

# THE CORRELATION BETWEEN THE SEVERITY OF KERATOCONUS AND INTRAOCULAR PRESSURE CHANGE AFTER CORNEAL COLLAGEN CROSS LINKING PROCEDURE FOR TREATMENT OF KERATOCONUS

Khaled Sameh Nabwi, Amr Ahmed Said, Manal Zakaria Abdelzaher Abdelrehim  
Department of Ophthalmology, Faculty of Medicine, Alexandria University

## INTRODUCTION

Keratoconus (KC) is a progressive non inflammatory bilateral (but usually asymmetric) ectatic corneal disease characterized by stromal weakening and paraxial thinning that results in disruption of the corneal surface. Visual loss occurs due to irregular astigmatism and myopia, and due to secondary causes as corneal scarring. The reported incidence ranges from 1.3 to 25 per 100,000 per year across different populations ,and a prevalence of 8.8-229 per 100,000

Keratoconus could be associated by several diseases such as connective tissue disorders and has a potential association with Ehlers-Danlos'& Floppy eyelid syndromes as well as vernal keratoconjunctivitis. genetic predisposition along with the environmental factors are required to trigger progressive keratoconus.

The condition often first manifests within the second decade of life, whereas some conditions might appear in adolescence. The disease worsens over time and typically stabilises by the 4th decade of life.

anterior segment imaging techniques have been progressed quickly. Those techniques have significantly improved the understanding and criteria of the anatomic as well as the physiologic alterations that happen in keratoconus disease progression.

## AIM OF THE WORK

This work aimed at studying the correlation between the severity of Keratoconus (thinnest pachymetry and mean K) and the intraocular pressure after CXL procedure using riboflavin in addition to UVA rays.

## PATIENTS AND METHODS

### PATIENTS:

This prospective clinical study enrolled 50 eyes of 28 patients with KC, who underwent corneal CXL induced by riboflavin and UVA in one or both eyes.

**Inclusion criteria, Exclusion criteria.**

### METHODS:

*All patients will undergo standardized ophthalmic examination before CXL comprising of:*

- 1-Visual acuity
- 2-Slit lamp examination
- 3-Corneal topography by pantacam (WaveLight Oculyzer)
- 4-IOP measurement by Goldmann applanation tonometry

Tonometry Measurement: Following the administration of anaesthetic eyedrops (Benox; Eipico), tonometry measurements were taken using goldmann applanation tonometry and sterile sodium fluorescein strips.at the cornea's centre. Tonometry readings were taken (before and after CXL).Corneal topography, TCT, and Km readings (Pentacam) were Examined and recorded. The GAT measurements, TCT, and Km measurements before surgery as well as IOP measurements at 1 week and 1 month postoperatively were included in the statistical analysis.

## RESULTS

**Table 1:** Comparison between the different studied periods based on IOP in total sample (n = 50)

	IOP (mmHg)			F	p
	Preoperative	After 1 week	After 1 month		
Range	10.0 – 19.0	10.0 – 20.0	11.0 – 21.0	230.370*	<0.001*
Mean ± SD.	13.62 ± 2.59	14.38 ± 2.73	15.44 ± 2.83		
Median (IQR)	13.0 (12.0 – 16.0)	14.0 (12.0 – 17.0)	15.0 (13.0 – 18.0)		
Sig. bet. periods.	p <sub>1</sub> <0.001*, p <sub>2</sub> <0.001*, p <sub>3</sub> <0.001*				

IQR: Inter quartile range

SD: Standard deviation

F: F test (ANOVA) with repeated measures, Sig. bet. periods were done using Post Hoc Test (adjusted Bonferroni)

p: p value to compare between the studied periods

p<sub>1</sub>: p value to compare between Preoperative and After 1 week

p<sub>2</sub>: p value to compare between Preoperative and After 1 month

p<sub>3</sub>: p value to compare between After 1 week and After 1 month

\*: Statistically significant at p ≤ 0.05

**Table 2:** Descriptive analysis of the studied cases based on Increase in IOP (mmHg) in each group

	Range	Mean ± SD.	Median (IQR)
Increase in IOP (mmHg)			
After 1 week – preoperative	0.0 – 2.0	0.76 ± 0.59	1.0 (0.0 – 1.0)
After 1 month – preoperative	0.0 – 3.0	1.82 ± 0.72	2.0 (1.0 – 2.0)
After 1 month – After 1 week	0.0 – 2.0	1.06 ± 0.47	1.0 (1.0 – 1.0)

IQR: Inter quartile range

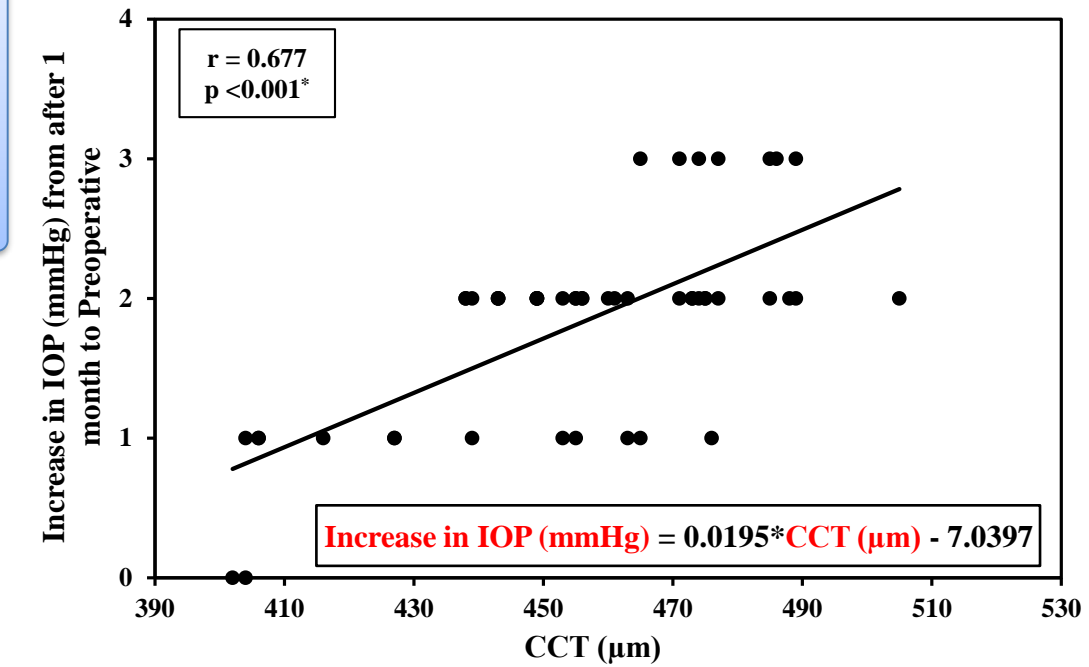
SD: Standard deviation

**Table 3:** Correlation between increase in IOP (mmHg) with thinnest corneal thickness (µm) and Km in total sample (n = 50)

Increase in IOP (mmHg) from After 1 month to Preoperative vs.	r	p
TCT (µm)	0.677	<0.001*
Km	0.018	0.903

r: Prarson coefficient

Statistically significant at p ≤ 0.05



**Figure:** Correlation between increase in IOP (mmHg) with thinnest corneal thickness (µm) and Km in total sample (n = 50)

## CONCLUSION

In conclusion, after CXL with riboflavin and UVA in eyes with keratoconus, there was a significantly increased IOP measurements on using goldmann applanation tonometry. This increase might be due to the increased rigidity of the cornea that caused by crosslinking.