

The Etiology, Pathogenesis and Traditional Chinese Medicine Treatment of Dry Eye

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Abstract: This article aims to discuss the historical evolution of dry eye, explore the etiology and pathogenesis, and summarize the traditional Chinese medicine treatment of dry eye. The causes of dry eye are no more than two aspects: external infection and internal injury. External pathogenic factors include wind, dryness, dampness, heat and fire pathogenic factors. Internal injuries and illnesses are caused by three aspects: improper diet, overwork or excessive comfort, and emotional imbalance. The pathogenesis of dry eye is based on insufficiency of Yin essence. The normal production and distribution of tears are closely related to the normal physiological state of the five internal organs. The traditional Chinese medicine treatments for dry eye include internal administration of Chinese herbal medicine, Chinese herbal fumigation therapy, Chinese herbal nebulization therapy, and acupuncture therapy.

Keywords: Dry eye, Etiology and pathogenesis of dry eye, Traditional Chinese Medicine treatment for dry eye.

1. Introduction

The disease name “dry eye” did not exist in ancient Chinese medical books. During the Sui and Tang Dynasties, the “Treatise on the Etiology and Symptoms of Various Diseases” mentioned in the section on the symptoms of dry eyes that “when the body fluids are exhausted, the eyes will be dry”, recognizing the impact of insufficient body fluids on the onset of dry eyes. During this period, dry eyes fall under the category of “astringent eyes”. During the Ming Dynasty, the term “white astringency syndrome” was first proposed in the “Review of Yao Letters”. In this book, dry eye syndrome was described as “neither swollen nor red, not refreshing, sandy and hazy, called white astringency”, clearly indicating the origin and clinical manifestations of the disease name “dry eye” [1]. The disease name “dryness and drowsiness” was first proposed in “Guidelines for Diagnosis and Treatment”, and its main symptoms were described as “the eyes feel dry and uncomfortable, and the vision is drowsiness.” Wang Kentang recognized that the deficiency of Yin fluid was the main cause of white astringency syndrome. Therefore, in his Guidelines for Diagnosis and Treatment”, he named dry eye “Shenshui will wither away due to illness” based on its cause. By the Qing Dynasty, the “The Great Accomplishment of the Mu Jing” inherited the previous understanding of dryness and drowsiness, and on the basis of the theory that the divine water was about to wither, it proposed the disease term “exhaustion of the divine spirit” [2].

2. Etiology and Pathogenesis of Dry Eye

2.1 The Causes of Dry Eye

External pathogenic factors include wind, dryness, dampness, heat and fire pathogenic factors. Wind is good at changing its behavior and has the characteristics of ascending, moving upward and outward. Therefore, it is more likely to reach the Yang position and invade the eye system, causing dryness in the eyes. Dryness and astringency of pathogenic factors can easily damage body fluids and cause dry eyes. Dampness is a Yin pathogen. When it is heavy in nature, it easily hinders the generation of Yang qi and blocks the normal operation of qi.

Without the promoting and spreading effect of Yang qi, body fluids cannot reach the eye system, resulting in symptoms of dry eyes. Wind-heat retention in the lungs or latent heat in the spleen, ascending to the eyes, heat burning and damaging the body fluids, unable to seep up to the eyes, resulting in dry eyes. Fire evil burns upward and is prone to invade the upper part of the human body, consuming qi and depleting body fluids. The eyes are in the Yang position and are easily invaded by fire evil, burning the body fluids of the eyes [3].

Internal injuries and illnesses are caused by three aspects: improper diet, overwork or excessive comfort, and emotional imbalance. When food and grains are absorbed into the stomach, the spleen and stomach’s decomposition and transformation functions transform them into their essence and distribute it throughout the body. If one has a preference for thick and spicy foods, it can lead to internal accumulation of damp-heat in the spleen and stomach, hindering the upward flow of clear qi and preventing the transportation of body fluids to the eye system, thus resulting in dry eyes. The moisture of the eyes depends on the normal distribution and circulation of body fluids. Overwork or excessive rest can cause the essence, qi, blood and body fluids to lose their normal circulation state, thus making it easy for the eyes to become dry. Emotional imbalance can affect the normal physiological functions of internal organs. For instance, extreme anger can harm the liver, causing liver qi to invade the eyes and lead to dry eyes. If one is depressed, it can result in liver qi stagnation, poor qi circulation, and obstruction of the distribution of body fluids, which can also cause dry eyes

2.2 The Pathogenesis of Dry Eye

The liver is the general organ. If the liver blood is insufficient and the liver Yin is deficient, it is unable to nourish the eye system, thus causing symptoms such as dry eyes and blurred vision. The spleen is the foundation of the body after birth. When the spleen is weak, the qi is weak. The qi cannot be transported upward to the heart and lungs, and the production of qi and blood is insufficient. Therefore, the qi and blood distributed to various organs are not enough to maintain normal operation, which leads to symptoms such as dry eyes

and easy fatigue. The lung is the master of qi, governing all the qi in the body. It transports qi and blood upward to the eye system, thus making the eyes moist and moist. In the five rounds of syndrome differentiation, the white eyes belong to the lung system. Due to external invasion or internal injury, there is insufficient lung Yin, which cannot nourish the eyeballs upwards, thus resulting in dry eyes. The kidney is the foundation of the body's innate constitution and governs water. The normal metabolism of body fluids cannot do without the qi transformation function of kidney Yang. If kidney qi is insufficient, body fluids will be unable to reach the eyeballs, thus resulting in dry and dull eyes. The heart governs the blood vessels, transforming red into blood. Body fluids and blood have the same origin. If the heart blood is abundant, the heart blood in the blood vessels can differentiate part of the body fluids outside the blood vessels, reaching the eyeballs and nourishing the eye system.

3. Traditional Chinese Medicine Treatment for Dry Eye

3.1 Oral Administration of Traditional Chinese Medicine

Professor Peng Qinghua [4] believes that dry eye mainly has four syndrome types: insufficiency of lung Yin, liver meridian stagnation heat, deficiency of both qi and Yin, and lingering pathogenic heat. He attaches great importance to the patient's Yang qi state and emphasizes prevention before the disease occurs. In clinical practice, he often uses Bupleurum, Lycium barbarum, and honeysuckle. Professor Xie Liko [5] believes that the onset of dry eye is closely related to "depression" and "deficiency", and he proposed the pathogenesis of "liver depression and Yin deficiency", and developed the Xiaosheng Powder formula for treatment. In clinical practice, Professor Xie Liko attaches great importance to using wind medicine to dispel wind and relieve the exterior, disperse pathogenic factors and unblock meridians, and relieve depression. He often uses siler, chrysanthemum and mulberry leaves.

3.2 Chinese Herbal Fumigation Therapy

Chinese herbal fumigation therapy is a commonly used external treatment method in clinical practice. Through a Chinese herbal fumigation machine, the Chinese herbal liquid is heated to the corresponding temperature, and then the eyes and the skin around the eyes are fumigated while still hot. The warm herbal liquid promotes the blood circulation in the blood vessels of the eyes, increases the moisture on the surface of the eyeballs, and makes the Chinese herbal liquid work more effectively in the eyes. Ma ANI [6] collected 70 nucleic acid collectors with dry eye syndrome. The experimental group (35 cases) was treated with traditional Chinese medicine fumigation, and the control group (35 cases) was treated with compound chondroitin sulfate eye drops. After 4 weeks of treatment, the total effective rate of the traditional Chinese medicine fumigation group (94.28%) was significantly higher than that of the control group (74.27%).

3.3 Traditional Chinese Medicine Atomization Therapy

Ultrasonic atomization of traditional Chinese medicine mainly acts on the surface of the drug. By breaking the tension and inertia of the drug surface, it separates the drug into

smaller molecular particles, which can be more evenly distributed on the patient's ocular surface, more effectively absorbed by the conjunctiva and cornea, relieve corneal dryness, and promote tear secretion. Wu Ziwen [7] et al. treated 120 cases of dry eye (liver and kidney Yin deficiency type) with Erxian Decoction nebulization combined with artificial tears, which could effectively reduce the ocular clinical symptom score, with an effective rate of 90.0%.

3.4 Acupuncture Treatment

Acupuncture treatment for dry eye usually employs local and distal acupoint selection methods. By regulating the qi of the meridians, the circulation of qi leads to the smooth flow of blood, maintaining the unobstructed flow of qi and blood in the meridians, thereby making the eyeballs moist and bright. Professor Zuo Tao [8,9] believes that dry eye is closely related to the liver, kidneys, spleen and lungs. The clinical syndrome types are often characterized by liver and kidney Yin deficiency, spleen qi insufficiency and Yin deficiency with lung dryness. The principle of clinical treatment is to warm, unblock and nourish. At the same time, it attaches great importance to the theory of Xuanfu, believing that the onset of dry eye is closely related to "liver qi stagnation and Xuanfu blockage". Professor Zuo Tao divided the eyes into eight zones and thirteen acupoints through the "Peng's Eye Acupuncture", with more acupoints selected around the eyes, fully exerting the therapeutic effect of nearby treatment.

4. Conclusion

Dry eye falls within the categories of "white astringency syndrome" and "divine water Depletion Syndrome" in traditional Chinese medicine. This disease is closely related to the liver, spleen, lungs and kidneys. The causes of its onset include deficiency of liver and kidney Yin, insufficiency of liver Yin fluid, and spleen deficiency and poor transportation. The lung's failure to disperse and descend, dryness injuring lung Yin and preventing it from nourishing the eyes, and the obstruction of meridians where Yang qi and Yin fluid are distributed are important inducing factors for its onset. The main pathogenesis is especially characterized by deficiency of body fluids, burning due to internal heat, and loss of moist body fluids in the eyes. At present, certain progress has been made in the related research of dry eye. However, due to the excessive risk factors of dry eye, the long course of the disease and the easy recurrence after treatment, it is difficult to recover from dry eye. Traditional Chinese medicine has remarkable effects in treating dry eye, with advantages such as simple operation, low cost and few side effects.

References

- [1] Tang Mingming. Observation on the Therapeutic Effect of Traditional Chinese Medicine Eye Fumigation Combined with Meibomian Gland Massage in the Treatment of Dry Eye with Insufficiency of Lung Yin Syndrome [D]. Hunan University of Chinese Medicine, 2021.
- [2] Li Yu. Clinical Observation on the Treatment of Lipid-Abnormal Dry Eye with Traditional Chinese Medicine Nebulization Therapy Combined with

- Pranoprofen Eye Drops [D]. Heilongjiang University of Chinese Medicine, 2023.
- [3] Li Yi. Observation on the Therapeutic Effect of Liver and Kidney Tonifying Formula Combined with Traditional Chinese Medicine Fumigation in the Treatment of Dry Eye with Liver and Kidney Yin Deficiency [D]. Guangzhou University of Chinese Medicine, 2023.
- [4] Ou Chen, Yang Yijing, Zhou Yasha, et al. Peng Qinghua's Experience in Diagnosing and treating Dry Eye [J]. Chinese Journal of Traditional Chinese Medicine, 2019, 34(11):5207-5209.
- [5] Wu Gaiping, Hao Xiaofeng, Luo Jinhua, et al. Clinical Experience of Xie Liko's Method of Soothing the Liver and Nourishing Yin in the Treatment of Dry Eye [J]. Liaoning Journal of Traditional Chinese Medicine, 2022, 49(2):12-14.
- [6] Ma ANI, Li Na, Hao Yuying, et al. Clinical Research on the Treatment of Dry Eye Syndrome in Nucleic Acid Collection Personnel with Traditional Chinese Medicine Fumigation Formula [J]. Journal of Shaanxi University of Chinese Medicine, 2022, 45(05):148-151.
- [7] Wu Ziwen, Zhang Mu, Li Shuyan, et al. Observation on the Therapeutic Effect of Erxian Decoction Nebulization Combined with Artificial Tears in the Treatment of Dry Eye Syndrome of Liver and Kidney Yin Deficiency Type [J] Chinese Journal of Traditional Chinese Medicine, 2022, 37(06):3620-3623.
- [8] Chi Kaiyao, Zhao Lei, Cheng Xiangfu, et al. Professor Zuo Tao's Experience in treating Dry Eye not Caused by Aging with "Regulating the Liver and Unlocking the Mysteries" [J]. Western Chinese Medicine, 2022, 35(12): 84-87.
- [9] Cheng Xiangfu Research on the Regularity of Treating Dry Eye with External Therapies of Traditional Chinese Medicine Based on Data Mining and Summary of Mentors' Experience [D] Liaoning University of Traditional Chinese Medicine, 2021.