INFORMATION POINT OF PERIPHERAL BLOOD INDEXES IN THE DIAGNOSIS OF THE ETIOLOGY OF OPTIC NERVE DAMAGE

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Abstract. *Along with the pandemic of a new coronavirus infection, the problem of damage to the organ of vision as a result of uncompensated dyslipidemia remains relevant. With dyslipidemia, a systemic vascular lesion develops - endotheliosis. The bulbar conjunctiva and vessels of the eyeball have been sufficiently studied to date in almost all somatic conditions, including arterial hypertension, coronary heart disease, and metabolic syndrome [1]. Optic disc diseases can be divided into three main groups: inflammatory (neuritis, papillitis), vascular (optic nerve ischemia), and degenerative (optic nerve atrophy) [2]. Pathology of the optic nerve is characterized by variability of complaints and symptoms. According to researchers, in the period from 2018 to 2020, anterior ischemic optic neuropathy was more often diagnosed in people over 60 years of age [3; 4]. There is also an increase in the incidence, an increase in the number of young patients among the sick [4]. Visualization of the optic nerve head (OND) is informative for ascertaining changes in the nervous tissue and vascular bundle. Vascular and inflammatory pathologies of the optic disc during fundus ophthalmoscopy have a similar picture (edema of the optic disc and cotton wool-like edema of the retina around it; the presence of small hemorrhages in the form of stripes on the surface of the disc and in the peripapillary zone located in the layer of nerve fibers; possible formation of "soft exudate" on the surface of the optic disc) [1; 3; 4]. Macular edema should set the ophthalmologist to a multidisciplinary approach with additional laboratory studies to establish its etiology, which will determine the further tactics of patient management. So, in the presence of macular edema, it is necessary to exclude the presence of immunoinflammatory, infectious, oncological and metabolic diseases that can occur with the phenomena of vascular endotheliosis [5]. Therefore, it is not always possible to understand the etiology of the process, based only on ophthalmoscopy data. To verify the vascular or inflammatory lesions of the ONH, it is possible to use the index of peripheral blood, a marker of viral infections. In addition, it is necessary to exclude the viral etiology of the lesion leading to vascular endotheliosis.*

Keywords: *is to present a clinical analysis of the features of the course of anterior ischemic optic neuropathy against the background of a sluggish herpesvirus infection in a middle-aged patient.*

Materials and research methods. Patient B., 45 years old, was admitted to the ophthalmology department of the Regional Clinical Hospital No. 2 for emergency indications on February 14, 2022, with complaints of decreased vision, a dark spot in front of the right eye. Disease history. According to the patient, on February 1, 22, on official business, she flew on a charter flight, all the passengers of which, with the exception of her and three other people, fell ill with COVID-19. On the second day after the flight, she noted an increase in temperature to subfebrile figures during the day, she independently took antipyretic drugs. The patient was

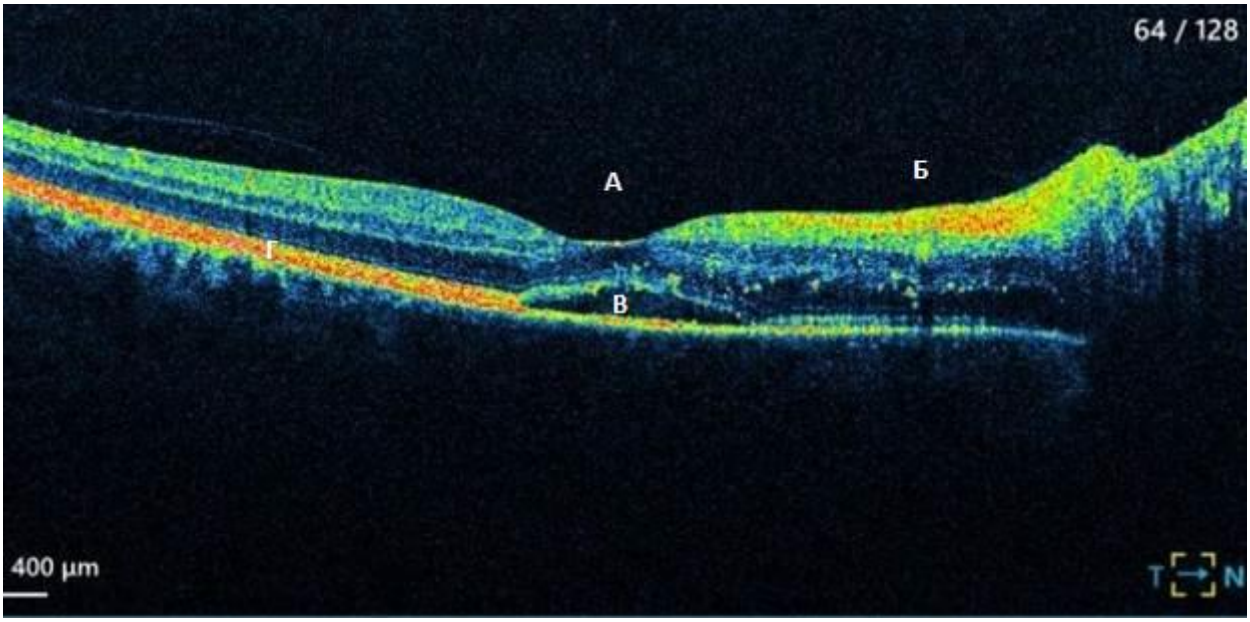
examined for a new coronavirus infection by the express method twice, the results are negative. For the first time, complaints of decreased vision in the right eye appeared on 02/08/2022, regarding which the patient applied to the Filatov Clinic, an outpatient treatment by a neurologist was prescribed for vegetative-vascular dystonia. On February 14, 2022, she noted an increase in the size of the spot in front of the eye. From the anamnesis of life it is known that the blood pressure periodically rises to 140/85 mm Hg. Art., constantly antihypertensive therapy does not receive. Denies other chronic non-communicable diseases. There were no surgical interventions. Allergological anamnesis is not burdened. He denies that he has had a new coronavirus infection. In September 2021, she was revaccinated with the Gam-COVID-Vac vaccine.

Results of the study and their discussion. Features of the patient's condition at admission: revealed the absence of pathological changes in somatic and neurological status. Local status at admission: Visus OD - 0.08 n/a; Visus OS with aperture - 1.0. OD - calm. Tonometry according to Maklakov - 18 mm Hg. Art. The cornea is transparent. The anterior chamber is of medium depth, the moisture is transparent. When examining the conjunctiva, additional vessels of the episclera in the lower inner segment of the eyeball attract attention. The pupil is medically dilated, round. The fundus reflex is pink. The fundus of the eye: the ONH is pale, edematous, the borders are blurred, it protrudes into the vitreous body. The arteries are sharply narrowed, the veins are dilated, the caliber is uneven. In the macular area there is pastosity, blurring of the macular reflex, the periphery of the retina without features. OS is calm. Tonometry according to Maklakov - 17 mm Hg. Art. When examining the conjunctiva, additional vessels of the episclera are determined in the projection of the palpebral fissure and the lower inner segment of the eyeball. The cornea is transparent. The anterior chamber is of medium depth, the moisture is transparent. The pupil is medically dilated, round. The fundus reflex is pink. The fundus of the eye: ONH is pale pink, the boundaries are clear. Arteries are moderately narrowed, veins are moderately dilated.

In the general blood test dated February 14, 2022, the percentage of monocytes was 2.5%, which is a decrease (the norm is 4–12%). All other analyzes are within the normal range. A CT scan of the brain was performed. Conclusion: CT signs of hemorrhage were not detected at the time of the study. According to the ECG - sinus rhythm, heart rate - 67 bpm. Ultrasound of the vessels of the extracranial basin on February 16, 2022: in the bulb of the internal carotid artery (ICA), the intima-media complex (IMC) was thickened up to 0.11 cm. Conclusion: initial sclerotic changes in the bulb of the ICA, data for hemodynamically significant patency disorders were not detected. Asymmetry of velocity indicators in the vertebral arteries (VA) is at the extracranial level. Ultrasound of the vessels of the intracranial basin dated February 16, 2022: a decrease in the velocity indicators of blood flow in the middle cerebral artery (MCA), anterior cerebral artery (ACA), posterior cerebral artery (PCA) on both sides. Insufficiency of blood flow in both PAs at the transcranial level. Diagnosis: anterior ischemic optic neuropathy of the right eye. Conducted the following treatment. Antispasmodic therapy - drotaverine solution for injection. 20 mg / ml, 2 ml 1 time per day intramuscularly for 3 days. Diuretic therapy - mannitol 150 mg / ml, 400 ml 1 time per day intravenously-drip for 2 days; acetazolamide 250 mg 1 pc. 2 times a day orally for 4 days. Vascular therapy - pentoxifylline 20 mg / ml 5 ml + sodium chloride 0.9% 200 ml 1 time per day intravenously drip for 6 days. Local therapy - atropine 0.1% 0.3 ml + dexamethasone 4 mg / ml 0.3 ml + lidocaine 20 mg / ml 0.3 ml 1 time per day retrobulbarno 7 days; dexamethasone 0.1%, 0.05 ml 4 times a day epibulbarno 2 days; tropicamide 10 mg/ml, 0.05 ml 1 time per day epibulbarno for 7 days.

Local status at discharge on February 21, 2022: Visus OD with a diaphragm of 0.1-0.2 n/a; Visus OS with aperture - 1.0. OD - calm. The cornea is transparent. The anterior chamber is of medium depth, the moisture is transparent. The pupil is medically dilated, round. The fundus reflex is pink. The fundus of the eye: the optic disc is pale, the edema has decreased, the boundaries have become clearer, less prominence into the vitreous body. Single dashed hemorrhages on the optic disc became less pronounced. The arteries are sharply narrowed, the veins are dilated. In the macular area, pastosity of the retina is preserved, the periphery is without features. OS is calm. The cornea is transparent. The anterior chamber is of medium depth, the moisture is transparent. The pupil is medically dilated, round. The fundus reflex is pink. The fundus of the eye: ONH is pale pink, the boundaries are clear. Arteries are moderately narrowed, veins are moderately plethoric. Macular region and periphery without features. Against the background of the treatment, the patient's vision improved, and she is discharged with improvement. Further recommendations: observation by an ophthalmologist, therapist and neurologist at the place of residence. It is recommended to continue drug therapy: dorzolamide 2% 1 drop 2 times a day - 3 weeks under the control of IOP, dexamethasone 0.1% 1 drop 4 times a day - 14 days; in both eyes methylethylpyridinol 1% 1 drop 3 times a day - 1 month; Pentoxifylline 100 mg 2 tablets 3 times a day - 3 weeks, tanakan 40 mg, 1 tab. 3 times a day - 1 month, ethylmethylhydroxypyridine succinate 125 mg, 1 tab. 3 times a day - 1 month, Semax 0.1%, 2 drops in each nasal passage 3 times a day - 7 days.

After being discharged from the hospital on February 22, 2022, the patient underwent optical coherence tomography (OCT) of the macular area and optic disc (Fig. 1), and the diagnosis of anterior ischemic optic neuropathy with macular edema of the neuroepithelium of the right eye was confirmed. It is recommended to continue the course of conservative therapy in full.

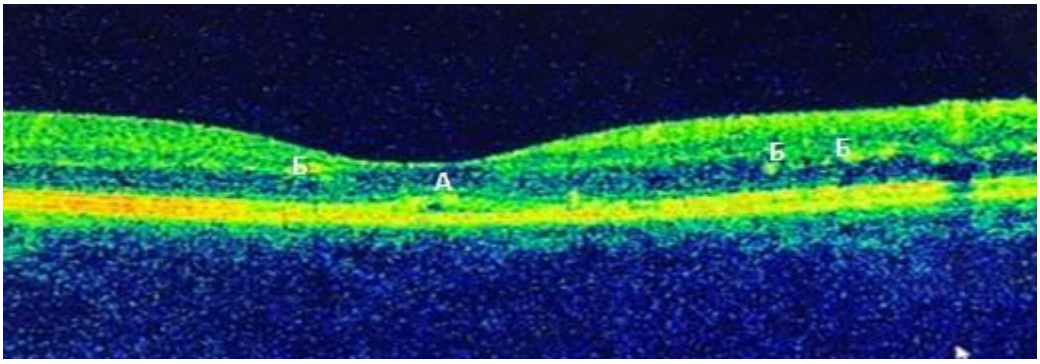


Rice. Fig. 1. Optical coherence tomography of the macular area of the right eye (02/22/2022): the foveolar depression is deformed (A); the thickness of the retina is increased in the internal sector, edema of the retinal neuroepithelium extending from the optic disc (B); slit-like detachment of the retinal neuroepithelium is determined subfoveolarly (B); the retinal pigment epithelium is not changed (D)

Further, on February 24, 2022, the patient went for a consultation with an ophthalmologist at the University Multidisciplinary Clinic of Tyumen State Medical University. From the data of

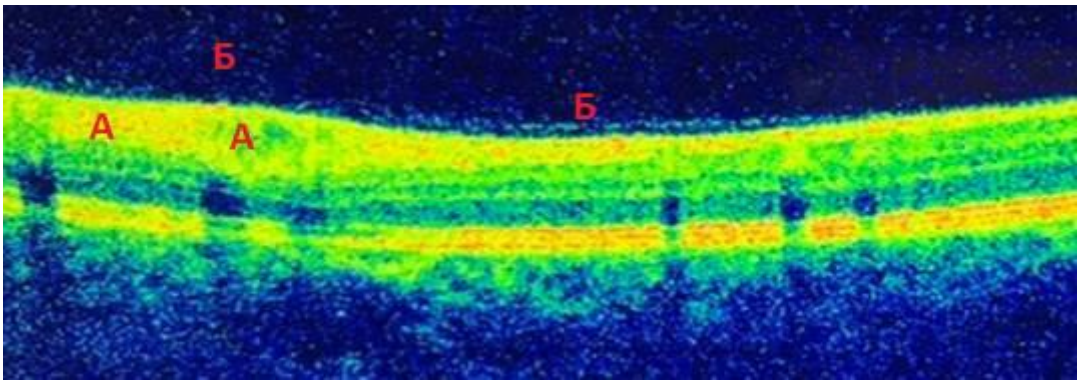
the submitted medical documentation, it was found that the patient is being observed by an endocrinologist. The conclusion of the endocrinologist: multinodular (non-toxic) goiter. WHO-I. Follicular tumor of the right lobe of the thyroid gland (Bethesda IV). Regarding thyroid disease, she was consulted at the National Research Center for Endocrinology of the Ministry of Health of Russia, with recommendations for dynamic monitoring without drug correction. According to the general blood test, the leukocyte index was calculated at the time of admission of the patient to the ophthalmological department (02/14/2022) and in dynamics at the time of the examination according to the following formula. Viral infection marker (MVI) = (lymphocytes %) / (monocytes %). MVI - 12.2 when contacting the ophthalmology department. The results of the analyzes revealed the following indicators. Complete blood count dated February 23, 2022 was within the normal range, MVI - 3.1. In a biochemical blood test dated February 23, 2022, a borderline value of triglycerides was revealed - 2.19 mmol / l, a borderline value of total cholesterol - 5.8 mmol / l, HDL - 0.85 mmol / l (low level), and a high level was also detected. the LDL level is 4.3 mmol/l, which indicates the presence of a lipid metabolism disorder in the patient. The D-dimer index was 652 ng/ml (against the norm in non-pregnant women less than 443 ng/ml). An increase in D-dimer indicates a violation of the blood coagulation system, which may be present in infectious, inflammatory, autoimmune diseases that occur in the body, and requires further examination. No changes were noted in the ophthalmological status. Taking into account changes in the vessels of the bulbar conjunctiva (additional vessels of the episclera), changes in the vessels of the retina of both eyes, and laboratory data, the patient was diagnosed with ocular ischemic syndrome in both eyes (against the background of dyslipidemia). Anterior ischemic neurooptic opathy of the right eye due to sluggish viral infection of herpes simplex type 1. Multinodular (non-toxic) goiter. WHO-I. Follicular tumor of the right lobe of the thyroid gland (Bethesda IV). An additional examination was prescribed to clarify the etiology of the process and the state of the somatic status: quantitative analysis of saliva by PCR for herpes simplex virus type 1, 2, 6, Epstein-Barr, cytomegalovirus; quantitative analysis of peripheral blood for toxoplasmosis, followed by consultation with an infectious disease specialist. Re-examination of retinal OCT and autofluorescence of both eyes. The treatment was corrected before the results of the examination. Added topically: ophthalmoferon solution 1 drop 6 times a day for 3 days, then 4 times a day up to 1 month; bromsinac solution morning, evening for 2-3 months, right eye. Systemically: acyclovir tablets 400 mg 4 times a day for 10 days. Pressure chamber No. 5. Molecular diagnostics by PCR revealed herpes simplex virus type 1 (HSV 1) 5.7x104 copies/sample. On February 27, 2022, the patient was examined by an infectious disease specialist. The following diagnosis was made: herpes simplex virus type 1, primary acquired form, reactivation. Anterior ischemic optic neuropathy of the right eye. Biliary sludge (according to the results of ultrasound of the abdominal organs). Recommended treatment: valacyclovir 1000 mg 1 tablet 3 times a day for 10 days, Viferon 1000000 IU 1 suppository 2 times a day for 14 days, amixin 125 mg 1 tablet 1 time a day for the first 2 days, then 1 tablet every 48 hours , 20 tablets per course of treatment, ophthalmoferon 1 drop 5 times a day epibulburn 7 days, vitamin D 500 U 1 drop 1 time a day for a long time, ursosan 250 mg 3 capsules a day for 3 months. On March 10, 22, the patient was invited for a follow-up examination by an ophthalmologist during treatment by an infectious disease specialist. According to the results of optical coherence tomography of the macular zone (Fig. 2, 4) and autofluorescein angiography (Fig. 3, 5) of both eyes, the bilateral process is confirmed. Structural OCT images of the right eye revealed positive dynamics - regression of macular edema, the left eye - an active

process is determined in the vitreous body adjacent to the retina, intrastromal inclusions. On angiography, the arteries are moderately narrowed, the veins are moderately full-blooded, along the upper vascular arcade of the left eye, vascular anomalies and hyperfluorescent spots on the posterior pole of the foveolar and parafoveolar areas of both eyes corresponding to the foci of accumulation of lipofuscin are determined.



Rice. 2. Optical coherence tomography of the macular area of the right eye (03/10/2022): residual edema of the neuroepithelium is determined subfoveolarly (A); intrastromal inclusions (B)

Rice. Fig. 3. Autofluorescein angiography of the right eye (March 10, 2022): hyperfluorescent spots on the posterior pole of the foveolar and parafoveolar areas corresponding to the foci of lipofuscin accumulation (A)



Rice. Fig. 4. Optical coherence tomography of the macular zone of the left eye (03/10/2022): intrastromal inclusions (A), parietal inclusions in the vitreous body (B)

Rice. 5. Autofluorescein angiography of the left eye (March 10, 2022): hyperfluorescent spots on the posterior pole corresponding to foci of lipofuscin accumulation in the foveolar and parafoveolar regions (A); vascular anomalies (B)

Thus, the presence of an ocular ischemic syndrome in a patient with an interest in the posterior pole of the eyeball (ON and macular area) against the background of an increase in temperature to subfebrile numbers during the day should alert the doctor regarding the reactivation of a previously acquired herpes simplex virus type 1.

Conclusions. A clinical example demonstrates the presence of anterior ischemic optic neuropathy in a patient against the background of a sluggish herpesvirus infection, which can confirm the optic disc edema, its pallor, prominence into the vitreous body, single streaky hemorrhages on the optic disc, pastosity of the macular zone of the retina. It was possible to suspect a viral etiology of damage to the optic nerve head based on the calculation of the peripheral blood index, in particular, a marker of viral infections, the value of which was 12.2 upon the manifestation of clinical manifestations. A multidisciplinary approach is needed to diagnose and treat these patients in order to prevent vision loss and improve quality of life.

REFERENCES

1. Касимова М.С., Махкамова Д.К.,Жалалова Д.З.Эндотелин-1 ва гомоцистеин даражасини артериал гипертензия фонида тўр парда ўзгаришларида эндотелиал дисфункциянинг маркерлари сифатида текшириш Журнал «Биомедицина ва амалиет». Тошкент - 2021, Том № 6,№5. С. 203-210
2. Жалалова Д.З., Махкамова Д.К Мультикомпонентный подход к диагностике изменений сетчатки при артериальной гипертензии Журнал «Проблемы биологии и медицины» – 2021. №5 С – 205-211.
3. Жалалова Д.З., Махкамова Д.К.ОКТ- ангиография при оценке сосудистого русла сетчатки и хориоидеи Журнал «Проблемы биологии и медицины»– 2021. №6 С – 211-216.
4. Zhalalova D.Z.The content of endothelin and homocysteine in blood and lacrimal fluid in patients with hypertensive retinopathy Web of Scientist:International Scientific Research Journal Volume 3,ISSUE 2,February-2022,C. 958-963
5. Zhalalova D.Z. Modern aspects of neuroprotektive treatment in hypertensive retinopathy Web of Scientist:International Scientific Research JournalVolume 3,ISSUE 2,February-2022,C. 949-952

6. Zhalalova D.Z.Development of classification criteria for neuroretinal ischemia in hypertension Web of Scientist:International Scientific Research Journal Volume 3,ISSUE 2,February-2022,C. 972-978
7. Жалалова Д.З.Классификационные критерии изменений сосудов сетчатки при артериальной гипертензии Журнал «Проблемы биологии и медицины» – 2022. №1 С – 50-53.
8. Жалалова Д.З.Диагностические критерии оптической когерентной томографии с функцией ангиографии при ишемических заболеваниях органа зрения на фоне артериальной гипертензии Журнал «Проблемы биологии и медицины» – 2022. №5 С –73-78
9. Жалалова Д.З.Оценка маркеров эндотелиальной дисфункции в слезной жидкости у пациентов с артериальной гипертензией Журнал «Биомедицина ва амалиет». Тошкент - 2022, Том № ,№. С.
10. Жалалова Д.З. ОКТ-ангиография в оценке ретинальной и хореоретинальной микроциркуляции у пациентов с неосложненной артериальной артериальной гипертензией Международный офтальмологический конгресс IOC Ташкент 2021,С 95-96
11. Жалалова Д.З. Современные аспекты нейропротекторного лечения при гипертонической ретинопатии Журнал ТМА – 2022. № 4 С 84-87
12. Zhalalova D.Z.Magnetic Resonance Tractographyas a Method of Choice for Neuroimaging in ocular ishemic syndrome against the background jf hypertension Central Asian Journal of medical and natural sciences Vol 3 ISSUE 2, Mar-Apr 2022, C 207-210
13. Zhalalova D.Z.Development of classification criteria for neuroretinal ischemia in arterial hypertension Central Asian Journal of medical and natural sciences Vol 3 ISSUE 3, May-Jun 2022, C 59-65
14. F. Shernazarov РОЛЬ С–РЕАКТИВНОГО БЕЛКА В ПАТОГЕНЕЗЕ СОСУДИСТЫХ ЗАБОЛЕВАНИЙ ОРГАНА ЗРЕНИЯ У БОЛЬНЫХ АРТЕРИАЛЬНОЙ ГИПЕРТЕНЗИЕЙ // SAI. 2022. №D8. URL: https://cyberleninka.ru/article/n/rol-s-reaktivnogo-belka-v-patogeneze-sosudistyh-zabolevaniy-organa-zreniya-u-bolnyh-arterialnoy-gipertenziey (дата обращения: 27.01.2023).
15. F. Shernazarov СОЧЕТАННАЯ СТОМАТОЛОГИЧЕСКАЯ И ГЛАЗНАЯ ПАТОЛОГИЯ // SAI. 2022. №D8. URL: https://cyberleninka.ru/article/n/sochetannaya-stomatologicheskaya-i-glaznaya-patologiya (дата обращения: 27.01.2023).