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Letter to Editor

Extent of Refractive Error Changes with Axial Length Elongation

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Spherical Refractive error (Rx) has been reported to be reliably estimated with Ocular Biometrics (OB) using intra-ocular lens calculation method such as SRK/T formula [1]. Further supplementary data was presented regarding the evaluation of the extent of Rx alterations with Axial Length (AL) elongation using this calculation method.

Rx were calculated using intraocular lens power (IOL) (22.5D A-Constant 118) and various AL (23.0 to 26.0 mm) and corneal curvature (K) readings (41.00 to 44.00 D) using SRK/T formula. IOL was estimated with Rx (Plano), AL (23.2 mm) and K reading (42.00 D).

RX	AL (mm)	23.0	23.5	24.0	24.5	25.0	25.5	26.0
K (D)	**41.0**	+1.21	+0.16	-0.89	-1.93	-2.97	-4.00	-5.03
	41.5	+0.86	-0.25	-1.27	-2.32	-3.38	-4.42	-5.46
	42.0	+0.51	-0.57	-1.65	-2.72	-3.79	-4.85	-5.99
	42.5	+0.15	-0.95	-2.04	-3.13	-4.36	-5.50	-6.63
	43.0	-0.25	-1.33	-2.44	-3.54	-4.75	-5.89	-7.02
	43.5	-0.59	-1.72	-2.84	-3.95	-5.06	-6.26	-7.40
	44.0	-0.97	-2.11	-3.25	-4.37	-5.50	-6.63	-7.76

Table 1: Rx was estimated by various AL and K readings with IOL (22.5 D A-constant 118).

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RX Changes	AL (mm) Changes	23.0-23.5	23.5-24.0	24.0-24.5	24.5-25.0	25.0-25.5	25.5-26.0	MEAN (SD)
K (D)	**41.0**	-1.05	-1.05	-1.04	-1.04	-1.03	-1.03	-1.04 (0.01)
	41.5	-1.11	-1.02	-1.05	-1.06	-1.04	-1.04	-1.05 (0.03)
	42.0	-1.08	-1.08	-1.07	-1.07	-1.06	-1.14	-1.08 (0.03)
	42.5	-1.10	-1.09	-1.09	-1.23	-1.14	-1.13	-1.13 (0.05)
	43.0	-1.11	-1.11	-1.10	-1.20	-1.15	-1.13	-1.13 (0.04)
	43.5	-1.13	-1.12	-1.11	-1.11	-1.20	-1.14	-1.14 (0.03)
	44.0	-1.14	-1.14	-1.12	-1.13	-1.13	-1.13	-1.13 (0.01)
	Mean (SD)	-1.10 (0.03)	-1.09 (0.04)	-1.08 (0.03)	-1.12 (0.07)	-1.11 (0.06)	-1.11 (0.05)	

Table 2: Rx alterations with 0.5 mm AL increase at various K readings.

In Table 1, estimated Rx with various AL and K readings would only be regarded as clinical reference, not actual Rx, since only artificial lens power was used for calculation. Various human lens powers would likely result in different Rx outcomes. However the main objective of this letter was to estimate the extent of Rx alterations with AL elongation. In Table 2, interestedly it showed similar amount of Rx alterations, i.e. approximately -1.10 D Rx increase with 0.50 mm AL elongation between 23 to 26 mm AL. Comparable extent of Rx alteration was found among various K readings (41.00 to 44.00 D), but Rx tends to increase a bit more with higher K readings.

Conflict of Interest

The authors did not report any potential conflicts of interest in research, authorship and/or publication of this article.

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