IJACT, Volume 2, Issue 11, 2024 ISSN: 2995-5378
http://medicaljournals.eu/index.php/IJACT

INTERNATIONAL JOURNAL OF ALTERNATIVE AND CONTEMPORARY THERAPY

New Technologies in Diagnostics of Dry Eye Syndrome: Prospects of Use

Jalalova Dilfuza Zuhridinovna
Department of Ophthalmology, Samarkand State Medical University

Yaxshinorov Islom
Samarkand State Medical University, Department of Ophthalmology, 1st year clinical ordinator

Abstract: Dry eye syndrome (DES, corneal-conjunctival xerosis) is an inflammatory damage to the cornea and conjunctiva caused by a decrease in the amount of tears and a change in their chemical composition. The disease is typical for residents of developed countries - the prevalence of pathology among Russians is 15-17%. Most often these are adults, but among the patients there are also children and adolescents. The proportion of diseases increases with age - among men and women under the age of 40, dry eye syndrome is detected in 12% of people, after the age of 50 - in 60%. The disease not only causes discomfort, but also increases the risk of developing infectious inflammation of the eye and contributes to a decrease in vision. In this article, we will talk about the causes, symptoms and treatment of dry eye syndrome.

Keywords: Types of corneal-conjunctival xerosis, Signs and symptoms of the disease, Classification of dry eye syndrome by causes.

Classification of the causes of dry eye syndrome:

Symptomatic - as a symptom (consequence) of some hormonal and somatic diseases, lack of vitamin A, postoperative conditions in the eyes, side effects of drug therapy.

Syndromic - as a self-limiting disease.

Artificial is not a symptom or a disease, but the result of the influence of external factors. After destroying them

Types of VIT according to the mechanism of development:

Xerophthalmia is caused by a decrease in the amount of tear fluid produced.

It occurs as a result of a violation of the formation of the tear film on the surface of the eye or increased evaporation of tears.

Combined - caused by a combination of the factors listed above.

Types of dry eye syndrome according to clinical appearance:

Filamentous keratitis is an inflammation of the cornea, which is accompanied by the formation of filamentous tumors attached to the corneal epithelium at one end.

Keratoconjunctivitis sicca is an inflammation of the conjunctiva and cornea, characterized by dryness and keratinization of the membranes.

Repeated erosion of the cornea - dry eye syndrome, accompanied by excessive desquamation of corneal cells.

A cherotic corneal ulcer is a disease in which a corneal defect is formed, contains the stroma, and tends to develop.

Keratitis (inflammation of the cornea) caused by not closing the eyes. When you blink, the membranes are moistened with tears, and if you do not blink, the surface of the eye dries out.

Cicatricial pemphigoid is a rare disease of an autoimmune nature, characterized by the appearance of bubbles on the mucous membrane of the eye, which later form a scar.

Xerosis associated with vitamin A deficiency.

Classification of dry eye syndrome by severity:

Mild - the stability of the tear film decreases, microscopic signs of xerosis are noted.

It is distinguished from moderate-mild DES by an additional decrease in tear production.

Severe - there are signs of macroscopic (visible with the naked eye) xerosis, the production of tear fluid and a stable film is significantly reduced.

Especially severe - there is a risk of corneal perforation and loss of vision due to a sharp decrease in the stability of the tear film.

How and why DES evolves

To understand what dry eye syndrome is and why it develops, we describe the structure and functions of the tear film. It is about 10 microns thick and consists of 3 layers:

Lipid - external, prevents evaporation of tears. It is formed from the secretion of the meibomian glands located on the edges of the upper and lower eyelids.

Aqueous - medium, moisturizes the eyes. Produced by lacrimal glands.

Mucous - internal, ensures adhesion of the tear film to the surface of the eye membranes. Mucin is produced by special glass-shaped cells of the cornea.

It is enough for one of the joints involved in its formation to fall so that the tear film becomes thinner and can no longer cope with moistening the eye. Therefore, the development of dry inflammation is often caused by diseases that reduce the production of lipids, tear fluid or mucins. What can disrupt these processes:

diseases of the endocrine system (diabetes mellitus, thyroid gland pathologies);

vitamin deficiency (vitamin A deficiency);

anemia (iron deficiency and other forms);

infections of the cornea, lacrimal glands, or meibomian glands;

Sjögren's syndrome;

hormonal changes (pregnancy, menopause);

mechanical injuries, thermal and chemical burns of the eyes;

taking certain medications (beta-blockers, diuretics, oral contraceptives, etc.).

Another reason for the development of dry eye syndrome is the rapid evaporation of tear fluid. This can be caused by:

lagophthalmos (not closing the eyelids);

use of soft contact lenses;

spending too much time on computer screens, phones and other devices;

exposure to wind, including a fan or air conditioner;

exposure to smoke, dust and other irritating factors.

People over 40-50 years old are at risk, especially those who spend a lot of time at the computer due to their profession.

Signs and symptoms of the disease

The main symptom of dry eye syndrome is dryness of the conjunctiva and cornea. It is manifested by discomfort in the eyes, which is a consequence of increased friction of the eyelids on the mucous membrane. When the tear film becomes too thin, there is a burning sensation, a feeling of sand or a foreign body. Against the background of dryness, there is a temporary increase in the production of tear fluid - lacrimation begins, but this does not lead to an improvement in the situation due to the instability of the formed film. Symptoms increase in the evening or under the influence of an eye-irritating factor - wind, smoke, eye drops.

Other possible symptoms of dry eye syndrome:

Redness of the conjunctiva.

Tired eyes, worse in the evening.

Changes in visual acuity during the day.

Increase the sensitivity of the eyes to light.

Symptoms may not appear constantly, but occasionally, when the eyes experience maximum stress or are exposed to harmful factors.

Diagnostic methods

The first thing an ophthalmologist does when dealing with a patient with suspicion of dry eye is to conduct a survey, collect anamnesis, and perform an examination to identify symptoms characteristic of dry eye syndrome. The doctor determines the causes and severity of the disease by conducting the following studies:

Analysis of tear fluid allows to evaluate its microbiological and chemical composition.

Biomicroscopy - assessment of the height of the tear meniscus and the condition of the cornea.

The Schirmer test is a method of assessing the rate of tear production using a litmus strip.

The Norn test is a method of estimating the rate of evaporation from the surface of the eye. If you have dry eye symptoms, drops that color the tear film can help you understand how quickly it evaporates.

When diagnosing dry eye syndrome, an ophthalmologist looks for symptoms that are characteristic of it. If mucin threads are detected, tear meniscus reduction, corneal erosion, insufficient tear production or rapid evaporation, the diagnosis is confirmed.

Methods of treatment of dry eye syndrome

It is not possible to completely cure dry eye syndrome, but it is possible to eliminate its symptoms and prevent their occurrence in the future. Regardless of the cause of dry eye syndrome, treatment always includes the use of eye drops to moisten the surface of the conjunctiva and cornea. They form a stable tear film and eliminate dryness. For mild symptoms of dry eye syndrome, the ophthalmologist prescribes low-viscosity agents. In severe cases, treatment of dry eye syndrome with medium-viscosity drops or gel-like preparations is indicated.

For severe symptoms of dry eye syndrome, the doctor also prescribes treatment with drops that have anti-inflammatory, metabolic and immunostimulating effects. They help to eliminate the effects of dry membranes and prevent changes in the cornea that can cause vision impairment.

Treatment with drops for dry eye syndrome is the main, but not the only, method of combating dryness. If conservative treatment is not effective enough, the ophthalmologist may recommend surgery. Types of operations performed for dry eye syndrome:

Blocking the tear ducts - they stay on the surface of the eye longer. The operation can be performed in different ways, but usually the tear ducts are closed with silicone plugs - this is a minimally invasive and safe method.

Keratoplasty is an operation aimed at eliminating defects of the cornea and restoring its shape and functions. This is done in the case of pathological changes in the cornea, ineffectiveness of conservative therapy and closure of the lacrimal ducts.

Lateral tarsorrhaphy is an operation aimed at reducing the evaporation of tear fluid. It is performed in patients with incomplete eyelid closure. The surgeon sews the upper and lower eyelids in the outer corner. After that, the palpebral fissure begins to close completely when blinking, so the entire front surface of the eye is wet with tears.

Treatment for dry eye syndrome may include transplantation of the patient's own salivary glands or the installation of soft tissue dacryoreservoirs with a tube inserted into the conjunctival cavity.

The main goal in the treatment of dry eye syndrome (DES) is to preserve the cornea, protect its structures from damage and reduce discomfort. Several treatment methods can be used at the same time.

Ophthalmologists distinguish several types of therapy for the treatment of dry eye syndrome.

- Reparative therapy to eliminate damage to the eye surface. Reparative drugs are aimed at restoring damaged areas. Usually these are ointments and gel-based products.

Tear replacement therapy aims to replace insufficient tear volume and prevent tear film rupture. Many drugs contain hyaluronic acid.

Tear conservation therapy allows you to conserve your own tears. Therapy is prescribed as an adjunct to drug treatment and very often as an alternative to eye drops. Occluders are installed in lacrimal holes, some of them dissolve by themselves;

Anti-inflammatory therapy relieves inflammation and prevents the development of the disease. To supplement natural tear production, tetracyclines, cyclosporine drops, and anti-inflammatory drugs are prescribed.

Stimulation therapy restores and normalizes the activity of the secretory glands. Usually these are dietary supplements - omega-3, mineral complexes, vitamins.

Physiotherapy stimulation, therapeutic effects methods are used to release natural tear production:

exposure to polychrome light;

laser stimulation;

magnetic stimulation;

subconjunctival administration of drugs with autologous blood plasma - PRP technology.

The frequency and number of physiotherapy sessions depends on the level of dysfunction, the stage of the syndrome and the dynamics of the result. One of the causes of dry eye syndrome is a malfunction of the meibomian glands. Conservative methods are used for treatment - eyelid hygiene and warm compresses. Ophthalmologists also prescribe antibiotics, fatty acids, anti-inflammatory drugs, demodex infestation control, and hormonal therapy.

Preventive measures

To prevent the development of dry eye syndrome and reduce the symptoms of the existing disease, you need:

Monitor your blink rate during reading, computer work, and other activities that require increased visual attention.

If possible, reduce the time spent on the computer, phone, tablet, TV, books, etc.

Keep your computer monitor or phone screen below eye level.

Maintain normal air humidity in buildings (50-60%). You can use humidifiers for this.

Avoid using eye drops that contain preservatives.

Avoid harmful effects on the eyes (e-cigarette vapor, tobacco smoke).

Do not use contact lenses for longer than recommended by the manufacturer.

Optimizing working conditions. The risk of DHS is high among firefighters, cooks, auto repair workers, paramedics, miners, welders, construction workers: those who work with extreme temperatures, dust, fumes and chemical fumes. Prevention consists in reducing the effects of harmful working conditions. For example, if the work involves dust, wear construction goggles.

Pay attention to air humidity. The room should have optimal air humidity - at least 50-60%. If the figure drops below 30%, consider purchasing a humidifier. Additional helpers will be indoor plants and regular wet cleaning.

Reduce the time spent on a computer, tablet or smartphone. When working at the computer for a long time, the frequency of blinking decreases and the strain on the eyes increases. Editors, office workers, copywriters, IT professionals and designers are at risk. If your work is related to the computer and it is not possible to reduce screen time, do not forget about regular eye exercises and proper organization of your workplace. Try not to take other gadgets while on vacation, but look at the distance. Also, take care of adjusting the screen (you can reduce the brightness) and the proper lighting of the room (you can install blinds and thick curtains to prevent glare on the screen).

The risk of developing dry eye syndrome is reduced by following a drinking regimen and proper nutrition enriched with vitamins and minerals. Timely detection and treatment of diseases of the endocrine system is important for eye health.

Summary

Dry eye syndrome is a disease whose main symptoms are dryness and associated discomfort. Tear glands develop when they do not produce enough fluid to lubricate the cornea and conjunctiva, or for some reason, the fluid evaporates too quickly. According to the diagnostic results, only a doctor can tell you how to get rid of dry eye syndrome. Self-treatment is not allowed, because it only relieves the symptoms of dry eye syndrome, and worse, worsens its course. Therefore, if your eyes are dry or burning, you should consult an ophthalmologist.

Diagnosis and treatment of dry eye syndrome in Moscow is carried out in the network of Mositalmed clinics. Call to make an appointment with an ophthalmologist or submit an online request for a call back.

Sources

1. Yanchenko SV, Malyshev AV, Odilova GR, Petrosyan LM, Odilov M.Yu. New options for the treatment of hyposecretory dry eye syndrome // Ophthalmology, No. 20 (3) - 2023. Source: ophthalmojournal.com
2. Maychuk D.Yu., Loskareva AO Features of treatment of patients with dry eye syndrome, including corneal epithelization disorders // Ophthalmology, No. 16 (4) - 2019. Source: ophthalmojournal.com
3. Долиев, М. Н., Тулакова, Г. Э., Кадырова, А. М., Юсупов, З. А., & Жалалова, Д. З. (2016). Эффективность комбинированного лечения пациентов с центральной серозной хориоретинопатией. Вестник Башкирского государственного медицинского университета, (2), 64-66.
4. Zukhridinovna, Z. D. (2022). Modern aspects of neuroprotective treatment in hypertensive retinopathy.
5. Jalalova, D., Raxmonov, X., & Shernazarov, F. (2022). THE ROLE OF C-REACTIVE PROTEIN IN THE PATHOGENESIS OF VISUAL VASCULAR DISEASES IN PATIENTS WITH ARTERIAL HYPERTENSION. Science and Innovation, 1(8), 114-121.

6. Jalalova, D., Raxmonov, X., & Shernazarov, F. (2022). SIGNIFICANCE OF ENDOTHELIAL DYSFUNCTION IN THE DEVELOPMENT OF RETINOPATHY IN PATIENTS WITH AH AND WAYS OF ITS CORRECTION. Science and Innovation, 1(8), 101-113.
7. Jalalova, D., Axmedov, A., Kuryazov, A., & Shernazarov, F. (2022). COMBINED DENTAL AND EYE PATHOLOGY. Science and innovation, 1(8), 91-100.
8. Саттарова, Х. С., Жалалова, Д. З., & Бектурдиев, Ш. С. (2011). Причины слепоты и слабовидения при сахарном диабете. Академический журнал Западной Сибири, (6), 27-28.
9. Arunachalam, S. (2008). The science race continues in Asia. Current Science (00113891), 94(7).
10. Zukhriddinovna, Z. D. (2022). Development of Classification Criteria for Neuroretinal Ischemia in Arterial Hypertension. Central Asian Journal of Medical and Natural Science, 3(3), 59-65.
11. Жалалова, Д. З., & Исмоилов, Ж. Ж. (2024). ТЕОРЕТИЧЕСКОЕ ОБОСНОВАНИЕ ИССЛЕДОВАНИЯ ЭНДОТЕЛИНА-1 И Д-ДИМЕРОВ В КРОВИ И СЛЕЗНОЙ ЖИДКОСТИ ПАЦИЕНТОВ С ГИПЕРТОНИЧЕСКОЙ АНГИОРЕТИНОПАТИЕЙ. AMALIY VA TIBBIYOT FANLARI ILMIY JURNALI, 3(3), 294-299.
12. Киселева, Т. Н., Ежов, М. В., Аджемян, Н. А., Танковский, В. Э., & Ильина, Н. В. (2016). Особенности регионарного глазного кровотока при артериальной гипертензии I-II степени и субклиническом атеросклерозе. Российский офтальмологический журнал, 9(3), 26-33.
13. Жалалова, Д. З., Кадирова, А. М., & Хамракулов, С. Б. (2021). Исходы герпетических кератоувеитов на фоне лечения препаратом «офтальмоферон» в зависимости от иммунного статуса пациентов. междисциплинарный подход по заболеваниям органов головы и шеи, 103.
14. Дроздова, Е. А., & Хохлова, Д. Ю. (2015). Морфометрическая характеристика макулярной зоны у пациентов с окклюзией вен сетчаткипо данным оптической когерентной томографии. Медицинский вестник Башкортостана, 10(2 (56)), 64-67.
15. Jalalova, D., Axmedov, A., Kuryazov, A., & Shernazarov, F. (2022). СОЧЕТАННАЯ СТОМАТОЛОГИЧЕСКАЯ И ГЛАЗНАЯ ПАТОЛОГИЯ. Science and innovation, 1(D8), 91-100.
16. Zhang, S., & Melander, S. (2014). Varicose veins: Diagnosis, management, and treatment. The Journal for Nurse Practitioners, 10(6), 417-424.
17. Жалалова, Д. З., & Бабаев, С. А. (2024). РЕЗУЛЬТАТЫ ОЦЕНКИ УРОВНЯ ЭНДОТЕЛИНА-1 И Д-ДИМЕРОВ В СЛЕЗНОЙ ЖИДКОСТИ У ПАЦИЕНТОВ С АРТЕРИАЛЬНОЙ ГИПЕРТЕНЗИЕЙ. AMALIY VA TIBBIYOT FANLARI ILMIY JURNALI, 3(3), 300-307.
18. Zukhriddinovna, Z. D. (2022). Development of Classification Criteria for Neuroretinal Ischemia in Arterial Hypertension. Central Asian Journal of Medical and Natural Science, 3(3), 59-65.
19. Tatarnikova EB, Krivosheina OI Dry eye syndrome: modern aspects of etiology and pathogenesis // Breast cancer. Clinical Ophthalmology, Volume 20, No. 3 - 2020. Source: cyberleninka.ru
20. Loskutov IA, Korneeva AV Diagnosis and treatment of dry eye syndrome in outpatient settings // Effective Pharmacotherapy, Volume 15, No. 33 - 2019. Source: elibrary.ru
21. Brjesky VV, Popov V.Yu., Kalinina NM, Brjeskaya IV Prevention and treatment of degenerative changes in the ocular surface epithelium in dry eye syndrome // Bulletin of Ophthalmology, Volume 134, No. 5 - 2018. Source: elibrary. ru