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A Three-Dimensional-reconstruction-based study on the ocular volume of Chinese children with high myopia

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Highly myopic eyes differ in morphology from emmetropic eyes, and the correct estimation of the vitreous volume is difficult. To explore an effective method to estimate ocular volume using refractive factors in children. Methods: This is a retrospective study of children with high myopia who visited the Shenzhen Shekou People's Hospital (July-December 2018) before undergoing posterior scleral reinforcement surgery. Data on refractive factors and ocular 3D reconstruction imaging based on high-end CT were collected for linear correlation and linear regression analyses.

Results: Ten patients (20 eyes) were included. There are nine males and one female. They were 4 to 12 years of age. The spherical equivalent ranges from +0.25 to -20.00 D. The cylindrical equivalent ranges from -0.50 to -6.25 D. The AL (axial length, AL) ranges from 21.78 to 33.90 mm. The corneal curvature (mean) ranges from 42.44 to 46.75. The 3D reconstruction of the CT images shows that the ocular volume ranges from 4.591 to 10.988 ml. The ocular volume of the 20 eyes decreases with the increase of diopter and total curvature, both presenting a linear trend, with the Pearson correlation coefficients being -0.776 (P<0.001) and -0.633 (P=0.003), respectively. The ocular volume of the 20 eyes increases with the increasing AL, also presenting a linear trend, with the Pearson correlation coefficient being 0.939 (P<0.001).

Conclusions: In children, the ocular volume is negatively and linearly correlated with the diopter and curvature, and positively and linearly correlated with the AL.

Recent Publications

1. Jiang X, Zhou Y, Ke P, Bao X, Wu H, Xia Y, Zhang Z, Zhong H, Dai Q, Wu L, Wang T, Lin M, Li Y, ang Q, Lu Y, Zhong X, Han M, Gao J. Peptide nano-blanket impedes fibroblasts activation and subsequent formation of pre-metastatic niche, 2022 May 25;13(1):2906. Doi: 10.1038/s41467-022-30634-8.

2. Xin Jiang, YuShuang Xu, LiNa Xiong, YaNan Li, ZhiFan Xiong- Diagnostic methods and drug therapies in patients with ischemic colitis, 2021 Jan;36(1):47-56. Doi: 10.1007/s00384-020-03739-z. Epub 2020 Sep 16.

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