Interocular asymmetry in choroidal thickness in healthy Indian population using swept-source optical coherence tomography

Dear Sir,

The assessment of choroidal thickness (CT) is of paramount importance in diagnosis and management of various ocular disorders. The inter-ocular asymmetry in CT should be kept in mind while analyzing the results of different studies. The authors had previously reported the normative data for sub-foveal CT (SFCT) in 119 healthy Indian patients (age 19–45 years, refractive error −6 to +4 diopters, best corrected visual acuity 20/20) using swept-source optical coherence tomography (SS-OCT, DRI-OCT, Topcon Japan).[1] The CT was further compared between the fellow eyes in different regions of the macular area based on the ETDRS (early treatment diabetic retinopathy study) grid.

The mean CT in the right eye was significantly greater than the left eye in all EDTRS regions except the temporal inner and outer regions [see Table 1], with the maximum difference in the nasal outer region (mean 14.39 µm, $P = 0.0001$, Student t test). The individual difference in the subfoveal CT (SFCT) between the right and left eye ranged from +133 to −125 µm. The SFCT was greater in the right eye as compared to left eye in 59% of the cases ($n = 70$).

The inter-ocular asymmetry in CT may arise from the difference in ocular blood flow. The right ophthalmic artery receives blood from the brachiocephalic trunk which itself is more proximal to the left ventricle than the left common carotid artery which branches into the left ophthalmic artery.[2] The reason for maximum difference in the nasal macular region is not clearly understood. We hypothesize dominance of 1 eye in an individual to have some contribution to the asymmetry but this could not be confirmed retrospectively as this was a cross sectional study.

Similar inter-ocular differences in CT have been previously reported in Caucasian and Middle-Eastern patients using enhanced depth spectral domain OCT (SD-OCT).[3-5] As SS-OCT provides a better delineation of the CSI than SD-OCT, it may be superior in evaluating the CT. Ruiz-Medrano *et al*. had used SS-OCT for studying the inter-ocular CT difference in Spanish population.[2] The present study is the first to report the inter-ocular asymmetry in CT on SS-OCT in the Indian population.

Table 1: Details of mean choroidal thickness (in microns) in all 9 ETDRS zones; comparison of right and left eyes (mean±1SD)

	CT (R)	CT (L)	D
CSF	302.94±65.49	295.26±65.77	7.68±47.90 (P=0.0829)
NIM	288.37±64.46	277.02±67.19	11.35±45.24 (P=0.0072)
NOM	249.18±66.05	234.78±68.08	14.39±39.34 (P=0.0001)
TIM	293.59±63.84	295.21±59.51	-1.63±46.27 (P=0.7014)
TOM	280.78±60.60	282.48±58.22	-1.70±43.56 (P=0.6700)
SIM	311.64±68.27	299.02±62.03	12.63±50.71 (P=0.0076)
SOM	310.17±63.78	299.24±55.60	10.92±46.78 (P=0.0121)
IIM	300.721±72.63	296.22±68.45	4.50±52.22 (P=0.3487)
IOM	289.53±70.05	283.47±69.11	6.05±47.33 (P=0.1652)

(CT- choroidal thickness, R- right eye, L- left eye, D- difference between right and left (R-L), CSF- central subfoveal, NIM- nasal inner macula, NOM- nasal outer macula, TIM- temporal inner macula, TOM- temporal outer macula, SIM- superior inner macula, SOM- superior outer macula, IIM- inferior inner macula, IOM- inferior outer macula)

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Conflicts of interest

There are no conflicts of interest.

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