Identifying the real state of primary open angle glaucoma by correlating visual field defects and thickness of retinal nervefiber layer in emmetropic and highly axial myopic eyes

THESIS

submitted for partial fulfillment of the

MD degree in Ophthalmology

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CAIRO-EGYPT

2015

Acknowledgement

First and foremost, Thanks to ALLAH, to whom I relate any success in achieving any work in my life.

Then, I would like to express my deepest sinceresense of gratitude, and appreciation to **Prof DrMahmoud Hamdi Ibrahim,** Professor of Ophthalmology, Faculty of Medicine, Ain Shams University. First, because the proposal of this thesis was his own idea and for his sincere encouragement ,stimulating views, careful and precious guidance,his truthful and illuminating pearls of wisdom, provision of expertise, invaluably constructive criticism , friendly advice and technical support that helped me a lot in the implementation of this work. Without his superior knowledge and experience, the thesis would not have seen the light.

I am faithfully grateful to **Dr / Lamia Salah Elewa**Assistant Professor of Ophthalmology, Faculty of Medicine, Ain Shams University, for her immeasurable patience and instructive guidance.

I would like to express my deepest gratitude for **Dr /Maged Maher** Assistant Professor of Ophthalmology, Ain Shams University, for his great and kind help in performing statistics of this thesis.

I wish to extend my thanks to all the staff members of the department of Ophthalmology, my colleagues who kindly helped me to complete this work.

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List of Abbreviations

3D	3 dimensional
AXL	Axial length
ACD	Anterior chamber depth
BCVA	Best corrected visual acuity
C/D	Cup/disc
CpRNFL	Circumpapillary RNFL
D	Diopters
dB	Decibel
GAT	Goldmannapplanantion tonometer
GCC	Ganglion cell complex
GCL	Ganglion cell layer
GHT	Glaucoma hemi field test
GON	Glaucomatous optic neuropathy
IOP	Intraocular pressure
ISNT	Inferior,superior,nasal and temporal quadrant thickness of RNFL in descending order according to thickness
NFL	Nerve fiber layer
NTG	Normal tension glaucoma
OCT	Optical coherence tomography

OD	Optic disc
OH	Ocular hypertension
POAG	Primary open angle glaucoma
PPA	Peripapillary atrophy
RGC	Retinal ganglion cell
RNFL	Retinal nerve fiber layer
RNFLT	Retinal nerve fiber layer thickness
RPE	Retinal pigment epithelium
RTVue	Software program for GCC measurement
SAP	Standard automated perimetry
SD	Spectral domain
SE	Spherical equivalent
SITA	Swedish interactive threshold algorithm
SLO	Scanning laser ophthalmoscope
SLP	Scanning laser polarimetry
TD	Time domain
VF	Visual field
MD	Mean deviation
PSD	Pattern standard deviation

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Introduction

PRIMARY OPEN-ANGLE GLAUCOM (POAG) is one of the leading causes of irreversible blindness worldwide **(Resnikoffet al.,2002**).

Glaucoma is an optic neuropathy characterized by specific and progressive injury to the optic nerve and retinal nerve fiber layer (RNFL) (**Zangwill et al., 2000).**

An objective and accurate method of quantifying this damage would enhance our understanding and treatment of this disease. The early diagnosis of RNFL changes associated with glaucoma is crucial for all patients with glaucoma. Once a visual field defect is detectable, the disease has already caused irreversible RNFL loss. Localized RNFL abnormalities have been shown to precede visual field defects earlier than other signs detected during conventional ophthalmologic examinations (**Mok et al., 2003).**

Optical coherence tomography OCT is an optical technique that permits noncontact, high-resolution, cross-sectional imaging of the posterior segments of the eye and quantitative assessment of different layers. The currently available commercial OCT unit is third generation technology, with an axial resolution of10 -μm. With this high-resolution OCT, retinal layer structures can be distinguished in precise detail (**Huang et al.,2005).**For a diagnostic instrument such as OCT to be useful in glaucoma practice, it must be capable of providing valid reproducible

results, allowing early detection of RNFL defects, and facilitating their follow-up over time. For validation, this instrument would require comparison with an existing assessment method, preferably one whose predictive value has been well documented which is the standard automated perimetry (**Sagdic et al.,2009).**

Evaluation of the relationship between anatomical structure (optic nerve and retinal nerve fiber layer and function (visual sensitivity) in glaucoma ,can aid in assessing the relative efficacy of structural and functional tests in detecting glaucomatous damage ,hence their optimal aid in deciding the target IOP(**Hood et al.,2007).**

The axial length affects the average RNFL thickness, and myopia affects the RNFL thickness distribution. High myopes are likely to exhibit different RNFL distribution patterns and thickness. Since ocular magnification significantly affects the RNFL measurement in such patients, it should be considered in diagnosing glaucoma and in deciding the target IOP (**Kang et al.,2010).**

The superotemporal and inferotemporal RNFL bundles converged temporally with increasing myopia which is associated with an increase in area of abnormal RNFL measurement. The interpretation of the RNFL thickness map in myopic eyes requires

careful consideration of the distribution pattern of the RNFL bundles (**Leung et al., 2012).**

In our cross sectional study, we are going to evaluate the effect of increased axial length on RNFL thickness, hence the defects obtained in POAG.

Aim Of The Work:

The aim of this work is to correlate the defects present in the field of vision in open angle glaucoma and thickness of retinal nerve fiber layer in emmetropic eyes and also in highly axial myopic eyes.