 must be commented, the data inserted are not discussed.

Major Compulsory Revisions

Suggestion 16. Page 6 in Methods (line 198)

To improve the explanation in the statistical analysis: “The association of FD variations with gender in the presence of diabetic retinopathies …” So, the authors are considering that the group possess only the diabetic retinopathy, whereas, previously the authors have regarded the group of the diabetic patients
with and without the non-proliferative diabetic retinopathy.

Suggestion 17. Page 9 in Discussion (line 247)

To improve the Discussion (for instance):
- if the results support the findings of Cheung et al. (2009), the authors could comment better;
- the authors could speculate about this method of gray scale box-counting in relation to the box-counting classic;
- at last, the authors could enlarge the discussion commenting on the relationship between the fractal dimension and the diabetic retinopathy, since the article possesses necessary references.

Suggestion 18. Page 9 in Discussion (line 249)

The authors could report the numbers of diabetic peoples with and without the mild diabetic retinopathy.

Suggestion 19. Proposal to increment the article:

The authors could better the paper, making a statistical test among control group, diabetics group with RDNP (retinopathy diabetic non-proliferative) and without RDNP.

**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.