Reviewer’s report

Title: Comparison of glaucoma diagnostic ability of ganglion cell-inner plexiform layer according to the range around the fovea

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Reviewer: Enrico Martini

Reviewer's report:

I think that this work has some interesting points that are worth to be shared with the community. The main one is that the diagnostic value of assessing ganglion cell-IP layer thickness is increased if we use a smaller zone than that is now currently used (the circular ETDRS macular grid). Nevertheless there are some flaws.

First of all the definition of glaucoma: "Glaucoma was defined as the following criteria: asymmetric cup-to-disc ratio ≥ 0.2, vertical cup-to-disc ratio > 0.7, neural rim thinning, localized notching, disc hemorrhage and RNFL defects with corresponding glaucomatous visual field (VF) defects" Structural effects are quite detailed but what is exactly a "corresponding" defect? Patients with VF defects not corresponding to structural damage were excluded? If the diagnosis of glaucoma was made almost exclusively based upon structural damage it is quite obvious that correlation with a new structural test will be high. It would be more interesting to know if GCIPL measurements were highly correlated with a diagnosis made upon "functional (VF) defects". Nothing is said on the relationship between GCIPL analysis and the visual field. Visual field data are given only to confirm that Global parameters (MD; PSD and VFI) were different between normal and glaucoma eyes.

One important consideration is that the diagnostic sensitivity of GCIPL measure in this work seems to be higher in the smaller scan zone, that corresponds to about 6-8° of visual field. So it would have been really interesting to compare the GCIPL data and the 24-2 and 10-2 visual field analysis. In the discussion at line 236 the Authors state: "Furthermore, because the GCIPL parameters in zone 1 were based on a 4 × 4 mm2 area centered on the fovea, this area also exhibited a strong relationship with visual field defects within 6 degrees of the fovea" but it is not clear if this statement is an opinion of the Authors and Whence they derived it, as no data about correlations with visual field are given.

One more problem is that the scan is not centered on the fovea and therefore especially in some eyes (tilted discs) there may be a wide variation in the measure in superior and inferior sections. The Authors correctly state that in the discussion but I think that a stronger underlining of this point should be done.

What is the usefulness of a wide scan (9x12 mm) if the best results are yielded by a 4x4 analysis? perhaps it would be better to use a smaller scan well centered on the fovea. A wide scan may be useful to acquire in the same scan the macula and the peripapillary area to analyse both ganglion cells and RNFL, but nothing is said about nerve fibre layer in this paper.

I don't completely understand why the Authors choose to limit to three and six squares the analysis per sector and didn't use the complete square (4x4 and 6x6) with 4 and 9 squares per sector instead of 3 and 6 and perhaps some motivations may be useful.
In the text is said that both groups didn't differ for sex, age, Axial length, spherical equivalent and CCT but in table 1 there is no information about sex and CCT

In the "Materials and Methods" section is described that repeated measures were obtained to assess intraobserver agreement, but in the results and in the discussion there is nothing in this regard: the Authors should expose the data and discuss it or eliminate this section in Materials and Methods

Figures 2 and 3 are quite useless as they state that in all cases there is a good agreement between the two scan patterns in more than 93% of cases. Moreover it is stated in the text that the small differences were not correlated to any parameters so I think this 2 figures may be eliminated using a table if the Authors think it is not enough to describe the results in the text.

There are some imperfections in the english translation: frequently were is used instead of was and retina instead of macula- At line 161 is written: "three groups" when there are only two.

At line 225 i think that the meaning as that when GCIPL is reduced the diagnostic ability of its measurement is increased, the english phrasing is confusing as one could understand that it is more useful to measure it where it is naturally thinner i.e. more far away from the foveal center.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
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Yes

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