Relationship Between Age, Axial Length, Anterior Chamber Depth, Corneal Steepness, and Corneal Thickness

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Purpose

- To evaluate the relationship between the age, axial length, anterior chamber depth, corneal steepness and corneal thickness.

Methods

- Medical records of 440 patients (440 eyes) who underwent cataract surgery at Kong Eye Center were reviewed.

- Data including age and ocular parameters including axial length (AL), anterior chamber depth(ACD), corneal steepness (mean K) and central corneal thickness (CCT) were collected and analyzed using univariate and multivariate analyses.

Results

- Demographic data
  - Mean age 66.3 ± 11.2 yr (range 21 – 93)

- Univariate analysis showed increased age has significant correlation with shorter AL (P<0.001) and shorter ACD (P<0.001), increased CCT (P=0.027) and mean K (P <0.001).

- Increased CCT has significant correlation only with increased age (P<0.027).

- Increased ACD showed significant correlation with younger age (P<0.001), decreased mean K (P=0.003) and increased AL (P<0.001)

- Increased mean K has significant correlation with older age (P<0.001), decreased ACD (P=0.003) and decreased AL (P<0.001)

- Increased AL has significant correlation with younger age (P<0.001), decreased mean K (P<0.001) and increased ACD (P<0.001).

Univariate analysis

		Age	CCT	Mean K	ACD	AL
Age	correlation coefficient*	1	0.106	0.242	-0.513	-0.412
	P value		0.027	<0.001	<0.001	<0.001
CCT	correlation coefficient	0.106	1	-0.040	0.038	0.072
	P value	0.027		0.406	0.425	0.135
Mean K	correlation coefficient	0.242	-0.040	1	-0.141	-0.503
	P value	<0.001	0.406		0.003	<0.001
ACD	correlation coefficient	-0.513	0.038	-0.141	1	0.518
	P value	<0.001	0.425	0.003		<0.001
AL	correlation coefficient	-0.412	0.072	-0.503	0.518	1
	P value	<0.001	0.135	<0.001	<0.001	

Stratification of the parameters according to age groups.

Age group	CCT	Mean K	ACD	AL
0-39 (n=8)	537.4 ± 36.3	43.73 ± 1.83	3.66 ± 0.73	24.41 ± 0.83
40-49 (n=27)	568.1 ± 35.6	44.18 ± 1.49	3.67 ± 0.40	24.55 ± 1.02
50-59 (n=81)	569.9 ± 39.2	44.60 ± 1.51	3.32 ± 0.47	23.77 ± 0.90
60-69 (n=133)	567.9 ± 35.4	45.03 ± 1.65	3.10 ± 0.44	23.47 ± 0.99
70-79 (n=151)	570.7 ± 47.5	45.40 ± 1.95	2.87 ± 0.45	23.10 ± 0.79
≥ 80 (n=40)	583.1 ± 34.3	45.47 ± 2.10	2.70 ± 0.30	22.99 ± 0.63
Total (n= 440)	570.0 ± 40.8	45.04 ± 1.81	3.07 ± 0.51	23.44 ± 0.97
F value	1.917	4.849	29.630	19.455
P value	0.09	<0.001	<0.001	<0.001

- All data are expressed as mean ± SD.

Multivariate analysis

- Multivariate analysis revealed that increased age has significant correlation with decreased anterior chamber depth ($P<0.001$), decreased axial length (<0.001).

  - Mean K tended to increase with increasing age, but the correlation was not statistically significant ($P =0.092$).

- Increased AL significantly related to increased ACD ($P<0.001$) and decreased mean K ($P = 0.001$).

Conclusions

- Increased age has significant association with decreased axial length and decreased anterior chamber depth.

- Increased axial length has significant correlation with increased anterior chamber depth and decreased corneal steepness.

Thank you for your attention!