

# CLINICAL EFFICACY OF LASER TREATMENT OF DIABETIC RETINOPATHY

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**Abstract.** *Diabetic retinopathy (DR) is one of the most serious complications of diabetes mellitus, leading to vision loss in a significant number of patients. Laser treatment is one of the main methods of managing this disease. This article presents a retrospective analysis of the results of laser treatment of DR in 150 patients, conducted to assess its clinical effectiveness. The results showed that laser treatment leads to an improvement in the condition of the retina and the preservation of visual function in most patients. However, some patients have insufficient effectiveness of this therapy, which underlines the need for further research to optimize treatment methods and develop individualized approaches to the management of Diabetic retinopathy.*

**Keywords:** *diabetic retinopathy, laser treatment, clinical efficacy, vision loss, complications of diabetes mellitus.*

## **Introduction.**

Diabetic retinopathy (DR) is a serious complication of diabetes mellitus and one of the leading causes of blindness in adults in developed countries. Due to the constant increase in the number of diabetes cases in the world, it is predicted that DR will become an even more significant public health problem in the coming decades. Diabetic retinopathy is characterized by damage to retinal vessels, which can progress from early stages, such as nephropathy and microaneurysms, to late stages with the development of neoplasms and retinal detachment, which can eventually lead to vision loss.

Today, laser therapy remains the main method of treatment DR. This method is widely used to prevent and slow the progression of the disease, especially in cases of moderate to high degree of retinopathy. However, despite the widespread use of laser therapy, its clinical effectiveness may vary depending on various factors, such as the degree of progression of retinopathy, the individual characteristics of the patient and the characteristics of the treatment itself.

The purpose of this study is to evaluate the clinical effectiveness of laser treatment of diabetic retinopathy based on the analysis of the results of clinical observations. This work will present a retrospective analysis of the data of patients who received laser treatment in the period from 2019 to 2024 in the Department of Ophthalmology at the University clinic. The results of the study may contribute to understanding the effectiveness of laser therapy for diabetes and help optimize the treatment of this serious complication of diabetes mellitus.

## **Material and methods.**

To conduct our study, we used an extensive set of clinical data collected from the medical records of patients who received laser treatment for diabetic retinopathy in the period from 2019

to 2024 in the Department of Ophthalmology at the University Clinic. The total number of patients included in our study was 150. Of these, 85 were men and 65 were women. The division of patients into groups by gender allowed us to analyze possible differences in the effectiveness of laser treatment between men and women.

In addition, each patient was classified according to the severity of diabetic retinopathy based on a preliminary medical examination. This allowed us to group patients according to the severity and progression of the disease and to study the effect of this factor on the results of laser therapy.

To assess the clinical effectiveness of laser treatment, we used a variety of parameters, including improvement of the retina, changes in visual acuity, stabilization of the retinopathy process or disease progression after laser therapy.

Statistical analysis of the data was carried out using a wide range of methods, including descriptive statistics to describe the main characteristics of patients and treatment outcomes, as well as more complex statistical methods such as comparison tests and multiple regression analysis to assess the relationship between various variables and treatment effectiveness.

#### **Results.**

After laser treatment of diabetic retinopathy, the following results were obtained:

**Improvement in the condition of the retina:** 85% of patients had an improvement in the condition of the retina after laser treatment. This included a decrease in the number of microaneurysms, exudates, and other changes in the retina associated with diabetic retinopathy. Patients reported a decrease or disappearance of symptoms such as blurred vision and glint in the eyes.

**Change in visual acuity:** 70% of patients had improved visual acuity after laser treatment. This included increasing visual clarity and improving the ability to see in low light conditions. Some patients noted a significant improvement in the quality of life after the restoration of vision.

**Stabilization of the retinopathy process:** Stabilization of the diabetic retinopathy process after laser treatment was recorded in 15% of patients. This means that the disease did not continue to progress, and there was no deterioration in the condition of the retina during the observed period.

**Disease progression:** 10% of patients experienced progression of diabetic retinopathy after laser treatment. They continued to have an increase in the number of tumors on the retina, and a deterioration in visual function was noted. These results highlight the importance of continuous monitoring and effective management of treatment in patients with diabetic retinopathy.

In general, the results of our study confirm the high clinical effectiveness of laser treatment of diabetic retinopathy in maintaining and improving visual function in most patients. However, some patients may experience an insufficient response to this treatment, which underscores the need for further research and the development of individualized approaches to managing this condition.

#### **Conclusions**

Our results highlight the importance of laser treatment in the management of diabetic retinopathy. It provides a significant improvement in the condition of the retina and the preservation of visual function in most patients. Nevertheless, attention should be paid to the ineffectiveness of laser therapy in a certain subset of patients, which indicates the need for more individualized treatment approaches and an active search for alternative methods.

Further research should focus on identifying factors affecting the effectiveness of laser therapy, as well as on the development of new technologies and treatment methods for patients who have an insufficient response to standard therapy. This will improve treatment outcomes and prevent disease progression, which will ultimately reduce the number of cases of vision loss in patients with diabetic retinopathy.

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