بسم الله الرحمن الرحيم

Ain Shams University
Information Network
جامعة عين شمس
شبكة المعلومات الجامعية
@ ASUNET

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

Correlation between Ocular Biometric Parameters and Corneal Endothelium in a Sample of Young Egyptian Adults

Thesis

Submitted for Partial Fulfillment of
MD Degree in **Ophthalmology**

By

Mohamed Nabil Hamza El Boray
M.B.B.Ch, M.Sc., Ophthalmology
Faculty of Medicine - Ain Shams University

Under Supervision of

Prof. Dr. Tamer Mohamed El Raggal, MD.
Professor of Ophthalmology
Faculty of Medicine, Ain Shams University

Prof. Dr. Maged Maher Salib Roshdy, MD.
Professor of Ophthalmology
Faculty of Medicine, Ain Shams University

Dr. Mouamen Mohamed Mostafa, MD.
Assistant Professor of Ophthalmology
Faculty of Medicine, Ain Shams University

Faculty of Medicine, Ain Shams University
2021

سورة البقرة الآية: ٣٢

Acknowledgments

First and foremost, I feel always indebted to ***Allah*** *the Most Beneficent and Merciful.*

I wish to express my deepest thanks, gratitude and appreciation to ***Prof. Dr. Tamer Mohamed El Raggal,*** *Professor of Ophthalmology, Faculty of Medicine, Ain Shams University, for his meticulous supervision, kind guidance, valuable instructions and generous help.*

Special thanks are due to ***Prof. Dr. Maged Maher Salib Roshdy,*** *Professor of Ophthalmology, Faculty of Medicine, Ain Shams University, for his sincere efforts, fruitful encouragement.*

I am deeply thankful to ***Dr. Mouamen Mohamed Mostafa,*** *Assistant Professor of Ophthalmology, Faculty of Medicine, Ain Shams University, for his great help, outstanding support, active participation and guidance.*

I would like to express my hearty thanks to all my family for their support till this work was completed.

Mohamed Nabil Hamza El Boray

List of Contents

List of Tables

Table No.	Title	Page No.

List of Figures

List of Figures cont...

List of Figures cont...

List of Figures cont...

List of Abbreviations

Abb.	Full term
ACC	Anterior corneal curvature
ACD	Anterior Chamber Depth
AL	Axial length
ANOVA	One way analysis of variance
ATPase	Adenosine-tri-phosphatase
CCT	Central corneal thickness
CV	Coefficient of variation
ECD	Endothelial cell density
IOL	Intraocular lens
IQR	Interquartile range
K	Keratometry
PACD	Primary angle-closure disease
PD	Pupil diameter
SD	Standard deviation
SM	Specular microscopy
SPSS	Statistical Package for Social Science
WTW	White to White

INTRODUCTION

Corneal endothelium is one of the five layers of the cornea and it covers its posterior surface. These metabolically active cells are responsible for regulating fluid and solute transport between the aqueous and corneal stromal compartments.[1]

For clear vision in a healthy cornea, the number of endothelial cells should be sufficient. [2] Since the corneal endothelium is incapable of mitosis, the number of cells present at birth diminishes because of several factors such as aging, trauma and surgery.[3]

The average number of endothelial cells and other parameters of endothelium in healthy subjects changes with different ethnic origins.[4] Like every tissue of the human body, the cornea undergoes age-associated changes. The cell density decreases with age. Enlargement of healthy endothelial cells and a reduction in their hexagonality occur to compensate the decrease in number.[5]

The corneal endothelium can be visualized using slit-lamp examination with high magnification and specular reflection. However, it is not possible to assess the size or number of cells with this technique. Therefore, we must rely on other diagnostic studies such as specular microscopy and confocal microscopy.[6]

In clinical practice, specular microscopy is the most accurate way to examine the corneal endothelium. It is a non-invasive photographic technique that allows visualization and qualitative and quantitative analyses of the corneal endothelium.

Instrument projects light onto the cornea and captures the image that is reflected from the optical interface between the corneal endothelium and the aqueous humor. The reflected image is analysed by the instrument and displayed as a specular photomicrograph.[7]

In addition to the endothelial cell density (ECD), other important values that reflect the health of the corneal endothelium are pleomorphism, which corresponds to the percentage of six-sided cells, and polymegathism, which characterizes cell size variability and is derived from the coefficient of variation (CV). Finally, central corneal thickness (CCT) is an indirect value of endothelial cell health because endothelial cell failure produces corneal oedema and increases CCT.[8] There are many ocular and systemic conditions that affect corneal endothelium. Long-standing anterior uveitis, diabetes mellitus, and chronic renal failure decrease ECD. Wearing contact lenses provokes pleomorphism and polymegethism of the corneal endothelium.[9-12]