Abstract:

Micropulse laser therapy of cystoid macular edema

Introduction: Diabetic retinopathy (DR) is a typical microvascular complication of diabetes mellitus (DM). The most common manifestation of DR that reduces vision is diabetic macular edema (DME). The objective of this study was to evaluate the efficacy of DME therapy using subthreshold micropulse laser (SMPL) with a wavelength of 577 nm.

Cohort and methods: The cohort with a monitoring period of 1 year included the total number of 167 eyes of 111 patients with DME. The cohort with a monitoring period of 3 years included the total number of 70 eyes of 47 patients. The cohort with a monitoring period of 5 years included the total number of 52 eyes of 34 patients. None of the patients met the reimbursement criteria for DME treatment with intravitreal administration of anti-VEGF or did not wish to undergo that treatment. All the eyes underwent treatment of the retina outside the macula with a standard laser pulse therapy. The treatment depended on the type of DR. On the day of being included in the study, DME therapy using SMPL. Subsequent check-ups were followed every 3 months in the first year of the treatment, and every 4 to 6 months in the following years. The laser treatment of the retina was repeated during the check-ups as needed. The treatment was combined neither with focal macular laser nor with anti-VEGF therapy.

Results: At the beginning of the monitoring period, the mean central retinal thickness (CRT) was 378.8 µm, standard deviation (SD) 133.0 µm in the cohort with a monitoring period of 1 year. One year later, the mean CRT was 333.9 µm, SD 126.8 µm, mean CRT changed by - 45.0 µm SD 143.3 µm. At the beginning of the monitoring, total macular volume (TMV) was 9.834 mm³, SD 1.630 mm³. One year later, the mean TMV was 9.522 mm³, SD 1.473 mm³, mean TMV changed – 0.312 mm³, SD 0.912 mm³. At the beginning of the monitoring, the best corrected visual acuity (BCVA) was 67.0, SD 12.0 ETDRS letters. One year after therapy, BCVA was 67.3, SD 12.9 letters, the mean BCVA increased by 0.3, SD 8.1 letters.

At the beginning of the monitoring period, the mean CRT was 373.6 µm, SD 131.0 µm in the cohort with a monitoring period of 3 years. 3 years later, the mean CRT was 311.6 µm, SD 136.4 µm, mean CRT changed by - 61.6 µm SD 188.8 µm. At the beginning of the monitoring, TMV was 9.826 mm³, SD 1.436 mm³. 3 years later, the mean TMV was 9.303 mm³, SD 1.279 mm³, mean TMV changed – 0.522 mm³, SD 1.518 mm³. At the beginning of the monitoring, the BCVA was 67.9, SD 11.7 ETDRS letters. 3 years later, BCVA was 66.3, SD 13.1 letters, the mean BCVA decreased by 1.6, SD 10.1 letters.

At the beginning of the monitoring period, the mean CRT was 345.9 µm, SD 122.6 µm in the cohort with a monitoring period of 5 years. 5 years later, the mean CRT was 256.4 µm, SD 98.4 µm, mean CRT changed by – 89.5 µm SD 153.6 µm. At the beginning of the monitoring, TMV was 9.867 mm³, SD 1.434 mm³. 5 years later, the mean TMV was 8.631 mm³, SD 0.721 mm³, mean TMV changed – 1.055 mm³, SD 1.294 mm³. At the beginning of the monitoring, the BCVA was 70.0, SD 10.1 ETDRS letters. 5 years later, BCVA was 66.9, SD 12.1 letters, the mean BCVA decreased by 3.1, SD 10.9 letters.

Conclusions: Based on our long-term monitoring, the DME treatment with SMPL appears to be an effective method. Its main advantage is that no scarring occurs on the retina, and therefore it can be repeated as needed or it can be combined with other kinds of treatment.