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The consistency of retinal image size measurement using smartphone application (Article)

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Abstract

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Introduction: Unequal retinal image size (RIS) or aniseikonia is usually related with anisometropia. Higher differences of RIS may manifest symptoms such as dizziness, headache or disorientation. In worst case might cause suppression that leads to amblyopia. Current study aims to evaluate the consistency of aniseikonia measurement in Smart Optometry smartphone application among myopic, hyperopic, and astigmatic simulated anisometropia and real anisometropia groups. Methods: Fifteen real anisometropes (refractive error; -0.50 until -6.00 diopters; D) and fifteen emmetropes (refractive error: -0.25 until +0.50D) were recruited. Real anisometropes wore their habitual spectacle correction while each emmetropes were fitted using soft contact lenses of +4.00DS, -4.00DS and -4.00DC with base curve 8.6 and total diameter 14.2mm in random order to mimic myopic-, hyperopic- and astigmatic-anisometropia before testing. Participants with any ocular disease and binocular vision problem were excluded. The consistency of aniseikonia measurement was determined in two visits, separated by at least 24-hour interval. Three repetitive measurements were taken in each visit. Results: Independent t-test and paired t-test showed that real and simulated anisometropia gave insignificant aniseikonia percentage, p>0.05. ICC findings revealed moderate-to-good agreement for all simulated and real groups. Bland Altman analysis between two visits exhibited good agreement among all simulated group; myopic (mean difference 0.2047; 95%CI:-1.1386-1.549), hyperopic (mean difference 0.2200; 95%CI:-0.9286-1.3686) and astigmatic (mean difference 0.2533; 95%CI:-0.7114-1.2180). Real anisometropes demonstrated good agreement with bias value of 0.2247(95%CI:-0.9162-1.3656) using Bland Altman plot. Conclusion: Smart Optometry application provides consistent measurement of aniseikonia regardless any types of anisometropia.

SciVal Topic Prominence

Topic: Aniseikonia | Epiretinal Membrane | Diplopia

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