

Variance in the macular sublayers' volume as a diagnostic tool for primary open angle glaucoma

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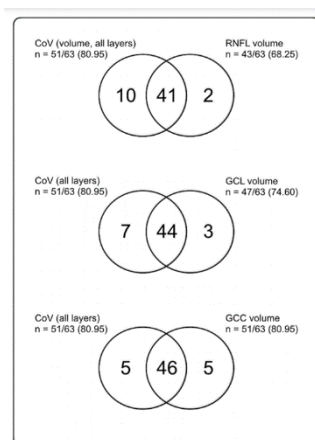
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Statement of the Problem: Glaucoma is an optic neuropathy and typically progressive if left untreated. The advent of Optical Coherence Tomography (OCT) revolutionized the diagnosis of glaucoma. In Previous studies ganglion cell complex and inner retinal layer thicknesses have excellent diagnostic accuracy for glaucoma detection. We hypothesized that glaucoma might alter the normal thickness proportion between retinal sublayers as well, and this feature might have a potential for detecting glaucoma. We assessed the variance of macular sublayers' volume in patients with glaucoma and healthy controls. We also evaluated the accuracy of this method as a possible diagnostic tool for detecting glaucoma.

Methodology: In this case-control observational study 63 cases of primary open-angle glaucoma and 57 healthy controls were included. Spectralis OCT2 was used to capture macular volumetric scans at the 6 mm ETDRS circle for each retinal sublayer. The retinal nerve fiber layer, ganglion cell layer, inner plexiform layer, inner nuclear layer, outer plexiform layer, outer nuclear layer, and outer retinal layers (external limiting membrane to the retinal pigment epithelium) were the macular sublayers included in this study. Standard deviation (SD) and coefficient of variation (CoV) of macular sublayers' volume were calculated. In order to compare each variable between groups, an unpaired Student t test (or its nonparametric equivalent) was used. The receiver operating characteristic curve (ROC) was used to investigate the discriminative ability of each parameter.

Findings: The SD (of all sublayers' volume) was greater in the glaucomatous eyes compared with controls. The same pattern was observed for CoV. The best cutoff value for the CoV was 6.712. The CoV and ganglion cell layer (GCL) volume revealed similar sensitivity (80.75) at 95% specificity for diagnosing glaucoma. The CoV detected five patients with glaucoma who had normal GCC volume.

Conclusion: Retinal sublayer variance parameters (SD, and particularly CoV) could be a viable addition to the prevailing macular OCT indices for improving glaucoma diagnosis.



Venn diagrams (at 95% specificity) showing the agreement between the CoV (all layers) vs. RNFL (top), GCL (middle), and GCC (bottom) volumes

Biography

Kiana Khatami is a medical physician who has been recently graduated from Shiraz University of Medical Sciences. She has been an active researcher in different departments of her university including Health Policy Research Center, Public Health Research Center and Poostchi Ophthalmology Research Center. Being raised in a family with an Ophthalmologist father, she has found a double interest in ophthalmology after being involved in Ophthalmology research projects in Shiraz. She hopes continuing her studies in the specialty of Ophthalmology and broadening her relationships with Community of Ophthalmologists in UK and Europe. She is honored to be a poster representator of the mentioned article published in International Journal of Ophthalmology with the permission of all other authors.

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