UNIVERSITI TEKNOLOGI MARA

MACULAR THICKNESS ASSESSMENT OF HEALTHY EYE BASED ON ETHINICITY AMONG SCHOOL CHILDREN USING OPTICAL COHERENCE TOMOGRAPHY (OCT)

SITI NOR HAJAR BINTI MOHD ZULKIFLI

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AUTHOR'S DECLARATION

I declare that the work in this dissertation was carried out in accordance with the regulations of University Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This topic has not been submitted to any other academic institution or non-academic institution for any degree or qualification. In the event that my dissertation be found to violate the conditions mentioned above, I voluntarily waive the right of conferment of my degree and agree be subjected to the disciplinary rules and regulations of Universiti Teknologi MARA.

Name of Candidate   :   Siti Nor Hajar Binti Mohd Zulkifli

Student ID   :   2010280598

Programme   :   Bachelor of Optometry (Hons)

Faculty   :   Health Sciences

Thesis   :   Macular thickness assessment of healthy eye based on ethinicity among school children using optical coherence tomography (OCT)

Signature of Student :   ....

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ABSTRACT

This study examined the normal range of macular thickness in Malay, Chinese and Indian children using Spectral-Domain Optical Coherence Tomography (SD-OCT). This study comprised of sixty children recruited from several primary schools situated within 14 kilometres from UiTM Puncak Alam as the representative population of the residential area. Subjects aged between 10 and 11 were ensured to have best corrected visual acuity of 6/9 or better in either eye, have range of refractive error between +3.00 DS to -3.00DS with astigmatism ± 3.00 DC and both parents are of same races. Macular thickness among the subjects were examined according to their race. The total macular thickness for all children is recorded at 7.449μm ± 0.363 and the foveal thickness was 247.05μm ± 33.26. The foveal thickness stratified by race has shown that the Malay (250.79μm ± 38.56) and Chinese children (253.77μm ± 28.43) have almost similar thickness while Indian children have the thinnest with mean of 238.08μm ± 25.54. Though the differences of overall total macular volume between races is not significant, it was found out that there are dissimilarities in macular thickness structurally, thus suggests that race (Malay, Chinese and Indian) and macular thickness is interrelated. It is strongly recommended that further research can be carried out on larger samples to get more accurate results.

CHAPTER 1

INTRODUCTION

1.1 Research Background

Pathologic processes involving the macula such as glaucoma, macular hole, and macular edema, can profoundly influence vision. Macular is an oval-shaped pigmented area at the center of the retina. It is approximately 5.5 mm in diameter where its center is approximately 3.5mm lateral and 1mm inferior to the optic disc. The macular appears as a darkened region in central retina and may seem to have a yellow hue because of thereflection from the yellow screening pigments, the xanthaphyll carotenoids zeaxanthin and lutein. These pigments function as filter to reduce chromatic aberration and may also have antioxidant effect suggesting a protective role against the UV radiation damage.

In many clinical situations, knowledge of the macular thickness in comparison to population or normal values and their variation with demographic and ocular variables is an essential aid in the diagnosis and monitoring of disease severity or progression. Wide-angle fundus photographs, confocal scanner laser tomography, and scanning laser polarimetry are among the conventional means used when evaluating the macula however it can only provide qualitative information.

As childhood severe visual impairment is not a rarity these days, it is increasingly important to detect the impairment in macular or retina at the early stage. Children with glaucoma or any other type of progressive optic neuropathy are more difficult to diagnose and to monitor for disease progression than adults because of challenging in obtaining reliable and reproducible visual field and intraocular pressures. A database on the thickness of macular between races may help health practitioners to come out with necessary arrangement on how to remedy their patients especially children. Malaysia is a country with several ethnicities comprising Malays, Chinese, Indians and other