CartoGeodesy: Journal of Geodetic and Cartography Horizons
e-ISSN: xxxx-xxxx Vol.1 Issue 2|2024

Review of Monographs on Etiology, Diagnosis and Treatment of Dry Eye Syndrome

Sh. Z. Kodirova
1st stage graduate student of the Institute of Pharmaceutical Education and Research, Department of Experimental and Sports Pharmacology

S. A. Saidov
Doctor of Medical Sciences, Professor of Pharmaceutical Education and Research Institute

J. O. Mirsultanov
Senior Research Fellow, Institute of Pharmaceutical Education and Research

R. R. Kuchkarova
TDPU named after Nizami, candidate of chemical sciences

Abstract: This article talks about the methods of diagnosis and treatment of "Dry eye" syndrome, which is currently spreading among all strata of the population due to various factors, proposed by researchers-scientists in their scientific works, in particular, in their monographs, and used in practice.

Keywords: "Dry eye" syndrome,Mark S. Milner,dysfunctional tear syndrome (DTS), differential diagnosis, American Academy of Ophthalmology.

Monograph "Dysfunctional Tear Syndrome: Dry Eye Disease and Tear Film Disorders - New Strategies for Diagnosis and Treatment" by Mark S. Milner et al."Dry eye" syndrome is devoted to new methods of diagnosis and treatment. This monograph first focuses on this disease, stating that dysfunctional tear syndrome (DTS) is a common and complex condition affecting the ocular surface[1]. The main goal of studying this syndrome is to provide a new approach to achieve better results in the treatment of patients with this disease through differential diagnosis and targeted treatment. For this purpose, the study of the etiology of the syndrome began with the determination of changes in the quality and quantity of the tear film, in which the disease was determined to be caused by a number of etiologies, and abnormalities in one or more components of the tear film were identified. included. Any change in the quantity or quality of the tear film can lead to this condition, Dry Eye Syndrome (DED) and several associated tear film disorders. includesNichols KK et alfound that if the syndrome is not properly diagnosed or treated, it can lead to a profound reduction in quality of life and activities based on visual functions (eg, reading and computer use)[2]. In addition, scientists of the American Academy of Ophthalmology found that the syndrome can negatively affect the results of surgical procedures such as cataract and refractive surgery procedures [3,4]. The monograph under study provides detailed information on differential diagnostic methods that allow identifying and treating specific types and symptoms of this disease [1]."Dry eye" syndrome is mainly classified into four main types:

the first is a decrease in the amount of tears;

the second, blepharitis;

third, goblet cell deficiency;

and the fourth is related to the lack of mucin cells.

After clinical evaluation and assessment of a patient with dry eye syndrome, each patient can be divided into one or more subtypes of the disease state (the presence of several subtypes in the patient is determined). It is important to identify and eliminate the factors that lead to "dry eye" syndrome. Diagnosis and treatment with differential diagnostic methods are carried out in the following order:

Table 1. Patient history

Important information to collect from patients with potential DTS
Medical history
Ocular history, including surgical history and contact lens use
Systemic medications
Ocular medications
Allergies
Chief complaints or current symptoms
Prior and current therapy for treatment of DTS

DTS, dysfunctional tear syndrome.

Step 1: Take a medical history: Table 1 summarizes the types of information that should be collected from a patient with the syndrome. A complete medical and eye history, including surgical history, is necessary to evaluate the patient:

Ophthalmological drugsThe information about when and in which disease and in which order it was taken is also important at this stage. To treat the syndrome, the patient should be asked and recorded about the treatments prescribed for blepharitis and any allergies. The main complaints reported by the patient and the time and condition of the treatments help to make a preliminary conclusion on the classification of the types of the syndrome.

Table 2. Preliminary assessments performed by the technician or clinician

Clinical assessments and diagnostic measures used as part of the preliminary examination
Visual acuity (with and without glasses/lenses)
Refraction evaluation – best-corrected visual acuity
Administer a questionnaire (e.g., OSDI and SPEED)
Tear osmolarity[a] – must be conducted before disturbing the eye
Assess inflammatory markers present in the tear film (MMP-9)[a]
Schirmer test with and/or without anesthesia (clinician preference)

MMP-9, matrix metalloproteinase-9; OSDI, Ocular Surface Disease Index; SPEED, Standard Patient Evaluation of Eye Dryness.
[a]If available.

Step 2: Initial assessment. Other members of the clinic or office staff may perform the initial assessment of the patient with the syndrome. Table 2 lists the preliminary evaluations suggested by the authors:

Consistency between staff members during each assessment is important because the results of diagnostic tests at the initial examination provide a basis for comparison with subsequent examinations.Monte´s-Mico´ R.patients with the syndrome often report blurred vision or intermittent visual disturbances[5]. Thus, assessing the patient's visual acuity with and without glasses or lenses and evaluating any conditions necessary to maximize visual acuity are an important part of the initial evaluation. In addition to assessing visual acuity, patients should be asked about the status and timing of any changes.Bron AJ et alfound that tear film osmolality can be assessed before any further assessment of visual acuity is performed if the necessary equipment is available [6,7]. After this assessment, the relative degree of ocular inflammation (common among all subtypes of the syndrome) can be assessed, as measured by levels of inflammatory mediators such as matrix metalloproteinase (MMP)-9 in the tear film[8 ,9].Savini Get al found that a patient's relative tear volume and secretion can be measured using the Schirmer strip test [7].

Table 3. Primary assessments and diagnostic procedures performed by the clinician

Clinical assessments and diagnostic measures used by the clinician
Review of patient's medical and ocular history, including responses to questionnaire
Review of past/current medication use
External examination: particular emphasis on the lid, lid closure, and blinking (complete and incomplete)
Slit-lamp examination
Lids and lashes (lids should be everted)
Anterior segment – ocular surface
Tear meniscus
Instill fluorescein dye; observe staining pattern on cornea and TBUT
Instill lissamine green and/or rose bengal; observe staining pattern on the conjunctiva and cornea
Evaluation and expression of meibomian glands

TBUT, tear break-up time.

Step 3: Initial Assessment. The doctor will perform the initial evaluation and tests that are usually used to diagnose the syndrome. Table 3 summarizes the following primary evaluation and diagnostic procedures recommended at this stage;

Table 4. Additional assessments and diagnostic procedures

Clinical assessments and diagnostic measures that provide additional information that may be helpful in determining a differential diagnosis
Corneal sensation
Corneal topography
Tear film imaging
Evaluation of the tear film lipid layer
OCT: evaluation of the tear meniscus
Functional tear analysis light scatter
Imaging of the meibomian glands
Serum antibody biomarkers and/or other serological tests
Cultures from the ocular surface or associated tissue

OCT, optical coherence tomography.

Step 4: Additional diagnostic tests. Based on the patient's history, results, and results of previous diagnostic procedures, additional testing may be necessary or helpful to diagnose the syndrome. Table 4 summarizes the additional tests that may be used:

While certain procedures require specialized equipment, other tests may require only basic supplies. Corneal topography (keratography) may be included as a diagnostic test in the evaluation of the syndrome. Optical coherence tomography (OCT) can be used to assess tear volume. Interferometry and meibography methods are used to evaluate the external lipid component of the tear film and the physiological state of the meibomian glands in the eyelids. closely helps in research and implementation.

GEORGE W. et al.[10] in his monograph entitled "Methodologies for the Study of Ocular Surface Diseases" found that "Dry Eye" syndrome is related to allergic diseases. The treatment process of allergic eye diseases and "Dry eye" syndrome is adversely affected by the patient's lifestyle, environmental pollution and allergic conditions. An allergen challenge model of allergic conjunctivitis allows for physiologically accurate and reproducible identification of signs and symptoms of the disease. In this monograph, allergic response, standardized and quantitative scoring systems allow the creation of a baseline from which statistically and clinically significant differences between formulations can be evaluated.

The effects of allergenic solutions on the eye were first studied in the 1870s by Blackley by testing certain pollens[11]. According to Noon L, in the first half of the 20th century, when skin tests were negative, changes in human eyes were investigated as a non-quantitative method of testing sensitization [12,13]. Abram LE. performed allergen testing by instilling pollen grains into the conjunctival sac and noted that eyes often react positively when skin tests are negative[14]. Tuft and colleagues performed more than 7000 tests in the 1960s with dust allergens such as dust, feathers, and animal dander[15]. In 1975, Stegman and Miller found increased tear protein levels in patients exposed to timothy pollen[16]. In the 1980s, Mikuni showed that pretreatment with cromolyn, using Japanese cedar pollen, could reduce the signs and symptoms of ocular allergy. [17].

This monograph also presents models of allergic conjunctivitis, one of which is designed to assess the effects of adverse environmental factors on contact lenses or solutions even in normal populations, including contact lens wearers. In the case of dry eye syndrome due to allergic conjunctivitis in the relevant population, drying of the ocular surface and environmental factors lead to clinical pathology. It offers the researcher a number of analytical methods implemented in practice that can significantly evaluate the effect of different treatment methods.

List of used literature:

1. Mark S. Milner, MD, Kenneth A. Beckman, MD, and Jodi I. Luchs, MDDysfunctional Tear Syndrome: Dry Eye Disease and Associated Tear Film Disorders - New Strategies for Diagnosis and Treatment//January 16, 2017
2. Nichols KK, Foulks GN, Bron AJ, et al. The International Workshop on Meibomian Gland Dysfunction. Invest Ophthalmol Vis Sci 2011; 52:1917–2085.
3. American Academy of Ophthalmology Cornea/External Disease Panel. Preferred practice pattern guidelines. Dry eye syndrome. San Francisco, CA:American Academy of Ophthalmology; 2013.
4. American Academy of Ophthalmology Cornea/External Disease Panel. Preferred practice pattern guidelines. Blepharitis. San Francisco, CA: AmericanAcademy of Ophthalmology; 2013.
5. Monte´s-Mico´ R. Role of the tear Film in the optical quality of the human eye. J Cataract Refract Surg 2007; 33:1631–1635.
6. Bron AJ, Tomlinson A, Foulkes GN, et al. Rethinking dry eye disease: a perspective on clinical implications. Ocul Surf 2014; 12:S1–S31.
7. Savini G, Prabhawasat P, Kojima T, et al. The challenge of dry eye diagnosis.Clin Ophthalmol 2008; 2:31–55.
8. Honda M, Miyai T, Nejima R, et al. Effect of latanoprost on the expression of matrix metalloproteinases and tissue inhibitor of metalloproteinase 1 on theocular surface. Arch

Ophthalmol 2010; 128:466–471.

9. InflammaDry [package insert]. Sarasota, FL: Rapid Pathogen Screening, Inc;2014.
10. GEORGE W. OUSLER, BS, PAULO J. GOMES, MS, DONNA WELCH, RNBSN, AND MARK B. ABELSON, MD, CM, FRCS(C)// Methodologies for the Study of Ocular Surface Disease// JULY 2005, VOL. 3, NO. 3
11. Blackley CH. Experimental researchers on the cause and nature of catarrhus acativas, Chapter in Hay Fever or Hay Asthma. London, Bailliere, Tindal, Cox, Ltd, 1873
12. Noon L. Prophylactic inoculation against hay fever. Lancet 1911;1:1572
13. Peshkin MM. A dry pollen ophthalmic test in pollen asthma and hayfever patients negative to cutaneous tests. J Allergy 1931;3:20
14. Abram LE. An evaluation of conjunctival testing in extrinsic respiratory allergy. J Allergy 1949;20:66-9
15. Tuft L. The value of eye tests with inhalant allergens- a clinical study. Ann Allergy 1967;25:183-91
16. Stegman R, Miller D. A human model of allergic conjunctivitis. Arch Ophthalmol 1975;93:1354-8
17. Mikuni I. The use of provocation tests for the diagnosis of allergic conjunctivitis caused by Japanese cedar pollen. Tokai J Exp Clin Med 1980;5:375-84