

EVALUATION OF CORNEAL ENDOTHELIAL CHANGES IN PATIENTS WITH TYPE 2 DIABETES IN EGYPT

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Introduction

Worldwide, the incidence of type II diabetes mellitus is increasing, reaching epidemic proportions in developing countries. The disease entity is characterized by hyperglycemia and the development of micro- and macrovascular disorders, leading to functional and morphological disorders in several organs. Diabetes mellitus is associated also with structural changes in corneal endothelial cells and their thickness. Many clinical evidences have shown that patients with diabetes have functional abnormalities such as lower corneal sensitivity, greater baseline corneal thickness, less endothelial cell density, and increased endothelial permeability to fluorescein after intraocular surgery. Hypothetically, these phenomena could be caused by chronic metabolic changes at cellular level that primarily affect the single layer of the coherent endothelial cells. Thus, we performed our study to evaluate the differences of central corneal thickness and corneal endothelial cell morphology between diabetics and age matched healthy normal subjects.

Aim of the work

The aim of this work was to evaluate the corneal endothelial changes in patients with type 2 Diabetes mellitus.

Subjects and Methods

The study was case-control study including one hundred and four corneas, divided into two subgroups as following:

Group A: 52 eyes of 27 non-diabetic healthy persons.

Group B: 52 eyes of 27 diabetic patients (type 2), glycaemically controlled

All subjects underwent a comprehensive ophthalmic examination including:

- Full medical and ophthalmological history.
- Visual acuity testing.
- Anterior segment biomicroscopy.
- Intraocular pressure (IOP) measurement by applanation tonometry.
- Fundus examination biomicroscopy using 90° non-contact lens.

All subjects were investigated as follows to diagnose Diabetes mellitus:

- Fasting blood glucose (FBG).
- Random blood glucose (RBG).
- Glycated hemoglobin (HbA1c).

The variables that was measured in all cases include:

1. Central corneal thickness (CCT) (in μm)
2. Average size of endothelial cells (in μm^2)
3. Coefficient variation of size (CV) (polymegathism)
4. Standard deviation of size (S.D) (in μm^2)
5. Endothelial cell density (ECD) (in cells/mm²)
6. Hexagonality.(%)

Results

Table 1: Comparison between the two studied groups according to CV

CV	Group A (n = 52)	Group B (n = 52)	t	P
Min. – Max.	22.0 – 37.0	23.0 – 41.0	2.909*	0.004*
Mean $\pm$ SD.	30.35 $\pm$ 3.34	32.46 $\pm$ 4.04		
Median (IQR)	31.0 (28.0 – 33.0)	32.0 (30.0 – 34.50)		

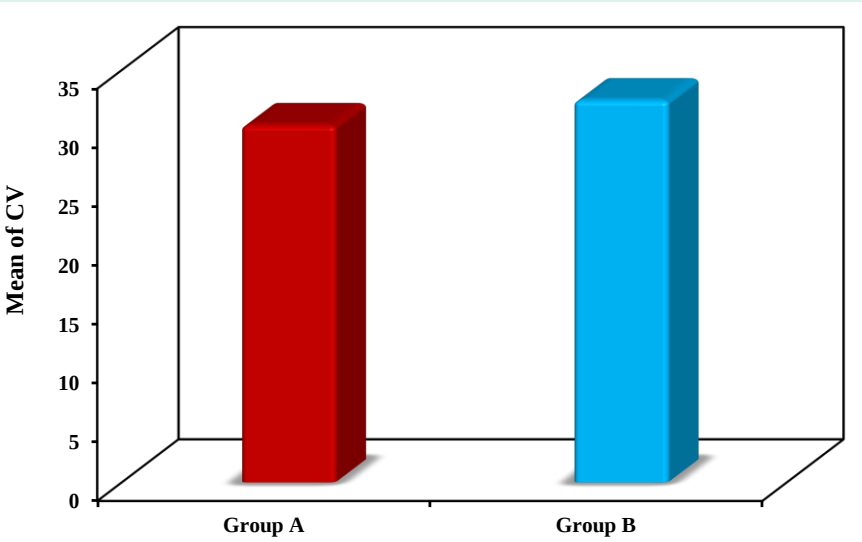


Figure 1: Comparison between the two studied groups according to CV

Table 2: Comparison between the two studied groups according to HEX %

HEX%	Group A (n = 52)	Group B (n = 52)	t	p
Min. – Max.	32.0 – 66.0	33.0 – 64.0	2.611*	0.010*
Mean $\pm$ SD.	48.67 $\pm$ 6.49	45.38 $\pm$ 6.35		
Median (IQR)	50.0 (44.0 – 53.0)	45.50 (41.0 – 48.0)		

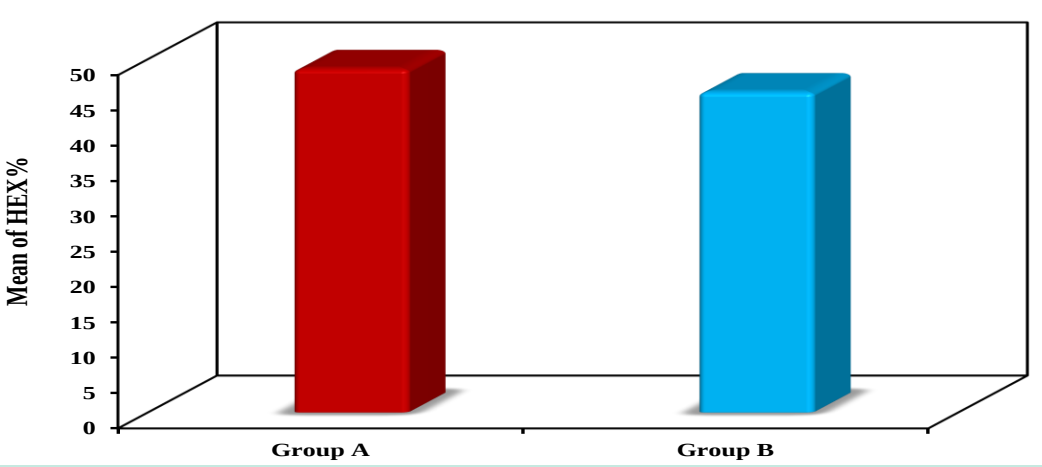


Figure 2: Comparison between the two studied groups according to HEX %.

Conclusion

- In conclusion, DM type 2 has a major influence on corneal endothelium. This influence is represented by significant decrease in endothelial cell hexagonality, while there is significant increase in coefficient of variation (CV).
- The duration of controlled DM type 2 is associated with significant increase of coefficient of variation of cell size (CV) and central corneal thickness (CCT).