
Comment on choroidal thickness in high-altitude sickness

Dear Sir,

We read with interest the article by Hirukawa-Nakayama *et al.* describing an interesting case of high-altitude retinopathy in a young healthy male.^[1] The authors concluded that this patient's subfoveal choroidal thickness of 530 μm OD and 490 μm OS was thicker than normal by comparing these values with the mean subfoveal choroidal thickness of approximately 300 μm that has been described in healthy individuals. The authors suggested that this may be due to an increase in choroidal blood flow from hypoxia.

While it is possible that this patient's choroidal thicknesses were thickened bilaterally, we would like to advise caution in

the interpretation of choroidal thickness data in light of recent articles published in the literature. In a study on the topographic variation of choroidal thickness at the macula of 124 healthy Chinese adults,^[2] the mean central subfield choroidal thickness was 322.2 μm . This paper, however, demonstrated a wide range of values for choroidal thickness (both central subfield as well as other sectors of the Early Treatment Diabetic Retinopathy Study grid) which varied according to the refractive status of the subject. The mean central subfield choroidal thickness for high myopes was 253.8 μm (standard deviation [SD] ± 71.0), while the mean thickness was 457.4 μm (SD ± 64.1) for emmetropes. Therefore, choroidal thickness in the patient (36 year old healthy emmetrope) presented by Hirukawa-Nakayama *et al.* may not be significantly thickened, considering the refractive status of that patient.

Besides the effect of age and refractive status on choroidal thickness,^[3,4] diurnal variation is also an important factor to consider when studying choroidal thickness.^[5] The mean amplitude of diurnal variation has been reported to be 33.7 μm (range: 10.5–43.1 μm).^[5] Therefore, it is important to consider the time of the day when the optical coherence tomography scans were taken.

Like the authors, we believe that the choroid, having an integral role in the normal physiology of the eye, is important in the pathogenesis of diseases. Studying the choroid may give us better understanding of disease processes. However, there are many factors that affect choroidal thickness, and we need to be wary of these factors when interpreting choroidal thickness data. There is also a paucity of population normative choroidal thickness database accounting for these factors in the current literature for us to compare perceived pathologic values against.

In conclusion, we would like to congratulate the authors for their thought invoking article describing choroidal thickness relationship with high-altitude sickness, and we hope further studies on the choroid add to our understanding of disease pathogenesis.

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