

# THE PREVALENCE OF FUCHS ENDOTHELIAL CORNEAL DYSTROPHY IN ADULT PATIENTS SCHEDULED FOR CATARACT SURGERY

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## Introduction

Fuchs endothelial dystrophy (FECD) is a corneal endothelial disease characterized clinically by corneal endothelial dysfunction and guttae excrescences on the posterior corneal surface. FECD is characterized by dysfunctional corneal endothelium that deposits a posterior collagenous layer between the Descemet's membrane and the endothelial monolayer. In a healthy cornea, stromal hydration is maintained by the delicate balance between passive, inward diffusion of aqueous and active, outward transport of excess fluids by endothelium. FECD leads to impairment of the endothelial pump mechanism, resulting in corneal edema and its clinical sequelae.

Clinical manifestations of FECD may range from mild to severe. In mild FECD, patients are asymptomatic with no impairment of vision, and a diagnosis is most commonly made by incidental observations of corneal guttae during routine ophthalmologic examinations. In severe FECD, marked dysfunction of central endothelium with dense accumulations of central guttae, result in significant corneal edema, scarring and impairment of visual function.

## Aim of the Work

The aim of this study was to detect the prevalence of Fuchs endothelial corneal dystrophy in adult patients scheduled for cataract surgery in Alexandria main university hospital.

## Patients and Methods

The study was conducted on adult patients presenting with and scheduled for senile cataract surgery in the Ophthalmology department of Alexandria Main University Hospital in the period of 6 months.

Inclusion criteria were that age above 50 years, visually significant senile cataract indicated for cataract surgery and cornea with visible guttae and/or beaten bronze appearance of the endothelium. Exclusion criteria were that cataract aetiology other than senile cataract, corneal pathology except for visible guttae and ocular co-morbidity.

All subjects underwent a comprehensive ophthalmic examination. Specular microscopy was performed with a non-contact specular microscope Cellchek SL (Konan Medical Inc., USA) to analyze the corneal endothelium. IOL Master 700 (ZEISS Medical Technology-Germany) was used in measuring ocular biometric parameters before cataract surgery.

All these data were analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp). In all statistical tests, level of significance of 0.05 used, below which the results were considered to be statistically significant.

## Results

This study included 273 patients. The mean age of participants was 64 years (range, 50-85 years). By cross sectional study of this group of patients, the prevalence rate of FECD was 10 / 273 eyes "3.66 %.

We concluded that there is no statistically significant effect of age and sex on prevalence rate of FECD. Although we can detect that there is slight increase in incidence between females.

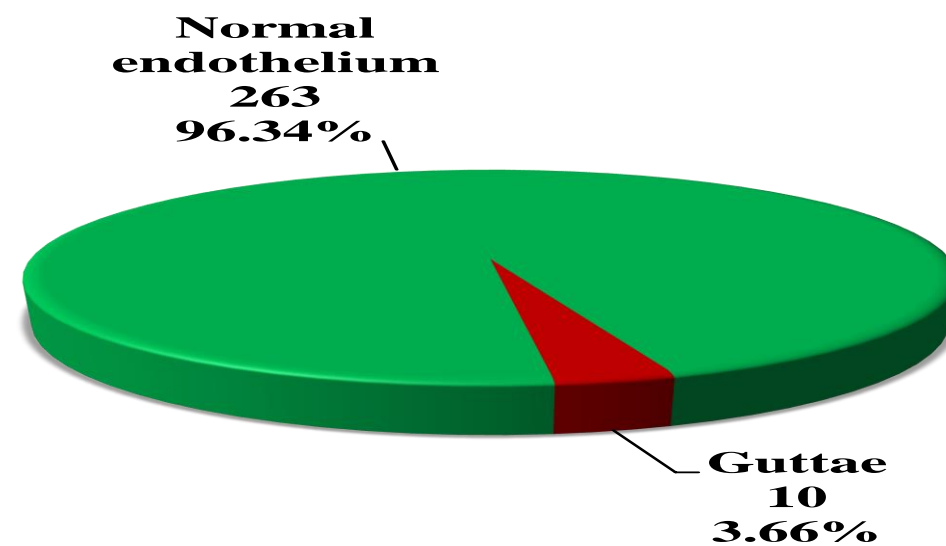


Fig (1): Percentage of FECD / number of patients

Table(1): Comparison between the two studied groups according to specular microscopy parameters

Specular Microscopy parameters	Total (n = 427)	Guttae		Test of sig.	P
		No (n = 411)	Yes (n = 16)		
<b>CD</b>					
Min. – Max.	532.0 – 3257.0	532.0 – 3257.0	1404.0 – 2841.0	U = 1662.0*	0.001*
Mean ± SD.	2632.04 ± 317.97	2648.74 ± 297.24	2203.06 ± 502.44		
Median (IQR)	2667.0 (2513 – 2817)	2674 (2528.5 – 2825)	2185 (1765 – 2695.5)		
<b>CV</b>					
Min. – Max.	24.0 – 160.0	24.0 – 63.0	28.0 – 160.0	U = 1215.50*	<0.001*
Mean ± SD.	32.93 ± 8.43	32.15 ± 4.62	53.06 ± 31.37		
Median (IQR)	32.0 (29 – 35)	32.0 (29.0 – 34.0)	46.0 (35.0 – 58.50)		
<b>HEX</b>					
Min. – Max.	26.0 – 68.0	26.0 – 68.0	33.0 – 55.0	U = 2975.50	0.528
Mean ± SD.	45.70 ± 6.86	45.68 ± 6.88	46.19 ± 6.56		
Median (IQR)	45.50 (42 – 50)	45.0 (42.0 – 50.0)	47.50 (42.50 – 50.0)		
<b>NUM</b>					
Min. – Max.	12.0 – 179.0	12.0 – 179.0	14.0 – 153.0	U = 1273.0*	<0.001*
Mean ± SD.	138.75 ± 20.74	140.36 ± 17.58	97.63 ± 43.47		
Median (IQR)	142.0 (132.0 – 150.0)	142.0 (132.0 – 150.0)	101.50 (64.0 – 137.5)		
<b>Pach</b>					
Min. – Max.	425.0 – 643.0	425.0 – 643.0	459.0 – 576.0	t=0.320	0.749
Mean ± SD.	532.23 ± 40.65	532.09 ± 40.89	535.64 ± 35.53		
Median (IQR)	534.0 (503 – 561)	532.5 (503.0 – 563.0)	549.0 (535.0 – 554.0)		

## Conclusion

FECD is the commonest type of endothelial dystrophy in individuals scheduled senile cataract operation in Alexandria Main University Hospital. The prevalence rate of FECD reaches approximately 3.66 percent that might be only determined following examination by specular microscopy.

There's a statistically significant difference between endothelial cell count in corneas suffering and not suffering FECD in each of the ECD, CV, NUM, SD, Average, Min and Max values. Yet, there's no statistically significant difference between pachymetry and hexagonality, which might be explained by that all positive cases were determined in early stages of FECD before of corneal edema development. We concluded that there is no statistically significant impact of age and gender on prevalence rate of FECD. Nevertheless, we can detect that there is slightly increased incidence between females.