Translation **Date: 26.02.2026**

Tanta University **Faculty of Medicine** **Research Ethics Committee**	**Logo of R E C** **Faculty of Medicine** **Tanta University** **Scientific Research Ethics Committee**	**Tanta University** **Faculty of Medicine** **Research Ethics Committee** **Federal Wide Assurance (FWA)** **FWA00022834** **IRB0010038**

Research Ethics Committee Review Report

Approval Code : **36264PR131099/12/25**

Name of the PI : **TAMER IBRAHIM ABDELHALIM**

Position : **Assistant Professor**

Name of the Department : **Ophthalmology**

Measuring the Changes of the Intraocular Pressure after Corneal Cross Linking using Corvis CT

Type of the Research: MS ☐ MD ☐ **Promotion Research** ☑

Project ☐

Approved ☑ Disapproved ☐ Approved after Modification ☐

Date: **04.12.2025**

Signed by:

- Chief of Ethics Committee: Prof. Dr. Magdy Eisa

Stamped by:

- The Seal and Emblem of R E C – [Research Ethics Committee] – the Faculty of Medicine – Tanta University – Scientific Research Ethics Committee

Measuring the changes of the intraocular pressure after corneal cross linking using Corvis CT

Research Project

By

Dr. Tamer Ibrahim Abd ElHalim

Principal investigator

Ass Professor of Ophthalmology, faculty of medicine,
Tanta University

Dr. Mohamed Elkadim

Lecturer of ophthalmology

Faculty of Medicine, Tanta University

Dr. Mohamed Abo Hamid

Lecturer of ophthalmology

Faculty of Medicine, Tanta University

Dr. Dina Sabry Mikheal Tadros

Ass. Professor of Ophthalmology, faculty of medicine,
Tanta University

2025

Introduction

Keratoconus (KC) is a corneal disease characterized as gradual, non-inflammatory thinning and conical protrusion of the cornea. The prevalence and incidence rates of KC have been estimated to range from 0.2 to 4790 per 100,000 people and 1.5 to 25 per 100,000 people/year, respectively, and Asians have a much higher frequency and incidence than Caucasians [1]. KC usually manifests in adolescence or early adulthood as myopia and irregular astigmatism which may significantly reduce visual quality [2] and require corneal transplantation in severe cases [3]. However, Corneal cross linking became one of the promising methods to reduce the severity of the keratoconus.

The Corvis ST device is widely used in the clinical evaluation of corneal biomechanics. It is a non-contact tonometer that uses an ultrahigh-speed Scheimpflug camera to monitor corneal behaviour during an air-puff test. This allows visualization of a large set of biomechanical deformation [4].

Machine learning techniques have repeadatly shown their usefulness in ophthalmology as an objective to diagnose certain eye conditions Glaucoma detection is one of the ocular pathologies where the most efforts regarding machine learning implementation have been made .Corneal densitometry was previously investigated as a valuable feature for detection of glaucoma suspect [5]

Aim of the study

To evaluate the changes that occur in the intraocular pressure before and after corneal cross linking using Corvis CT.

Patient and methods

Study design:

This study will be prospective study. 50 Patients who will undergo corneal cross linking from the out-patient clinic of Tanta University hospital between December 2025 and December 2026 will be included in the study .

Inclusion criteria:

Patients who will corneal cross linking for mild degree of keratoconus, age between 19 and 35 years old

Exclusion criteria:

- Corneal scarring.
- Previous corneal infections.
- Minimum corneal thickness at the thinnest location less than 400 μm.
- History of uveitis or ocular allergy.
- Pre-existing glaucoma.

Data collection will include:

Preoperative and postoperative Evaluation: Age, sex, uncorrected distance visual acuity (UDVA), corrected distance visual acuity (CDVA), manifest and cycloplegic refraction, Slit lamp biomicroscopy, fundus examination , Central corneal thickness (CCT) and average Keratometer (K)

-Intraocular pressure will be measured by using Corvis CT before cross linking and one month after cross linking

The idea of this research will be explained in detail to the participants. Their informed consent will be obtained before the commencement of the research project, and the subject will be kept fully appraised of all consequences. Every participant will have a code number. The results of this research will be used only for scientific purposes. Privacy and confidentiality of the subjects shall be maintained and without the consent of the subject, no disclosure will be made. The participant is voluntary and all subjects may discontinue participation in the research at any time without penalty or loss of benefit.

Statistical analysis

Categorical variables were analyzed using the Chi-square test or Fisher's exact test, and continuous variables were analyzed using Student's t-test, via SPSS software (version 20, IBM, Armonk, New York, USA). A P value < 0.05 will be considered statistically significant.

Results

The results obtained will be tabulated and analyzed.

REFERENCES:

1-Santodomingo-Rubido, J.; Carracedo, G.; Suzaki, A.; Villa-Collar, C.; Vincent, S.J.; Wolffsohn, J.S. Keratoconus: An updated review. Contact Lens Anterior Eye 2022, 45, 101559.

2. Krachmer, J.H.; Feder, R.S.; Belin, M.W. Keratoconus and related noninflammatory corneal thinning disorders. Surv. Ophthalmol. 1984, 28, 293–322.

3. Bahar, I.; Kaiserman, I.; Srinivasan, S.; Slomovic, A.R.; Rootman, D.S. Comparison of Three Different Techniques of Corneal Transplantation for Keratoconus. Am. J. Ophthalmol. 2008, 146, 905–912.

4- Wang LK, Tian L and Zheng YP. Determining in vivo elasticity and viscosity with dynamic Scheimpflug imaging analysis in keratoconic and healthy eyes. J Biophotonics, 2016; 9: 454–463.

5.ConsejoA,MelcerT,RozemaJJ.IntroductiontomachinelearningforophthalmologistsSemi nOphthalmol.2019;34(1):19 _41.