



## THE ROLE OF CORNEAL ENDOTHELIAL MICROSCOPY IN THE DIAGNOSIS OF THE ANTERIOR UVEITIS OF POSTCOVID PERIOD

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### ABSTRACT

*Endothelial microscopy plays an important role in measuring the density of corneal endothelial cells for clinical diagnosis, clinical studies with pathology anterior segment postcovid period.*

**The purpose of the study:** a comparative analysis of the structure of the cornea in anterior uveitis of postcovid period.

**Material and methods of research.** We observed 11 people (22 eyes), who were divided into 2 groups. The first group consisted of 6 patients (12 eyes) with anterior uveitis of postcovid period. The second control group consisted of 5 (10 eyes) practically healthy people without any ophthalmopathy. In addition to the standard ophthalmological examination, all patients underwent endothelial microscopy of the cornea **results.** Therefore, we used endothelial microscopy examination for qualitative and quantitative determination of changes in the structure of the cornea in the early stages of anterior uveitis of postcovid period. The results of the study using endothelial microscopy differed in clinical diversity. The most pronounced changes were observed in the area of the cornea involved in the ectatic process.

**Conclusions.** In the early stages of anterior uveitis of postcovid period, as a result of degenerative changes, a decrease in the number of endothelial cells by 26.3%, a decrease in the average density of endothelial cells by 58.5% was revealed.

### INTRODUCTION

Endothelial microscopy plays an important role in measuring corneal endothelial cell density for clinical diagnosis, clinical research, and in assessing the endothelium before and after corneal surgery [1]. Endothelial microscopy is quantitative and qualitative assessment of the endothelium, the inner layer of corneal cells. Endothelial microscopy indicators help to identify pathology of cornea and plan the correct treatment for this pathology [2,5].



Uveitis is a collection of diseases characterized by inflammation within the eye, and its etiology multifactorial, including autoimmune (60.1%), systemic (30-50%), infectious (30-50%), and idiopathic (20-40%) causes [3].

Additionally, SARS-CoV-2 can induce retinal lesions or retinal vascular changes. Whether SARS-CoV-2 can cause distinct retinitis, similar to retinitis caused by herpes viruses, remains to be confirmed in larger series studies [4]

**THE OBJECTIVE OF THE RESEARCH** A comparative analysis of the structure of the cornea in anterior uveitis of postcovid period.

**SUBJECTS AND METHODS:** We observed 11 people (22 eyes), who were divided into 2 groups. The first group consisted of 6 patients (12 eyes) with anterior uveitis of postcovid period. The second control group consisted of 5 (10 eyes) practically healthy people without any ophthalmopathy. All patients underwent visometry, pneumotometry, perimetry, biomicroscopy, B-scan, and ophthalmoscopy. The study was carried out using an automated non-contact microscope TOMEY EM 400 (Japan). Advantages of study: non-contact measurement – a few seconds to examine one eye, 190 optical zoom, non-contact pachymetry, measurement of 13 zones of the cornea is available – 1 central, 6 paracentral and 6 peripheral.

**RESULTS:** Specular microscopy data showed that the CD was  $2722.56 \pm 255.31$  and  $2832.78 \pm 300/28$  in groups 1 and 2, respectively ( $p < 0.03$ ). The CV values were  $41.98 \pm 6.88$  and  $41.15 \pm 5.67$ , respectively ( $p < 0.08$ ). The hexagonality were  $45.55 \pm 75$  and  $48.12 \pm 5.87$ , respectively ( $p < 0,024$ ). Average was  $371.60 \pm 35.65$  and

$353.16 \pm 35.29$ , respectively ( $p < 0.007$ ). The CCT values were  $553.00 \pm 73.2$ , and  $526.84 \pm 33.57$ , respectively ( $p < 0.005$ ).

**Tabl.1**

Measure	Measure1 Group (n=12 eyes)	Measure 2Group (n=10 eyes)
NUM	207±9,4*	281,4±14,78
CD	2713.56±35.65*	2845,80±299,27
AVG	371.60±34.65*	353,16±35,29
SD	172,8±13,3*	126,7±7,9
CV	42,92±6,79*	40,16±5,79
MAX	1266±77,1*	819,9±48,4
MIN	91,3±6,3	95,5±3,5
6A	38,1±1,9*	49,12±6,87
CCT	553.00±12,82*	526,84±33,57

Endothelial microscopy of patients with anterior uveitis in the post-Covid period allowed us to state a decrease in the number of endothelial and hexagonal cells (polymorphism), an increase in the coefficient of change in cell area (polymegatism) and the average area of corneal cells.

Higher CCT (central corneal thickness) detected in patients with anterior uveitis in the post-Covid period is due to dysfunction of endothelial cells due to impaired immune regulation and pro-inflammatory effect in the post-Covid period.

## DISCUSSION



This study aimed to compare the effects of COVID-19 on the corneal endothelium with those in normal individuals matched in terms of age and gender using specular microscopy in the early period during recovery from the disease. The corneal specular microscopic examination showed a decrease in the number of endothelial and hexagonal cells (polymorphism) and an increase in the cell area change coefficient (polymegatism) and in the average cell area. In addition, while COVID-19 patients had a lower ECD, it was found that their endothelial parameters remained within the clinically normal range. In the early stages of anterior uveitis of postcovid period, as a result of degenerative changes, a decrease in the number of endothelial cells by 26.3%, a decrease in the average density of endothelial cells by 58.5% was revealed. This allowed us to adjust treatment tactics in accordance with the results of the study and subsequently evaluate the effectiveness of treatment using endothelial microscopy.

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