Variations of macular pigment optical density with axial length and foveal choroidal thickness in young Hong Kong Chinese

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Purpose:

To investigate the variations of macular pigment optical density (MPOD) with axial length (AL) and foveal choroidal thickness (ChT) in healthy young Hong Kong Chinese.

Methods:

Forty-five healthy Chinese adults, aged 18-33 years old, were recruited. All subjects were free from color vision deficiency and ocular abnormalities. MPOD was determined by Macular Pigment Screener (MPS II, Elektron Technology) using standard test mode. AL was measured by IOL Master (Carl Zeiss Meditec). ChT was determined by manual segmentation of the retinal images from spectral-domain optical coherence tomography (Spectralist, Heidelberg Engineering). Only the data from the right eyes were reported and used for data analysis.

Results:

The mean MPOD was 0.64 ± 0.14 (ranged 0.27 to 0.96). The mean AL was 25.23 ± 1.08 mm (ranged 23.33 to 27.36 mm). The mean foveal ChT was 253 ± 57 um (ranged 141 to 387 um). The mean spherical equivalent refractive error was -3.92 ± 2.97 D (ranged +1.00 to -10.00 D). Results from multiple linear regression did not show any significant correlation among MPOD, AL and ChT (p = 0.316). However, MPOD and AL showed a polynomial distribution in which MPOD increased with AL up to 25.5 mm and then dropped beyond this value (adjusted R square = 0.154, p = 0.011).

Conclusions:

MPOD showed significant polynomial distribution with AL in young Hong Kong Chinese, but not with foveal ChT. For the subjects with AL shorter than 25.5 mm, MPOD increased with AL. In contrast, for the myopes with AL beyond 25.5 mm, MPOD decreased with AL.

Keywords:
Macular pigment optical density, axial length, choroidal thickness, myopia