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Abstract

Purpose To investigate the relationship of foveal architecture with macular pigment optical density (MPOD) and its spatial profile in south Asian and white females.

Methods Foveal anatomy measurements, obtained using optical coherence tomography (Spectralis OCT; Heidelberg), were collected from 46 south Asian (age 21 ± 3 years) and 38 white healthy females (age 26 ± 5 years). Spatial distribution of MPOD, measured by heterochromatic flicker photometry, was classified as a typical exponential or an atypical profile.

Results South Asian compared to white females had thinner central retinas ($220 \pm 14\mu\text{m}$ vs. $228 \pm 19\mu\text{m}$; $P = 0.02$), wider foveas ($2526 \pm 247\mu\text{m}$ vs. $2296 \pm 228\mu\text{m}$; $P < 0.0005$) and higher central MPOD (0.56 ± 0.18 vs. 0.44 ± 0.23 ; $P = 0.001$), after controlling for age. Central MPOD was greater in those with an atypical (0.61 ± 0.21) compared to a typical MPOD profile (0.47 ± 0.17 , $P < 0.005$). Only white females presenting a typical MPOD profile showed a significant correlation between central MPOD and central retinal thickness ($\rho = 0.403$, $P = 0.03$) and between the foveal pit and MPOD profile slope gradients from 0 to 0.8° ($r = -0.522$, $P = 0.004$). We found no association between foveal width and central MPOD in either ethnicity regardless of MPOD profile type ($P = 0.90$).

Conclusion Our findings show that there are significant differences in retinal morphology and central MPOD between south Asian and white females. However, foveal anatomy seems to correlate with central MPOD only in white females with typical MPOD profiles. We hypothesize

that higher central MPOD associated with atypical MPOD profiles and south Asian ethnicity is not related to central foveal anatomy, but a feature of an individual's congenital constitution.