Author's response to reviews

Title: Macular retinal and choroidal thickness in unilateral amblyopia using swept-source optical coherence tomography

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Author’s response to reviews:

July 31, 2017

Dear Editors of BMC Ophthalmology:

Re: Submission ID: BOPH-D-17-00275

Please find attached a revised version of our manuscript “Macular retinal and choroidal thickness in unilateral amblyopia using swept-source optical coherence tomography”, which we would like to resubmit for publication in BMC Ophthalmology.

Your comments and those of the reviewers were highly insightful and enabled us to improve the quality of our manuscript. In the following pages are our point-by-point responses to each of the comments of the reviewers as well as your own comments.

We hope that the revisions in the manuscript and our accompanying responses will be sufficient to make our manuscript suitable for publication in BMC Ophthalmology.
We shall look forward to hearing from you at your earliest convenience.

Sincerely yours,

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RESPONSE TO REVIEWER 1:

We wish to express our appreciation for the insightful comments, which have helped us improve the manuscript.

Comment #1:

page 7 line 6th: "spherical interocular difference in refraction of less than 2.0 D", was it spherical interocular difference in refraction or spherical equivalent?, please clarified.

Response #1:

We changed it from "spherical interocular difference in refraction of less than 2.0 D" to "spherical equivalent interocular difference in refraction of less than 2.0 D".

Comment #2:

The scan length reported by SS-OCT systems in mm is calibrated to a model eye with fixed axial length. Anisometropic amblyopic eye included in the study was associated with shorter axial length than in normal controls and the fellow eye. And, as a result, shorter axial length, affects the lateral scale of all OCT data sets. For a hyperopic eye, the prediction would be measurement of greater CT due to minification relative to the model eye. To obtain accurate measurements along a lateral scale (i.e., 1.5mm, 6mm) from SS-OCT data, one must incorporate individual axial length correction (Wagner-Schuman et al IOVS 2011).

Response #2:

We corrected the lateral scale and thickness in all the SS-OCT data using individual axial length, spherical refraction, cylinder refraction, and corneal radius according to your advice. We added "The thickness from SS-OCT was corrected for magnification error using individual AL, spherical refraction, cylinder refraction, and corneal radius" to the Methods section. Along with the correction of OCT data, we revised the Tables 2–6 in the Results section and the Discussion.
RESPONSE TO REVIEWER 2:

We wish to express our appreciation for the insightful comments, which have helped us improve the manuscript.

Comment #1:

Page 4 Line 55 - The authors state that it has not been possible to use EDI imaging to measure average choroidal thickness. I believe this is likely a small grammatical error as there is an extensive literature on the topic. There are ethnic differences in EDI sensitivity, if the authors mean to reference this, please elaborate in the manuscript.

Response #1:

We replaced "However, as of yet it has not been possible to use the EDI system with SD-OCT to measure the averaged regional choroidal thickness." with "However, as of yet it has not been possible to use the EDI system with SD-OCT to measure the detailed choroidal thickness map using the 3D scan."

Comment #2:

Page 6 Line 15 - Was there any ethnic variation in the study population, this is an important factor to be added either way.

Response #2:

We added "All the subjects were Japanese" to the Results section.

Comment #3:

Page 6 Line 28 - The authors acquire refraction and axial length data for the subjects, was this used to correct for retinal magnification? This is very important especially given the significant differences in eye size in this study. I strongly suggest the authors investigate correcting their data.

Response #3:

We corrected the lateral scale and thickness in all the SS-OCT data using individual axial length, spherical refraction, cylinder refraction, and corneal radius according to your advice. We added "The thickness from SS-OCT was corrected for magnification error using individual AL, spherical refraction, cylinder refraction, and corneal radius" to the Methods section. Along with the correction of OCT data, we revised the Tables 2–6 in the Results section and the Discussion.

Comment #4-1:

Page 7 Line 34 - Can the authors quantify the exclusion criteria? Please define how poor the contrast was between the choroid and sclera to be removed?
Response #4-1:

We cannot quantify the contrast between the choroid and sclera. The exclusion criteria defined that at least one of two experienced technicians (S.A. and K.G.) judged that the segmentation used for the measurements of the retinal or choroidal thickness was impossible. The reproducibility of the judgment of the two investigators was excellent (kappa coefficient =0.88, p<0.001).

We added "The segmentation error was defined to be present if at least one of two experienced technicians (S.A. and K.G.) judged that the segmentation used for the measurements of the retinal or choroidal thickness was impossible" and "The reproducibility of the judgment for the segmentation error was determined using kappa coefficient" to the Methods section. Also, we added "The reproducibility of the judgment for the segmentation error was excellent (κ =0.88, p<0.001)" to the Results section.

Comment #4-2:

- How many scans were removed, is it possible there was unique information in this group?
What was their retinal thickness like?

Response #4-2:

We removed data from 5 amblyopes due to the poor SS-OCT image quality. These five patients were associated with severe hyperopia, and segmentation from the sclera was impossible. In contrast, the segmentation of the retinal thickness was excellent in all the cases. We added “These five patients, in whom the segmentation of choroid from sclera was impossible, were associated with severe hyperopia“ after “The study excluded 5 unilateral amblyopia patients due to the poor SS-OCT image quality”.

Comment #5-1:

Page 8 Line 8 - The sentence should read 'anisometropic AND strabismic amblyopic eyes were'

Response #5-1:

Although we searched for the sentence, we were unable to find it throughout the manuscript.

Comment #5-2:

- Given that photoreceptors serve as the initial stage of vision, it would be interesting to understand if there is any change in thickness for the photoreceptor layers.

Response #5-2:

FMT corresponds to the thickness of photoreceptor + RPE layers, but no change was found in our study.
Comment #5-3:

- In the discussion, is it that the thickened GCL+IPL may scramble the photoreceptor signal as they were not properly pruned?

Response #5-3:

We corrected the lateral scale and thickness in SS-OCT data using individual axial length, spherical refraction, cylinder refraction, and corneal radius. After the correction, we found no significant difference in the mRNFL, GCL+IPL, and GCC thicknesses among the amblyopic, fellow, and normal control eyes for all of the sectors. Based on these results, we revised the discussion.