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Ocular biometry components and their interrelationship in different refractive error group among Indian school children

Uma Mageswari Batumalai, Indira Madhavan, Fakruddin Shamseer Barodawala and Azrin Esmady Ariffin
SEGi University, Malaysia

Statement of the Problem: There are few population-based age norms for refraction and ocular biometry is available, particularly for children. For the past two decades, comprehensive sets of data on refraction and ocular biometry have been compiled, using modern measurement techniques, only on populations of children of Chinese origin where the populations are characterized by a high prevalence of myopia. However, studies on Indian children are scarce. Despite the limitations of existing data on children, the following picture of the relationship between refractive error and ocular biometry has emerged. Present study is the result of analysis of the biometric data investigating the refractive components of the eye in Indian school children.

Methodology & Theoretical Orientation: A cross-sectional study on Indian school children aged 7 to 11 years old. Total 86 subjects were recruited for the study. Biometric components including corneal curvature, axial length and central corneal thickness were measured. Cycloplegic refraction was performed on all subjects.

Findings: Paired-t test showed that there is no significant difference in biometric components between boys and girls ($p>0.05$). Pearson correlation coefficients showed the highest correlation between refractive error and axial length ($r=-0.64$) which indicates an association of greater axial length with more myopic refractive error. It was also found an association of flatter corneal curvature ($r=+0.44$) and thicker central corneal ($r=+0.23$) with more hyperopic refractive error.

Conclusion & Significance: Ocular refraction is correlated not only with axial length, to a lesser extent, corneal curvature and corneal thickness. It can be concluded that the refractive error of the eye to be a multifactorial condition involving a complex relationship between the cornea and the length of the eye. Changes in the anterior segments as the eyeball elongates in myopia progression included steeper corneal curvature and decreased central corneal thickness.

umabatumalai@segi.edu.my