UNIVERSITI TEKNOLOGI MARA

EFFECT OF REFRACTIVE ERROR ON OPTIC DISC MEASURED BY SPECTRAL DOMAIN OPTICAL COHERENCE TOMOGRAPHY

(SD-OCT)

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AUTHOR'S DECLARATION

I hereby declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

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TABLE OF CONTENTS

ABSTRACT

Measurement of optic disc plays an important role in evaluation of optic disc nerve disease and anomalies. Accurate assessment of glaucomatous disc is very much dependent on clinical judgment of the cup-to-disc ratio. The size of the cup-to-disc ratio may be related to susceptibility to glaucoma disease. The size of cup-to-disc ratio may varied due to refractive error. Some studies showed that the size of cup-to-disc ratio is dependent on refractive error and make it hard to differentiate either it is pathological cupping or physiological cupping. Therefore, the aim of this study was to determine and compare the cup-disc ratio in three different refractive groups of children which are myope, hyperope and emmetrope. Subsequently, the association between cup-to-disc ratio measurements and refractive error was investigated. A total of 72 children comprising 24 myopes, 15 hyperopes and 32 emmetropes aged between 6 to 15 years whom met the study criteria were recruited. Topcon 3D-1000 Spectral Domain Optical Coherence Tomography (SD-OCT) was used to obtain three fundus images from each child and then manual plotting of series of dot around the margin of the cup and disc was performed on each fundus image to yield the cup-to-disc ratio measurement. The value of cup-disc ratio for each plotted fundus is auto-calculated by the OCT software. Data were tabulated and the association between cup-to-disc ratio measurements and refractive error was analyzed using analysis of variance (ANOVA) and linear regression. Results showed that there was marginally significant difference in cup-disc ratio between myopia and hyperopia ($P = 0.05$). However, there was no significant different in cup-disc ratio between hyperopia and emmetropia ($P = 0.62$) and between myopia and emmetropia ($P = 0.16$) when multiple comparison was done. The correlation of CDR with spherical equivalent (SE) showed that as SE is decreased, the CDR will increased in size ($r = -0.42$, $p<0.01$). Our result was not significant as there may be due to small sample size and different type of instruments used compared to previous study. Besides, there was biased in manual plotting of CDR by single examiner. For next research, the latest instrument of imaging might be used to have way better result when analyzing the fundus imaged and there may need more than one examiner to analyze the manual plotting of CDR.