Variations in normative foveal morphology SD‑OCT data: A study of White, South Asian and Black ethnicities

I. Ctori & B. Huntjens

Purpose: Foveal morphology shows significant inter-individual variation and ethnicity may play a role. We investigated variations in specific retinal layer thickness and foveal width in three ethnic groups.

Methods: We recruited 226 healthy volunteers age 18 to 39 years (76 white, 80 South Asian and 70 black; male to female ratio 1:2 per ethnic group). Foveal thickness including inner retinal layer (IRL), outer nuclear layer (ONL), photoreceptor layer (PRL), retinal pigment epithelium (RPE), foveal width and foveal pit depth (FPD) were taken from Spectralis (Heidelberg, Germany) SD-OCT scans. Retinal layer thickness measurements were taken from 0º to 3.8º eccentricity from the fovea. Two-way ANCOVA evaluated the impact of ethnicity and gender confounders on foveal morphology parameters, while controlling for refractive error.

Results: White subjects had thicker central IRL (130±21µm) than South Asian (123±16µm) and blacks (116±14µm; $F(2)=12.4$, $p<0.0005$). This was also true for ONL ($p<0.0005$) and PRL ($p=0.03$), but not for RPE ($p=0.31$). We report similar findings for thickness comparisons up to 4º retinal eccentricity. Foveal width was narrower in whites (2226±261µm) compared to South Asian (2417±273µm) and blacks (2300±223µm; $F(2)=10.0$, $p<0.0005$). Ethnicity explained around 12% of the variance in IRL and foveal width, while gender played no significant role ($p>0.05$). The depth of the foveal pit was significantly shallower in white (120±25µm) and South Asian (121±18µm) than blacks (129±17µm, $F(2)=4.8$, $p<0.009$), with no significant effect of gender ($p=0.39$).

Conclusion: The overall foveal pit profile significantly varies with ethnicity. Our results indicate that ethnicity explains more of the variation in foveal morphology than gender.