ABSTRACT

TITLE OF THESIS:
ANALYSIS OF RETINAL VASCULAR DENSITY USING OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY, TO DIFFERENTIATE HEALTHY, GLAUCOMA SUSPECT AND GLAUCOMATOUS EYES.

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OBJECTIVES:
To study & compare vascular density in papillary retina using OCT Angiography in normals, Glaucoma suspects (Ocular hypertension), early POAG patients and its correlation with RNFL thickness and field changes.

METHODS:
All volunteers fulfilling eligibility criteria and willing to participate in the study, were recruited in three arms (Minimum sample size of 16 each) and underwent a full ophthalmic examination and investigations (Central corneal thickness, automated visual field testing (HFA 24-2 SITA, threshold test), optical coherence tomography (OCT) RNFL thickness (3.4 mm diameter circle around disc) and OCT angiography (3x3 mm scan) of optic disc, papillary and peri-papillary areas. Quantitative analysis of vessel density was performed using the publically available, open source, ImageJ software, after background subtraction of OCTA image. Data was tabulated and analyzed using STATA.
RESULTS:

A significant relationship exists between vessel density and RNFL thinning, worsening Global indices on perimetry. Inferior RNFL thickness in O-HTN group showed statistically significant difference compared to normals (p = 0.020), which may be missed if RNFL thickness alone is seen. Papillary and peri–papillary area vessel densities had the best diagnostic accuracy to correctly differentiate normals, O-HTN and early POAG groups (AUC = 1.000). Even though a significant relationship exists between RNFL loss and decrease in vessel density, further longitudinal studies are needed to establish a temporal cause-effect relationship.

KEYWORDS:

Ocular Hypertension, Early Primary Open Angle Glaucoma, Optical coherence tomography, OCT, OCT Angiography, Vascular Density, Optic nerve head, Papillary area, Peri-papillary area.