CHAPTER II

2. REVIEW OF RELATED LITERATURE

2.1 Ethnic Differences in Optic Disc Parameters

Beck et al[51] evaluated stereoscopic photographs taken from 100 Black and 100 White volunteers and estimated horizontal, vertical, and average cup-to-disc ratios. They showed that Blacks had greater cup-to-disc ratios than Whites. Chi et al[52] compared the optic discs from 30 Black and 30 White volunteers using an optic disc analyzer and found that Blacks had larger disc areas, larger cup-to-disc ratios, and similar neural rim areas. Histologic measurements of the optic disc in normal eye bank eyes from 24 Blacks and 36 Whites showed that Blacks had greater vertical optic disc diameters than Whites but similar horizontal diameters.[53] Evidence of ethnic differences in optic nerve head topography using digitized image analysis with stereoscopic disc photographs from a population-based survey; the Baltimore Eye Survey, was reported by Varma et al.[34] They analyzed 2,903 eyes from Blacks and 3,475 eyes from Whites and found that Blacks had significant larger disc areas (12% larger than that of Whites), larger cup areas, larger cup-to-disc ratios.

Evidence of ethnic differences in optic disc topography using the HRT was reported by Tsai et al. [33] This is the only report that include Asian subjects. They studied 180 normal subjects in whom 43 were Blacks, 45 were Asian, 48 were Hispanic and 44 were Whites, with age 19-40 years. They found that disc area, cup volume, maximal cup depth, and vertical cup-disc ratio were largest in Blacks, intermediate in Asians and Hispanics, and smallest in Whites. However, they defined Asian as Asian-born or first-, second- or third-generation Asian American. To our knowledge there is no report about optic disc topography in normal subjects for pure Asian ethnic group especially Southeast Asian.

2.2 Glaucoma Diagnosis and Ethnic Groups

Several investigators concluded that race-specific normative data of topographic optic disc parameters are essential in the diagnosis of glaucoma.[4, 33, 34] Weinreb[4] in his recent editorial article about assessment of optic disc topography for diagnosing and monitoring glaucoma had emphasized the need of race-specific normative data.

2.3 Age and Optic Disc Parameters

Contradictory results had been reported concerning relationship of age and optic disc parameters. Some clinical studies have detected no age-related differences in the optic disc[35-38], while other investigators have found age-related differences.[39-42] These were all clinic-based studies and their generalizability is unclear. The population-based studies like the Ferndale[43], Framingham[44], and Baltimore[34] eye study did not find any significant relationship between age and size of the cup or the cup-to-disc ratio. However, some histologic studies have shown an annual loss of 4,000 to 12,000 nerve fibers per year.[45-48] But Repka and Quigley[49] and

Johnson et al[50] found no statistically significant decrease in the number of nerve fibers with age. In summary, there are still controversies about relationships of age and optic disc parameters. It would be interesting to see if there is any relationship of age and optic disc topography in Thai subject.