Purpose: : The extent to which reduced macular pigment optical density (MPOD) contributes to the prevalence of age related macular degeneration (ARMD) in Caucasians compared to other ethnicities has often been questioned. Foveal architecture may be related to MPOD levels and hence be a contributing factor. Previous studies have reported race-linked differences in peak MPOD and its central spatial distribution. This study investigates the relationship between MPOD and foveal architecture in an adult Asian population.

Methods: : The spatial profile of MPOD was assessed in 55 healthy Asian subjects (mean age 21 ± 4 years) using heterochromatic flicker photometry (*Ophthalmic Physiol Opt. 30:470-483,2010*). High-resolution macular thickness maps were obtained using a spectral-domain optical coherence tomography (Spectralis OCT, Heidelberg, Germany). The following relationships were investigated: 1) Peak MPOD (at 0° eccentricity) and minimal foveal thickness (MFT) measured manually at the point of sharpest foveal reflex; 2) Peak MPOD and central foveal thickness (CFT: average retinal thickness within central 1mm circle of the ETDRS grid); 3) Peak MPOD and foveal width (FW: measured from crest to crest); 4) MFT and FW; 5) Average MPOD (ODav: over an area subtending ±2.8° centred at the fovea) and FW; and 6) ODav and CFT.

Results: : The peak MPOD values (mean 0.56 ± 0.17 log units) and the corresponding MFT showed good correlation (R^2 = 0.34 $p<0.0005$). A weaker correlation was found between peak MPOD and CFT (R^2 = 0.12; p=0.01). A moderately significant negative correlation was found between FW and CFT (R^2 = 0.22; $p<0.0005$) and between FW and MFT (R^2 = 0.1; p=0.03). In contrast, no correlation was found between FW and peak MPOD at 0° (p=0.84), ODav and FW (p=0.41), or ODav and CFT (p=0.59).

Conclusions: : The current findings suggest that minimal foveal thickness (measured manually at the point of sharpest foveal reflex) is a better predictor value for MPOD compared to the central foveal thickness given by the OCT. The expectation that a wider foveal width may contain more macular pigment because of longer cone axon fibres is not supported by our findings in the Asian subject group. Our results suggest that differences in foveal architecture can explain some of the measured variations in MPOD.