CORRELATION OF STRUCTURAL AND FUNCTIONAL CHANGES IN OCULAR HYPERTENSION AND EARLY GLAUCOMA

Thesis

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Walid Osama Nour El Din

LIST OF CONTENTS

LIST OF ABBREVIATIONS

Abb.	Full Term

BCVA…….. best corrected visual acuity

CCT……. central corneal thickness

C/D RATIO……. cup/disc ratio

FDT…….. frequency doubling technology

HRA……. Heidelberg retinal angiography

HRT……. Heidelberg retinal tomography

ICG…….. indocyanine green

IOP……... intraocular pressure

IQR…….. inter-quartile range

LV…… loss of variance

MD……... mean defect

MS…… mean sensitivity

OCT……. optical coherence tomography

OPC……. outpatient clinic

POAG…….. primary open angle glaucoma

RGC……… retinal ganglion cell

RNFL…….. retinal nerve fiber layer

SD……..….. standard deviation

SWAP…….. shortwave automated perimetry

LIST OF FIGURES IN REVIEW

LIST OF TABLES

LIST OF FIGURES IN RESULTS

Figure No.	Title	Page No.

LIST OF FIGURES IN RESULTS (CONT.)

Figure No.	Title	Page No.

INTRODUCTION

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Glaucoma is a progressive degenerative neuropathy. It is one of the main causes of irreversible legal blindness worldwide and more specifically the second cause of loss of vision in patients over 40 years of age in the developed countries,[1] with an important impact on quality of life.[2,3,4] In the first stages, glaucoma-induced structural alterations (apoptosis of ganglion cells, nerve fiber loss, and optic disc alteration) are asymptomatic and cannot be diagnosed clinically until functional changes are detected such as early scotomas in the visual field. It is demonstrated that 40%–50% of axonal loss may occur before any change in visual function is detected with perimetry.[5]

Ocular hypertension can be used as a generic term referring to any situation, in which intraocular pressure (IOP) is greater than 21 mmHg, the widely accepted upper limit of normal intraocular pressure in the general population. It is a condition in which the following criteria are met: IOP greater than 21 mmHg in one or both eyes, as measured by applanation tonometry on 2 or more occasions, absence of glaucomatous defects on visual-field testing, normal appearance of the optic disc and nerve fiber layer, anatomically normal & open angles on gonioscopy and

absence of ocular conditions contributing to the elevation of pressure, such as narrow angles, neovascular conditions, and uveitis.[6]

Recognition of glaucoma, in its initial stages, before variations in the visual field, permits a progressively accurate therapy with the objective of functional support and safeguarding of visual field with least damage.[7,8] There is an adequate proof that with the adequate treatment of ocular hypertension, the relative threat of switching to glaucoma is lessened by 14%, for each mmHg minimization in intraocular pressure.[9]

Optical Coherence Tomography (OCT) represents a type of imaging modality of quantitative assessment of nerve fiber thickness and optic disc parameters. It is used as a more sensitive method for detection of early structural glaucomatous nerve alterations that precede optic disc and visual field damage.[10]

Automated perimetry is a generally accepted method for monitoring visual field damage in glaucoma patients and suspects. Glaucoma patients suffer a loss of about 40% of their retinal ganglion cells before this loss is picked up on perimetry.[11]

AIM OF THE WORK

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This study aims to evaluate the relationship between the retinal nerve fiber layer thickness measurements; using optical coherence tomography, and the corresponding retinal sensitivity changes; using visual field perimetry, in cases of ocular hypertension and early glaucoma.

REVIEW OF LITERATURE