

Our Observations on the Correlation Between Dry Eye Syndrome and Atrophic Rhinitis

F. M. Khamidova, A. V. Vasilenko
Department of Ophthalmology, SamSMU

Annotation: This article describes the observations of dry eye syndrome (DES) manifestations in patients with atrophic (dry) nasopharyngitis. The purpose of the study was to establish a correlation between dry eye syndrome (DES) and atrophic nasopharyngitis. Standard ophthalmological methods were used for the study, including Norn's test, Schirmer's test, and meniscometry. The results showed that approximately half of the patients with atrophic rhinitis also exhibited dry eye symptoms. The conclusion suggests a partial correlation between DES and atrophic nasopharyngitis.

Keywords: dry eye syndrome, Schirmer's test, Norn's test, atrophic nasopharyngitis.

Relevance. Dry eye syndrome (DES) is a multifactorial disease of the eye surface characterized by a disruption of tear film homeostasis and the appearance of ocular symptoms. The main factors contributing to the development of DES include tear film instability, hyperosmolarity, chronic inflammation, damage to the ocular surface, and neurosensory deficiency. The eye surface (cornea, conjunctiva, accessory lacrimal glands), Meibomian glands (special sebaceous glands on the eyelid margins that produce the outer lipid layer of the tear film), the main lacrimal gland, and nerve fibers that innervate these structures form a functional unit. In DES, the pathological process can affect any or all these structures simultaneously.

The prevalence of DES is highly variable, ranging from 5% to 50% of the global population based on symptoms and objective signs. If the diagnosis is based solely on symptoms, the incidence rises to 75%. Depending on the population, race, and age, the incidence ranges from 35% to 68.3%. According to Russian researchers, the incidence of DES in recent years has reached over 45% and increases with age. Among people younger than 50, the incidence of DES is up to 12%, between 50 and 75 years – up to 67%, and in those older than 75 years – up to 80%. Our region is a favorable place for observing this category of patients due to its climatic characteristics: hot and dry summers, high dust levels in the air, low annual rainfall, and sharp temperature fluctuations. The impact of these factors on human mucous membranes that encounter the external environment leads to various pathologies of the upper respiratory tract, especially of the eye.

Research Objectives. To study the symptoms of dry eye syndrome in patients with atrophic nasopharyngitis.

Materials and Methods. A total of 33 patients (66 eyes) were observed, divided into two groups: the main group and the control group. The main group consisted of 17 patients (34 eyes) with a confirmed diagnosis of atrophic rhinitis, while the control group included 16 patients (32 eyes) with symptoms of dry eye syndrome. Conventional ophthalmological methods were used for the study, including Norn's test, Schirmer's test, meniscometry, as well as the subjective ESDI questionnaire.

Table 1

Group	Tear Film Break-Up Time (Norn's Test)	Schirmer's Test Results	Conjunctival Hyperemia and Discomfort (Foreign Body Sensation under the Upper Eyelid)	Meniscometry (Ratio of Tear Meniscus Height, Width, and Curvature Radius)
Main Group (Atrophic)	3-4 sec (14 eyes, 41.2%)	6-7 mm (19 eyes,	(+++) 14 eyes (41.2%) (++) 10 eyes (29.4%) (+) 6 eyes	0.7/1.0 (20 eyes, 58.8%) 1/1.2 (14

Rhinitis, 17 patients, 34 eyes)	6-7 sec (20 eyes, 58.8%)	55.9%) 10-12 mm (15 eyes, 44.1%)	(17.6%)	eyes, 41.2%)
Control Group (Dry Eye Syndrome without Rhinitis, 16 patients, 32 eyes)	8 sec (8 eyes, 25%) 10 sec (24 eyes, 75%)	15 mm and above (24 eyes, 75%) 10-12 mm (8 eyes, 25%)	(+++) 15 eyes (46.9%) (++) 9 eyes (28.1%) (+) or absent in 8 eyes (25%)	1/14 (22 eyes, 68.8%) 1/17 (10 eyes, 31.2%)

Results and Discussion

In the main group (17 patients, 34 eyes) with a confirmed diagnosis of atrophic rhinitis, Norn's test showed tear film break-up time of 3-4 seconds in 14 eyes and 6-7 seconds in the remaining 20 eyes (58.8%). Schirmer's test results indicated 6-7 mm of wetting in 19 eyes (55.9%) and 10-12 mm in 15 eyes (44.1%). Conjunctival hyperemia and discomfort were rated as (+++) in 14 eyes (41.2%), (++) in 10 eyes (29.4%), and (+) in 6 eyes (17.6%). Meniscometry showed a ratio of tear meniscus height to width of 0.7/1.0 in 58.8% of eyes and 1/1.2 in 41.2%.

In the control group (16 patients, 32 eyes), the tear film break-up time was 8 seconds in 8 eyes (25%) and 10 seconds in 24 eyes (75%). Schirmer's test results showed wetting of 15 mm or more in 75% of eyes and 10-12 mm in 25%. Conjunctival hyperemia and discomfort were rated as (+++) in 46.9% of eyes, (++) in 28.1%, and absent in 25%. Meniscometry showed a ratio of 1/14 in 68.8% of eyes and 1/17 in 31.2%.

The results of the ESDI questionnaire were as follows: In the main group, 6 patients scored between 417-625 points (corresponding to severe DES), 8 patients scored 156-250 points (moderate DES), and 3 patients scored 114-139 points (mild DES). In the control group, 4 patients scored 417-625 points (severe DES), 7 patients scored 156-250 points (moderate DES), and 5 patients scored 114-139 points (mild DES).

Summary

Thus, in 41.2%-55.8% of patients with a preliminary diagnosis of atrophic rhinitis, various manifestations of DES were identified. These included shortened tear film break-up time (41.2%), reduced hydration in Schirmer's test (55.9%), clinically significant conjunctival hyperemia, and discomfort under the upper eyelid (41.2%). Meniscometry revealed altered ratios of tear meniscus height, width, and curvature in 58.8% of cases. In the control group (patients with DES without rhinitis), these indicators were somewhat different. Norn's test was positive in 25% of cases, and reduced hydration was observed in 25% of patients in Schirmer's test. Symptoms of dry conjunctivitis were noted in 46.9% of cases.

Correlation between the tear film break-up time and Norn's test results was studied in both the main and control groups, with a significant difference of $p=0.05$.

Conclusions

1. The severity of DES manifestations with and without rhinitis varies across different indicators. Tear film break-up time was significantly shorter in the main group compared to the control. Similarly, Schirmer's test showed significantly less hydration in the main group compared to the control group.
2. In terms of clinical manifestations, the difference between the main and control groups was less pronounced ($p \geq 0.1$). Considering that the formation and maintenance of the tear film is a complex neurohumoral and neuro-reflex process, further observation and systematization are required.

References

1. Brzjeskii, V.V., Somov, E.E. (2003). Cornea-conjunctivitis xerosis (diagnostic clinic treatment). SPb.: Levsha, pp. 119-134.
2. A.A. Yusupov, F.M. Khamidova, A.V. Vasilenko. Reviewing some clinical manifestation features of dry eye syndrome in glaucoma patients undergoing a continuous hypotensive regimen. *Science and Innovation, International Scientific Journal*, Vol. 3, Issue 1, January 2024, pp. 5-9.
3. A.V. Vasilenko, F.M. Khamidova. Dynamics of the state of the ciliary body of patients with refractory glaucoma according to the data of ultrasonic biomicroscopy. <https://doi.org/10.5281/zenodo.7729696>. *Science and Innovation, International Scientific Journal*
4. A.V. Vasilenko, F.M. Khamidova. Dynamics of the state of the ciliary body of patients with refractory glaucoma according to the data of ultrasonic biomicroscopy
5. SCIENCE AND INNOVATION INTERNATIONAL SCIENTIFIC JOURNAL VOLUME 2 ISSUE 3 MARCH 2023 UIF-2022: 8.2 | ISSN: 2181-3337 | SCIENTISTS.UZ <https://doi.org/10.5281/zenodo.7729696>
6. Юсупов А.А., Хамидова Ф.М. Современный клинико-диагностический подход к проблеме сухого глаза *Проблемы биологии и медицины* 2022, №6 (140) стр 434-442., <https://doi.org/10.38096/2181-5674.2022.6>
7. Yusupov A.A., Khamidova F.M. Modern clinical and diagnostic approach to the problem of dry eye (literature review) // *Problems of biology and medicine*, Samarkand, 2022, 434-440 pp.
8. Yusupov A.A., Vasilenko A.V., Khamidova F.M. Dynamics of some clinical parameters of patients with normotensive glaucoma under the influence of complex drug therapy. // *Problems of biology and medicine*. -No. 3(136). -2022. -P.130-135.
9. Andrey _ Vasilenko, Amin Yusupov, Firuza Khamidova, Malika Yusupova (2020). Optical Coherence Tomography of The Optic Nerve Disk in The Monitoring System of The Effectiveness of Drug Therapy for Normotensive Glaucoma. *International Journal of Pharmaceutical Research*, Jul -Dec 2020, Vol 12. // *Supplementary Issue*. - R.1904-1906.