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Subthreshold micropulse laser treatment in patients with chronic central serous chorioretinopathy under prolonged stress

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Research Article

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Abstract

Introduction

This study purpose to evaluate the results of 577-nm subthreshold micropulse laser treatment in patients with chronic central serous chorioretinopathy under prolonged stress.

Methods

This study was a prospective, comparative, interventional, single-centre observation of 65 patients (65 eyes) with chronic central serous chorioretinopathy (CSC). All patients were divided into a civilian group (36 patients) and a military group (29 patients). All patients underwent subthreshold micropulse laser treatment (SMLT) using a laser with a wavelength of 577 nm. The main endpoint was best-corrected visual acuity (BCVA) at Months 12.

Results

Baseline mean BCVA in patients with chronic CSC was 0.66 (0.22). At Months 12, mean decimal BCVA statistically significantly increased to 0.74 (0.25) (p = 0.000). In military group, mean decimal BCVA increased statistically significantly from 0.65 (0.26) to 0.73 (0.25) (p = 0.01) at Month 12, and in civilian group – from 0.66 (0.18) to 0.77 (0.25) (p = 0.000). At the final visit, no significant difference was observed between mean decimal BCVA values in the two groups (p = 0.4). At Month 12, in overall cohort, complete resorption of subretinal fluid (SRF) was noted in 60% of cases (39 patients). In military group, complete resorption of SRF was observed in 52% of patients (15 patients) and in civilian group — 67% (24 patients). No statistically significant difference between the groups in the frequency of complete resorption of SRF was found (p = 0.2). In overall cohort, mean of laser sessions of was 1.7 (0.7) during all observation period. In military group, mean number of SMLT sessions was 1.9 (0.9) and in the civilian group — 1.4 (0.6). The difference between the groups in the number of laser sessions performed was statistically significant (p = 0.01).

Conclusions

SMLT is an effective and safe method for treating patients with chronic CSC under prolonged stress.

Introduction

Chronic central serous chorioretinopathy (CSC) is a macular disorder characterised by serous retinal detachment, damage to the retinal pigment epithelium, reduced visual acuity and a significant deterioration in quality of life.[1,2] The prolonged course of the disease leads to irreversible functional and structural changes in the retina, necessitating an individualised approach to treatment selection.[3]

Among the key risk factors for the development of CSC, psychological and emotional stress plays a particularly significant role, as it is directly correlated with elevated blood cortisol levels.[4] Prolonged

exposure to elevated levels of exogenous and endogenous glucocorticoids plays an important role in the pathogenesis of CSC.[5]

The full-scale war in Ukraine has created unique clinical conditions characterized by the prolonged and intense impact of stressors on both military personnel and the civilian population. In wartime conditions, the role of stressors increases significantly, particularly among military personnel who experience prolonged psycho-emotional strain caused by participation in combat operations, a constant threat to life, significant physical exertion and disruption to sleep patterns.[6,7] Among the civilian population, war triggers other, but no less significant, stressors – the loss of loved ones, forced displacement, the breakdown of social ties, and chronic anxiety.[8,9] The impact of war-related stress on the clinical course and treatment outcomes of CSC remains poorly understood.

Photodynamic therapy (PDT) with verteporfin is one of the most effective treatments for chronic CSC, enabling an improvement in visual acuity and anatomical outcomes in the majority of patients.[10] However, since 2021, there has been a prolonged global shortage of verteporfin, which significantly limits the availability of PDT for patients with chronic CSC. The shortage of the drug leads a risk that patients with chronic CSC may not receive treatment, which could lead to irreversible loss of visual acuity.[11] In such cases, subthreshold micropulse laser treatment (SMLT) is considered an alternative that has demonstrated efficacy in reducing subretinal fluid (SRF) and improving visual function with a minimal risk of complications.[12,13,14] At the same time, the efficacy of SMLT in patients under chronic stress, particularly in wartime conditions, remains insufficiently studied.

Therefore, investigating the efficacy of SMLT in patients with chronic CSC exposed to prolonged war-related stress is clinically relevant, as preservation of visual function may contribute to maintaining patients' quality of life and functional capacity. Thus, the purpose of this study was to evaluate the results of 577-nm SLMT in patients with chronic CSC under conditions of prolonged stress.

Methods

This prospective, comparative, interventional, single-centre study of patients with chronic CSC was conducted at the State Institution "The Filatov Institute of Eye Diseases and Tissue Therapy of National Academy of Medical Sciences of Ukraine" from June 2024 to March 2026. The study was approved by the local ethics committee (protocol No. 4) and conducted in accordance with the principles of the Declaration of Helsinki. Prior to the start of treatment, written informed consent to participate in the study was obtained from all patients. The trial was performed as a part of the research studies of the State Institution "The Filatov Institute of Eye Diseases and Tissue Therapy of National Academy of Medical Sciences of Ukraine" (state registration number: 0125U002070).

Inclusion criteria: patients aged ≥ 18 years with active chronic CSC, defined as serous retinal detachment on optical coherence tomography (OCT) of the retina in combination with focal or diffuse areas of leakage on fluorescein angiography (FA).

Exclusion criteria: previous laser treatment for CSC, glaucoma or suspected glaucoma, intraocular or periocular inflammation, other macular diseases that may affect visual acuity (e.g., age-related macular degeneration, retinal vascular occlusion, diabetic retinopathy, epiretinal membrane, any hereditary retinal disease). Exclusion criteria not related to the eyes were: use of systemic corticosteroids, uncontrolled hypertension, pregnancy, and inability to obtain the patient's informed consent.

All patients were stratified according to the nature of their stress load into two groups: military personnel (active-duty service combat members) who had been exposed to prolonged combat stress, and civilian patients who had been under the influence of chronic psycho-emotional stress associated with military events. For a qualitative assessment of stress factors, the following factors were taken into account: sleep disturbances, prolonged psycho-emotional strain, participation in combat operations (for military personnel), forced displacement, loss of home or loved ones, as well as changes in social and living conditions. Clinical and demographic data were collected using a structured baseline interview. Given the specific conditions of wartime, these factors were considered as markers of chronic stress, which potentially influences the course of the disease, the frequency of relapses, and the response to treatment. All participants received detailed information regarding the disease, the proposed study and treatment. Following consent, patients underwent a baseline examination, which included: best-corrected visual acuity (BCVA), intraocular pressure (IOP) measurement, biomicroscopy, wide-pupil fundus examination, OCT and OCT angiography (SOCT Copernicus OPTOPOL Technology S.A., Zawiercie, Poland) and FA (TRC 50 – EX; Topcon, Tokyo, Japan).

All patients with chronic CSC underwent subthreshold micropulse laser coagulation using a 577 nm wavelength laser (Supra, Quantel Medical, Cedex, France). An Ocular Mainster (Standard) Focal/Grid contact lens (laser spot magnification × 1.05; Ocular Instruments, Bellevue, Washington, USA) was used for the procedure. All patients received laser treatment with the following parameters: spot size 100 μm, exposure time 0.2 s, and duty cycle 9%. Individual power settings for each patient were titrated on normal retina in the area of the vascular arcades in micro-pulse mode. Power titration was performed by gradually increasing the power until a barely visible coagulate appeared, after which the power was reduced by 50%.[15,16]

Prior to inclusion in the study, all patients with chronic CSC underwent: BCVA testing, IOP measurement, OCT, fundus photography, FA and OCT angiography. Subsequent monitoring was carried out monthly for 12 months. Intraocular pressure measurement, dilated fundus examination and OCT were repeated at each subsequent visit. OCT angiography, FA and fundus photography were performed during the first and final visits. OCT angiography and FA were also performed in cases of increasing serous neuroepithelial detachment as shown by OCT and/or reduced BCVA. Micropulse laser treatment was repeated in cases of increased subretinal fluid (SRF), recurrence of chronic CSC, or the appearance of new leakage points on FA.

The primary outcome measure was BCVA at Month 12. Secondary outcomes: central retinal thickness (CRT), maximum height of SRF, height of pigment epithelium detachment (PED), subfoveal choroidal

thickness (SFCT), SRF resorption, number of laser coagulation sessions performed, and safety at the 12-month follow-up.

In the present study, CRT, maximum height of SRF, height PED and SFCT were measured manually using the ‘Calipers’ program during OCT at each visit.

Statistical analysis was performed using TIBCO® Statistica 14.0.1 (TIBCO Software Inc., Palo Alto, CA, USA) for Windows. In this study, continuous data are presented as mean and standard deviation (M ± SD); categorical data are presented as percentages and frequencies, % (n). Clinical characteristics were compared during the observation period using paired t-tests. To compare clinical characteristics between the two groups, t-tests and Fisher’s exact test were used. In all statistical analyses, the significance level was set at $p < 0.05$.

Results

The study included 74 patients (74 eyes) with chronic CSC. All patients were divided into two groups: military group comprising 34 patients (34 eyes) and civilian group — 40 patients (40 eyes).

A total of 65 patients (65 eyes) completed the 12-month follow-up period. In military group, 29 out of 34 patients completed the study; five patients dropped out of the follow-up between the 1st and 6th months. In civilian group, 36 out of 40 patients completed the all follow-up period; two patients withdrew at the 3rd month, one at the 6th month and one at the 9th month of follow-up. None of the patient withdrawals were related to the treatment administered. The main clinical and structural parameters of the patients are presented in Table 1.

Table 1
Baseline demographic, visual and structural characteristics of patients with chronic CSC

Variable	Total n = 65	Military group n = 29	Civilian group n = 36	*p*
Age, years (SD)	44 (6)	42 (7)	45 (5)	0.1
Sex, male, n (%)	55 (85)	28 (96)	27 (75)	0.02
Mean decimal BCVA (SD)	0.66 (0.22)	0.65 (0.26)	0.66 (0.18)	0.9
Detachment of RPE, n (%)	25 (38)	14 (48)	11 (31)	0.2
Mean CRT (SD), μm	319 (132)	327 (137)	311 (130)	0.7
Mean maximum height of SRF (SD), μm	215 (160)	222 (156)	208 (167)	0.8
Mean SFCT (SD), μm	503 (101)	525 (100)	480 (99)	0.07

p values represent significance of comparison between military group and civilian group

CSC central serous chorioretinopathy, *BCVA* best corrected visual acuity, *RPE* retinal pigment epithelium, *CRT* central retinal thickness; *SRF* subretinal fluid; *SFCT* subfoveal choroidal thickness, SD standard deviation.

Table 1

Before treatment, there were no statistically significant differences between military and civilian patients in age, BCVA, the number of cases of PED, CRT, maximum height of SRF, and SFCT. At the same time, there were statistically significantly more male patients in military group compared with civilian group ($p = 0.02$).

Visual acuity

Baseline mean decimal BCVA in overall cohort of patients with chronic CSC was 0.66 (0.22). At Month 12, mean decimal BCVA increased statistically significantly to 0.74 (0.25) ($p = 0.000$). A statistically significant increase in mean decimal BCVA was observed during of all follow-up period ($p < 0.05$) (Fig. 1).

Figure 1

In military group, mean decimal BCVA increased statistically significantly from 0.65 (0.26) to 0.73 (0.25) ($p = 0.01$) at Month 12, and in civilian group – from 0.66 (0.18) to 0.77 (0.25) ($p = 0.000$). At the final visit, no significant difference was observed between mean decimal BCVA values in the two groups ($p = 0.4$). Throughout the entire observation period, a statistically significant improvement in mean decimal BCVA was noted in both groups ($p < 0.05$).

Central retinal thickness.

In overall cohort of patients, a statistically significant reduction in mean CRT was recorded throughout the observation period, from 319 (132) μm at baseline to 218 (72) μm at Month12 ($p < 0.001$) (Fig. 2). In the group of military group, mean CRT was 327 (137) μm before treatment, and in the civilian group, it was 311 (130) μm. At Month 12, a statistically significant reduction in mean CRT was observed to 220 (79) μm in military group ($p = 0.000$) and to 215 (64) μm in civilian group ($p = 0.000$). At the final visit, no statistically significant difference was found between the CRT values in the two groups ($p = 0.9$). Throughout the entire observation period, a significant reduction in CRT was observed in both groups compared with baseline levels ($p < 0.05$).

Figure 2

Maximum height of subretinal fluid

In overall patient cohort, the baseline mean maximum height of SRF decreased statistically significantly from 215 (160) μm to 48 (101) μm at Month 12 ($p = 0.000$). In military group, baseline mean maximum height of SRF was 222 (156) μm, and in civilian group – 208 (167) μm. At the final visit, a statistically significant reduction in mean maximum height of SRF was noted in both groups: to 44 (79) μm in military group ($p = 0.000$) and to 52 (121) μm in civilian group ($p = 0.000$). No statistically significant difference between the groups was found at Month 12 ($p = 0.8$). Throughout the entire treatment period, a significant reduction in the maximum height of SRF was observed in both groups ($p < 0.05$).

Height of pigment epithelium detachment

In overall patient cohort, PED was detected in 25 of 65 patients with chronic CSC. Baseline mean height of PED was 120 (94) μm. At Month 12, a statistically significant decrease in mean height of PED to 32 (44) μm was noted ($p = 0.000$). The initial mean height of PED in military group ($n = 14$) was 127 (86) μm, and in the civilian group ($n = 11$) — 111 (107) μm. At the final visit, a statistically significant decrease in mean height of PED was recorded in both groups: to 34 (46) μm in military group ($p = 0.001$) and to 30 (42) μm in civilian group ($p = 0.000$). No statistically significant difference between the groups was found at Month 12 ($p = 0.9$). Throughout the entire observation period, a statistically significant reduction in mean height of PED was noted in both groups ($p < 0.05$).

Resorption of subretinal fluid.

At the 12-month follow-up, complete resorption of SRF was observed in 60% of cases (39 patients) in the overall patient cohort. In military group, complete resorption of SRF was observed in 52% (15 patients), and in civilian group — 67% (24 patients). No statistically significant difference between the groups was found in the frequency of complete SRF resorption ($p = 0.2$).

During all observation period, recurrence of SRF was recorded in 21% (14 patients): 28% (8 patients) in military group and 17% (6 patients) in civilian group. No statistically significant difference in the recurrence rate was found between both groups (p = 0.3).

Subfoveal choroidal thickness.

Baseline mean SFCT in the overall group was 503 (101) µm. At Month 12, mean SFCT was significant decrease to 478 (90) µm (p = 0.01) (Fig. 3).

Figure 3

In military group, mean SFCT decreased significantly from 525 (100) µm at baseline to 492 (82) µm at Month 12 (p = 0.001). In civilian group, mean SFCT decreased from 480 (99) µm to 463 (96) µm (p = 0.02). At the final visit, no statistically significant difference was found between two groups (p = 0.6). During all observation period, a statistically significant reduction in mean SFCT was noted in both groups (p < 0.05).

Table 2 shows changes in visual and anatomical characteristics in military and civil patients with chronic CSC after SMLT during 12 months of follow-up.

Table 2
Change visual and anatomical characteristics in military and civil patients with chronic CSC after SMLT during 12 months of follow-up (1 month, 3 months, 6 months and 12 months)

Variable	Baseline	1 month	3 months	6 months	12 months	*p***
Decimal Military, n = 29	0.65 (0.26)	0.69 (0.27)	0.73 (0.26)	0.74 (0.25)	0.73 (0.25)	0.4
BCVA (SD) *p**		0.01	0.000	0.001	0.01	
Civil, n = 36	0.66 (0.18)	0.72 (0.21)	0.76 (0.21)	0.76 (0.23)	0.77 (0.25)	
*p**		0.01	0.000	0.001	0.000	
CRT Military, n = 29	327 (137)	261 (91)	238 (90)	235 (75)	220 (79)	0.9
(SD), μm *p**		0.002	0.001	0.001	0.000	
Civil, n = 36	311 (130)	266 (99)	252 (100)	234 (92)	215 (64)	
*p**		0.02	0.004	0.001	0.000	
Maximum Military, n = 29 of height SRF *p** (SD), μm Civil, n = 36 *p** *p**	222 (156)	151 (136)	74 (99)	84 (159)	44 (79)	0.8
		0.02	0.000	0.000	0.000	
	208 (167)	139 (150)	83 (91)	68 (109)	52 (121)	
		0.01	0.000	0.000	0.000	
Height of Military, n = 14	127 (86)	77 (73)	60 (53)	58 (47)	34 (46)	0.9
PED (SD), μm *p**	111 (107)	0.001	0.000	0.000	0.000	
Civil, n = 11		57 (68)	54 (60)	40 (39)	30 (42)	
*p**		0.01	0.01	0.002	0.001	
SFCT Military, n = 29	525 (100)	504 (100)	499 (92)	498 (91)	492 (82)	0.6
(SD), μm *p**		0.03	0.01	0.01	0.001	
Civil, n = 36	480 (99)	464 (106)	458 (99)	465 (95)	463 (96)	

*p** values represent significance of comparison to baseline data at each time point within the group

*p*** values represent significance of comparison between military group and civilian group in the final visit

CSC central serous chorioretinopathy, *SMLT* subthreshold micropulse laser treatment, *BCVA* best corrected visual acuity, *CRT* central retinal thickness, *SRF* subretinal fluid, *PED* pigment epithelium detachment, *SFCT* subfoveal choroidal thickness, *SD* standard deviation.

Variable	Baseline	1 month	3 months	6 months	12 months	*p***
*p**		0.02	0.01	0.02	0.02	
Complete Military, n = 29		2 (7)	10 (34)	11 (38)	15 (52)	0.2
resolution		7 (19)	12 (33)	17 (47)	24 (67)	
of SRF, n (%) Civil, n = 36						
*p** values represent significance of comparison to baseline data at each time point within the group						
*p*** values represent significance of comparison between military group and civilian group in the final visit						
CSC central serous chorioretinopathy, *SMLT* subthreshold micropulse laser treatment, *BCVA* best corrected visual acuity, *CRT* central retinal thickness, *SRF* subretinal fluid, *PED* pigment epithelium detachment, *SFCT* subfoveal choroidal thickness, *SD* standard deviation.						

Table 2

Number of subthreshold micropulse laser treatment sessions.

During 12-month follow-up period, in overall group, mean SMLC sessions were 1.7 (0.7). Specifically, 32 patients underwent one session of SMLC, 25 patients had two sessions, 7 patients received three sessions, and 1 patient – four sessions. In military group, mean number of SMLC sessions was 1.9 (0.9) (from 1 to 4 sessions) and in civilian group – 1.4 (0.6) (from 1 to 3 sessions). The difference between both groups in the number of SMLC sessions was statistically significant (p = 0.01).

Safety

No treatment-related ocular or systemic adverse events were observed throughout the study period. No vision-threatening complications occurred. According to ophthalmoscopy, OCT and FA, no evidence of retinal or macular damage was detected after SMLT.

Discussion

This prospective study evaluated the efficacy and safety of SMLT in patients with chronic CSC during the ongoing war in Ukraine, with a separate analysis of the results in military and civilian patients. The results demonstrate that SMLT provides significant functional and anatomical improvement in patients with chronic CSC, even under conditions of prolonged wartime stress. Importantly, treatment was not associated with any vision-threatening ocular or systemic adverse events, confirming the favorable safety profile of this modality.

A distinctive feature of the present study is the analysis of treatment outcomes between two populations exposed to different patterns of chronic stress: military personnel directly involved in military service and

civilians living under wartime conditions. Although visual and anatomical outcomes at 12 months were comparable between groups, military patients required significantly more SMLT sessions during follow-up.

The results obtained may be interpreted in the context of CSC pathophysiology. High stress levels sleep disturbances and elevated cortisol levels, which in turn contribute to increased vascular endothelial permeability and dysfunction of the retinal pigment epithelium, are risk factors for CSC.[5,17,18] Military personnel are frequently exposed to psycho-emotional stress caused by participation in combat operations, significant physical exertion and disrupted sleep patterns,[7,8] these factors may contribute to frequent recurrence of CSC and necessitate repeat treatment. Although stress levels were not directly quantified in the present study, the higher treatment burden observed among military patients is consistent with this hypothesis. Similar observations were reported by Nenciu et al., who identified an association between Type A personality traits and CSC among military personnel and reported a higher frequency of disease recurrence requiring repeated laser treatment in this population.[19]

In the present study, there was a statistically significant improvement in BCVA at the 12-month follow-up, in the overall cohort and separately among military and civilian patients with chronic CSC. This is consistent with previously published data demonstrating functional improvement after SMLT in chronic CSC.[20,21,22] Furthermore, our study demonstrated the absence of a statistically significant difference between BCVA in civilian and military patients at Month 12. These findings indicate a positive effect of SMLT on BCVA under conditions of heightened psychological and emotional stress.

The improvement in anatomical results on OCT confirms the efficacy of SMLC in patients with chronic CSC. The biological effects of micropulse laser treatment are believed to result from selective stimulation of the retinal pigment epithelium without causing detectable retinal damage, leading to restoration of retinal pigment epithelium pump function and improved fluid homeostasis.[16,23] In the present study, significant decrease in CRT, maximum height of SRF and height of PED were observed across the entire cohort, as well as within civilian and military patients. Complete resorption of SRF in the overall patient cohort was observed in 60% of cases (52% in the military group and 67% in the civilian group), which is consistent with the results of previous studies. Thus, in a prospective study, Schworm and colleagues demonstrated that at 12 months of follow-up, SRF resorption following subthreshold laser (577 nm) therapy was observed in 53.8% (21 eyes).[22] Gao et al., demonstrated that complete resorption of SRF was recorded in 59.5% (22 eyes) following subthreshold laser treatment.[24] Gawęcki et al., reported achieving complete resorption of SRF in 70.6% (36 cases), with only 13.9% of patients requiring a second treatment session.[25] Another study found that at least two sessions of SMLT were performed in 18.84% of patients with chronic CSC, highlighting the need for repeat interventions in some patients.[26] Işık and colleagues demonstrated complete resorption of SRF in 67.2% of patients, with a recurrence rate of 10.3% and a maximum of two treatment sessions.[27]

In the current study, SRF recurrence occurred in 21% of patients (8 cases in the military group and 6 in the civilian group) during the 12-month follow-up period, and the mean number of SMLT sessions was 1.7 (0.7). Notably, military personnel required significantly more treatment sessions than civilians (1.9 (0.9) vs. 1.4 (0.6), respectively). These results may indicate a more recurrent or resistant course of chronic CSC in military personnel, which is potentially associated with constant psycho-emotional stress, sleep disturbances and the influence of stress factors, and requires a greater number of treatment sessions to achieve an anatomical outcome. However, despite this, the final functional and anatomical treatment outcomes in both groups were comparable, confirming the efficacy and safety of SMLT. These results may reflect a more recurrent disease course in military patients with chronic CSC requires a greater number of treatment sessions to achieve an anatomical outcome.

The present study has several limitations. First, it was conducted at a single center and included a relatively small number of participants. Second, no direct comparison was performed with other established treatment modalities, particularly photodynamic therapy. Third, psychological stress and sleep quality were not assessed using validated instruments. Future multicenter studies incorporating objective psychological assessments and comparisons with alternative treatment strategies are warranted.

Despite these limitations, this study provides novel evidence regarding the use of SMLT in chronic CSC under prolonged stress. From a clinical perspective, the findings suggest that patients under prolonged stress, particularly military personnel, may benefit from closer follow-up and may require more frequent retreatment to achieve anatomical improvement. Nevertheless, the comparable final visual outcome observed in military and civilian groups supports the role of SMLT as a first-line treatment option for chronic CSC, especially in settings where access to alternative therapies may be limited.

Conclusion

SMLT is an effective and safe method for treating patients with chronic CSC under prolonged stress. Military patients may require more intensive treatment; however, the final functional and anatomical outcomes remain comparable to those in the civilian population. Further research should focus on quantifying stress factors, identifying predictors of treatment response and assessing long-term outcomes in patients with chronic CSC who are under prolonged stress.

Declarations

Ethical Approval and Consent to participate

The study adhered to the principles of the Declaration of Helsinki and was approved by the Ethics Committee of the State Institution «The Filatov Institute of Eye Diseases and Tissue Therapy of the National Academy of Medical Sciences of Ukraine» (protocol No. 4) in 2024.

Consent for publication

Not applicable.

Consent to participate

Written informed consent to participate in the study was obtained from all individual participants included in the study.

Conflict of Interest

Andrii Korol is a consultant and speaker for Novartis, Thea, Bayer and Roche. The authors have no potential conflicts of interest.

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Author Contribution

The authors confirm their contribution to the paper as follows: Conception and design of the study: Andrii Korol, Natalya Pasyechnikova, Taras Kustryn; Data collection: Taras Kustryn, Illia Nasinnyk, Valeriia Shcherbakova; Analysis and interpretation of results: Taras Kustryn, Oleg Zadorozhnyy, Andrii Korol; Drafting the manuscript: Taras Kustryn, Oleg Zadorozhnyy, Valeriia Shcherbakova. All authors reviewed the results and approved the final version of the manuscript.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Figures

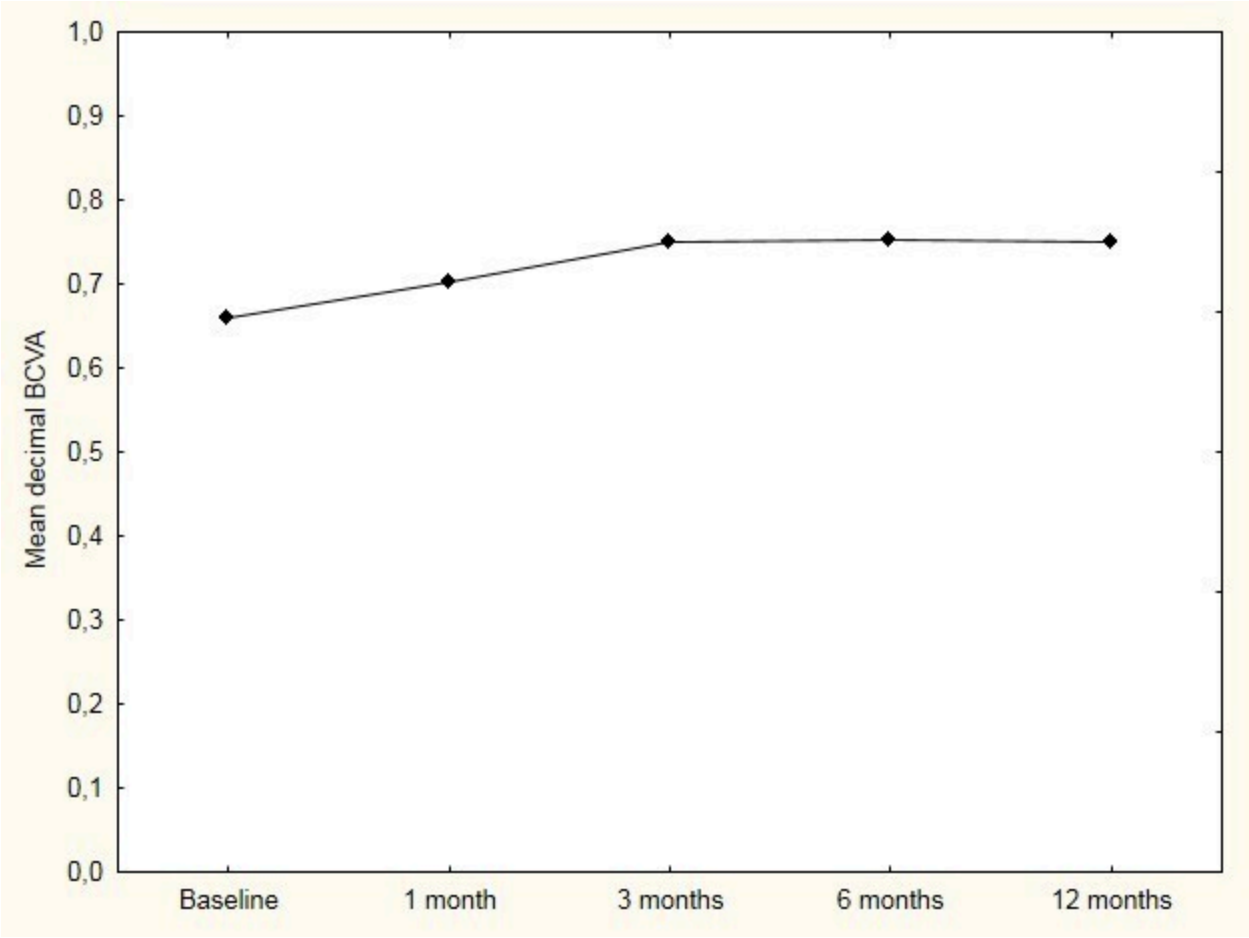


Figure 1

Change in mean decimal best corrected visual acuity (BCVA) in overall cohort of patients with chronic central serous chorioretinopathy (CSC) during 12 months of follow-up.

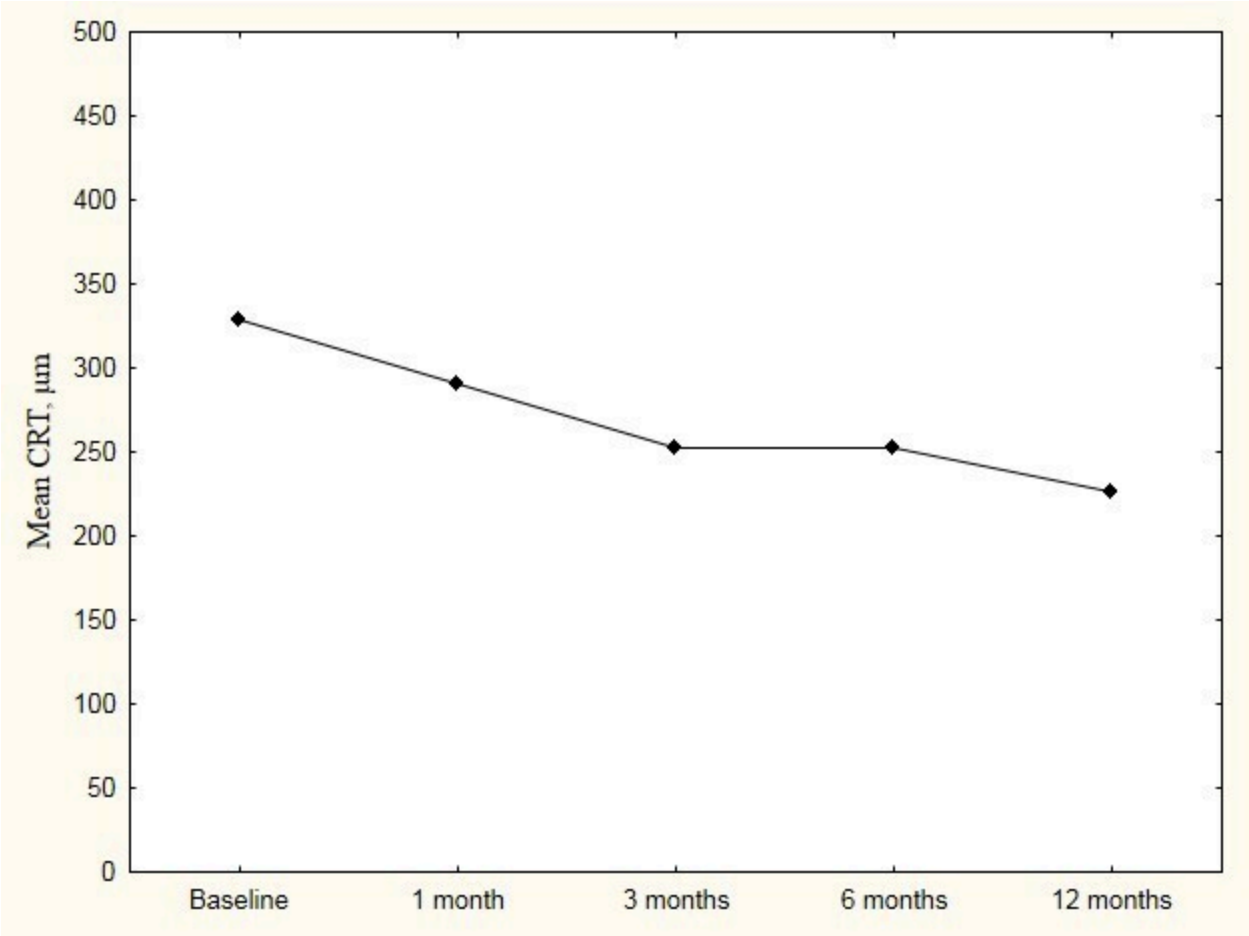


Figure 2

Change in mean central retinal thickness (CRT) in overall cohort of patients with chronic central serous chorioretinopathy (CSC) during 12 months of follow-up.

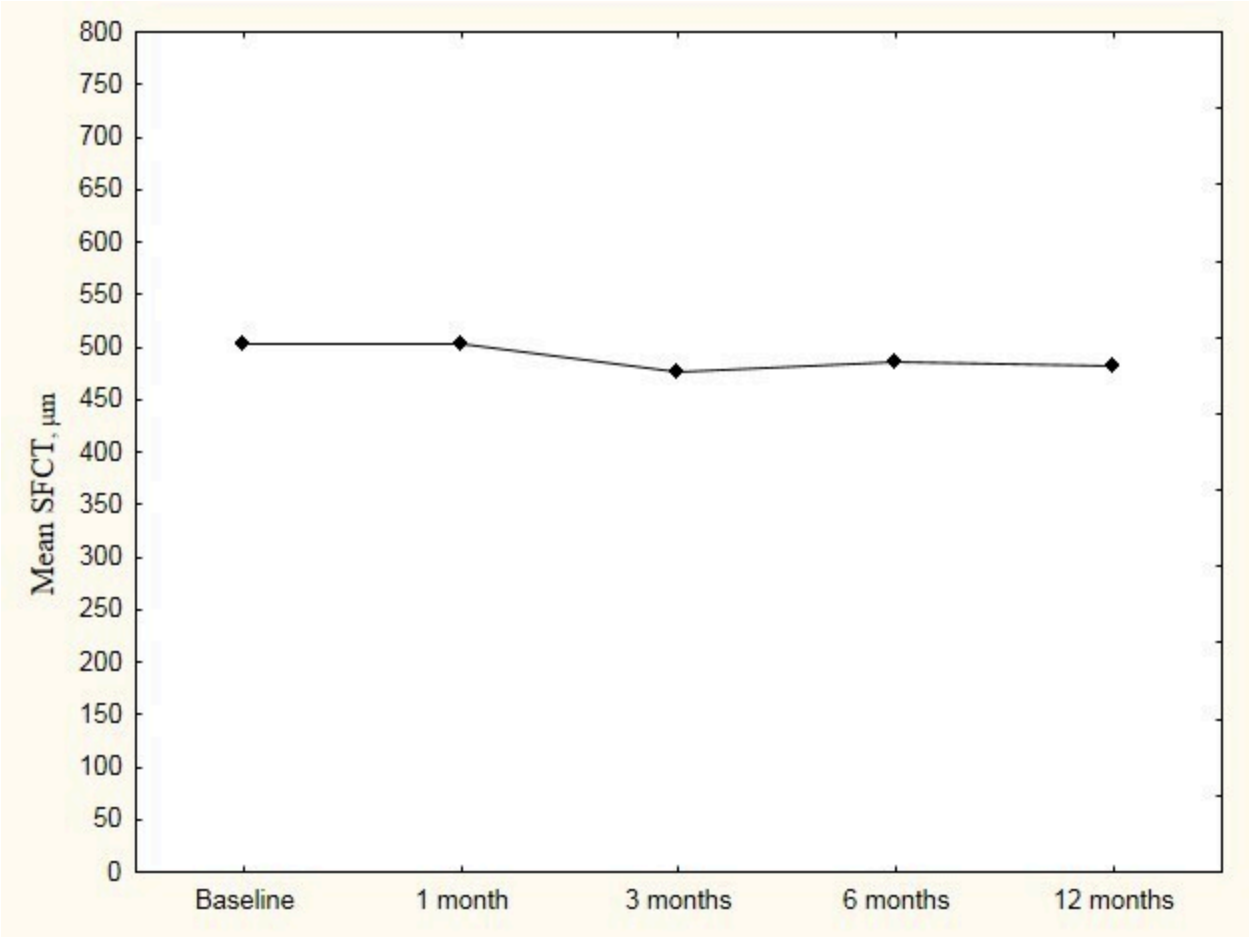


Figure 3

Change in mean subfoveal choroidal thickness (SFCT) in overall cohort of patients with chronic central serous chorioretinopathy (CSC) during 12 months of follow-up.