

Prevention and control of myopia based on meridians and zang-fu organs theory for unblocking meridians and harmonizing zang-fu organs

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Abstract. The prevention and control of myopia has always been a global challenge, as high myopia can lead to visual field defects, distorted vision, blindness, and other serious risks. Traditional Chinese Medicine (TCM) believes that myopia is the external manifestation of the overall physical condition in the eyes, which is related to the function of the eyes and the overall body functions. Based on the meridians and zang-fu organs theory, this article explores the associations of meridians and the zang-fu organs with the eyes, as well as their influence on myopia. “Obstruction of meridians” and “disharmony of the zang-fu organs” were found to be the fundamental pathological mechanisms that lead to the inability of the eyes to see distant objects. As one of the myopia prevention and control techniques, tuina shows significant therapeutic efficacy and green safety. On the one hand, it helps transport essence and brighten the eyes by unblocking the meridians around the eyes, neck, shoulder, and back to promote the flow of qi and blood. On the other hand, it can generate essence and brighten the eyes by harmonizing cold, heat, deficiency, and excess in the zang-fu organs to tonify qi and blood. Under a combination of localized and holistic action, this ultimately promotes the generation of essence and qi, unobstructed the flow of the visual pathway, and restoration of visual function, effectively preventing the occurrence and progression of myopia.

Keywords: myopia; the meridians and zang-fu organs theory; unblocking the meridians; harmonizing the zang-fu organs

1. Introduction

Myopia is a form of refractive error where the image of an object focuses in front of the macular fovea of the retina. Apart from clinical manifestations like blurry vision, eye discomfort, bulging, and exotropia, high myopia elevates the risk of ocular fundus diseases such as posterior staphyloma, macular lesions, retinal detachment, choroidal neovascularization, and glaucoma [1]. In 2020, myopia prevalence among Chinese children aged 6 was 14.3%, 35.6% for primary school students, 71.1% for middle school students, and 80.5% for high school students, illustrating a rapid rise with age. Approximately 10% of myopic patients are highly myopic [2]. Therefore, reducing myopia incidence in children and adolescents and controlling the occurrence and progression of high myopia are crucial tasks in myopia control in China.

“In Myopia” belongs to the category of “near-weakness, distant-sharp” in traditional Chinese medical literature. Ancient physicians attributed the etiology of myopia mainly to congenital deficiencies, unreasonable eye habits, and visual environments. The pathogenesis of myopia is related to local ocular circulatory and nutritional deficiencies, involving the entire body’s visceral meridians. “The essence of the five viscera and six bowels ascends to the head to form the functions of the seven apertures,” as mentioned in “Categorized Classic of Medical Disorders.” Qi Bo said, “The twelve main meridians and three hundred sixty-five collaterals carry blood and Qi to ascend to the face and circulate through the hollow apertures.” These statements emphasize that the abundance of visceral Qi and smooth circulation of Qi and blood in meridians are necessary conditions for normal distant vision. This paper explores the pathogenesis and treatment of myopia based on the Meridians and Zang-fu organs theory, aiming to provide insights into myopia control.

2. Elaboration on the Meridians and Zang-Fu Organs Theory

The concept of zang-fu organs theory is based on the teachings of the “Plain Questions” (《素问》) and “Spiritual Pivot.” (《灵枢》) Initially, they referred to relatively independent anatomical organs in the body’s structure. For instance, the “Spiritual Pivot - The Root of Organs” (《灵枢·本脏篇》) records: “The five zang organs have their respective sizes, positions, strengths, weaknesses, normal or abnormal inclinations, and the six fu organs also vary in size, length, thickness, straightness, and looseness.” (五脏者，固有小大、高下、坚脆、端正、偏倾者，六腑亦有小大、长短、厚薄、结直、缓急) For example, “if the liver is enlarged, it presses the stomach, causing discomfort in the stomach and pain below the ribs.” (肝大则逼胃迫咽，迫咽则苦膈中，且胁下痛) As traditional Chinese medicine’s understanding of the body deepened, the meaning of zang-fu organs evolved from anatomical organs to overall functions. The “Inner Canon” (《内经》) mentions theories like “the heart governs blood vessels (心主血脉),” “the liver stores blood (肝藏血),” “the lungs govern qi (肺主气),” “the kidneys govern water (肾主水),” and “the spleen governs transformation (脾主运化),” which were summarized based on anatomical physiology and clinical practices. Innovations in subsequent generations continuously enriched and improved the zang-fu organs theory, integrating it with philosophical concepts like yin-yang, five elements, and essence, Qi, blood, and body fluids, forming a comprehensive system. Traditional Chinese medicine believes that the harmony of zang-fu organs is essential for health, as stated in “Tai Ping Holy Prescriptions” (《太平圣惠方》): “When the zang-fu organs are harmonious, the body’s defense is balanced inside and out, preventing intrusion of pathogens (脏腑和平，荣卫调适，表里充实，则邪不能侵也).” Emphasis is placed on the body’s health depending on the balance of yin-yang and the five elements within the zang-fu organs.

The basic framework of the meridian theory is built upon the “Inner Canon (《黄帝内经》).” “Plain Questions - Regulation of Channels (《素问·调经论》)” states: “The pathways of the five zang organs are all through meridian tunnels, allowing the circulation of blood and Qi. If blood and Qi are not harmonized, various diseases may arise (五脏之道皆出于经隧，以行其血气，血气不和，百病乃变化而成).” The meridian tunnels represent the meridians, emphasizing their importance as pathways for the circulation of blood and Qi among the five zang organs. “Spiritual Pivot - Sea Discussions” (《灵

枢·海论》) mentions, “The twelve meridians are internally connected to the viscera and externally connected to the limbs and joints (夫十二经脉者,内属于腑脏,外络于肢节).” This indicates that the twelve meridians play a role in connecting the viscera and the surface of the body and limbs. “Spiritual Pivot - Meridians” provides detailed descriptions of the connections between the twelve meridians and the zang-fu organs, as well as pathological changes. Therefore, it is understood that meridians serve as pathways for the circulation of Qi and blood, linking the internal organs, body surface, and the upper and lower extremities. For the meridians to function properly, unobstructed pathways and harmonious zang-fu organs are necessary conditions. Obstructed meridians and disharmonious zang-fu organs constitute the basic pathogenesis of meridian-organ diseases.

In conclusion, tracing the origins of the meridians and zang-fu organs theory reveals that unobstructed meridians and harmonious zang-fu organs are essential for their functioning. Obstructed meridians and disharmony in zang-fu organs constitute the fundamental pathogenesis of meridian-organ diseases.

3. Preventing and Controlling Myopia Based on the Meridians and Zang-Fu Organs Theory in Traditional Chinese Medicine

3.1. The Meridians and Zang-Fu Organs Theory and the Eyes

From the perspective of meridian distribution, the Bladder Meridian of Foot-Taiyang starts from the Jingming acupoint in the inner corner of the eye; the Stomach Meridian of Foot-Yangming ascends to the medial canthus; the Gallbladder Meridian of Foot-Shaoyang originates from the outer corner of the eye at the Tongziliao acupoint; the Small Intestine Meridian of Hand-Taiyang starts from the Quepen along the neck to the cheek at the Quanliao acupoint, then moves up to the outer corner of the eye, branching to reach the inner corner of the eye; the Triple Burner Meridian of Hand-Shaoyang extends from the ear to the outer corner of the eye. Additionally, the Heart Meridian, Liver Meridian, and ocular systems are interconnected. Therefore, the eye is closely related to the functionality of meridians and visceral organs.

Traditional Chinese Medicine’s “Wulun Theory (五轮学说)” suggests a connection between eye tissues and the five zang organs and six fu organs. “The Spiritual Pivot - The Great Confusion (《灵枢·大惑论》)” states: “The essence of the five zang organs and six fu organs ascends to the eyes. The essence forms the eyes; the essence of bones forms the pupil; the essence of tendons forms the iris; the essence of blood forms the vessels. The essence of the cavity forms the sclera; the essence of muscles forms the eye’s constraints (五脏六腑之精气上注于目, 精之窠为眼,骨之精为瞳子,筋之精为黑眼,血之精为络,其窠气之精为白眼,肌肉之精为约束).” Based on the anomalous forms in different parts of the eyes, there remains clinical application value in diagnosing corresponding visceral organ pathologies.

3.2. The Meridians and Zang-Fu Organs Theory and Myopia

3.2.1. Obstructed Meridians Inducing Myopia. In the “Classical Meridians (《类经》),” there is a commentary on the lateral branches of the sinews related to the Foot Shaoyang meridian reaching the outer canthus of the eye. It states, “The ability to look left and right relies on the extension and contraction of these sinews (凡人能左右盼视者, 正以此筋为之伸缩也),” explaining that the sinews around the eyes govern the opening and closing of the eyelids as well as the rotation of the eyeballs. Prolonged strain and intense focus cause the eye sinews to remain in a tense and spasmodic state, hindering the smooth circulation of Qi and blood in the eyes and leading to insufficient nourishment. This tension also diminishes the regulatory function of the ocular muscles, ultimately resulting in farsightedness, triggering pseudo-myopia and axial myopia.

In the “Ling Shu: Cold-Heat Disorders (《灵枢·寒热病》),” it states, “The Foot Taiyang meridian connects to the head and belongs to the eyes, called the ocular system (足太阳有通项入于脑者, 正属

目本，名曰眼系)。” This indicates that the bladder meridian in the back is the origin of the ocular system, and the neck region serves as the main pathway for the ocular system. If the meridians around the eyes, head, face, and neck-back are obstructed, causing poor blood circulation, even with abundant essence and Qi in the internal organs, the eyeballs will still lack sufficient nourishment, and their radiance will fail to extend into the distance. When the meridians are unobstructed, the essence and Qi of the internal organs can flow upward and nourish the eyes.

3.2.2. Disharmony Among Organs and Their Role in Myopia. The eyes are the outpost of the Liver. “The Spiritual Pivot - Pulse Examination (《灵枢·脉度》)” states: “The five zang organs constantly oversee the upper seven apertures... Liver Qi connects to the eyes; when the Liver is harmonious, the eyes can distinguish five colors (五脏常内阅于上七窍也.....肝气通于目，肝和则目能辨五色矣).” The Liver is Yin but utilizes Yang, with blood as its substance and Qi as its function. “The Plain Questions - On the Generation of the Five Zang Organs (《素问·五脏生成篇》)” mentions: “The Liver receives blood and can see (肝受血而能视).” “Observations on Eye Diseases (《审视瑶函》)” says: “The blood in the eyes is the source of nourishment; when abundant, it generates growth and nourishment without eye disease (夫目之有血，为养目之源，充和则有发生长养之功，而目不病).” These references indicate that the fullness of Liver blood is the material foundation for the eyes to perform visual functions, distinguishing between black and white, judging lengths, and enabling clear spiritual vision. Whether the blood stored in the Liver can nourish the eyes requires the synergistic coordination of the Liver’s function of regulating circulation. If Liver Qi is depressed, Liver blood cannot circulate within the eye’s apertures, impeding the nourishment of genuine blood in the meridians. As stated in “Treatise on Various Diseases - Symptoms of Eye Diseases (《诸病源候论·目病诸候》),” “The Liver stores blood; when the Qi and blood of the zang-fu organs are harmonized, the eyes shine brightly (肝藏血，若脏腑气血调和，则目精彩明净).” Moreover, Wood depression can affect the Spleen, thus impacting Spleen-Stomach digestion, hindering the distribution of refined substances to the eyes. From this, it’s evident that myopia is closely associated with Liver blood deficiency, Liver Qi stagnation, hindered Liver meridians, and the Liver Qi affecting the Spleen.

The Spleen-Stomach is the foundation of acquired essence and the source of Qi and blood transformation. “The Elucidation on Ophthalmology (《眼科阐微》)” points out: “Essence and blood must rely on the Stomach Qi for generation. The Stomach is the source of the five zang organs and six fu organs, the foundation of development and deployment of the divine mechanism (夫精血必借胃气生，胃乃五脏六腑之源，开发神机之本).” If the Spleen’s Earth is damp and stagnant, preventing clear Yang ascension, it can lead to the lack of distribution of refined substances, resulting in the eyes being undernourished. If Stomach Qi fails to descend and the intestines are obstructed, it might cause turbid Qi to stagnate, leading to unclear vision. Additionally, Spleen deficiency makes water easily stagnate, affecting the eye’s regulatory capacity, inducing eyelid edema, which can cause pseudo-myopia.

The Heart represents fire, the Kidneys represent water; when the Heart and Kidneys are balanced, balancing water and fire, and when Yin and Yang are harmonious, vision is used optimally for both near and far. If the balance between water and fire is disrupted, brilliance will be hidden. “Medical Records of Wang Jiufeng - Eye Diseases (《王九峰医案下卷·目疾》)” mentions: “Dry eyes... eye pain, blurry vision, strengthen water to quell sunlight (目干.....目珠作痛，视物模糊，壮水以镇阳光).” It implies that when water cannot nourish the eyes and virtual fire flares up, it causes blurry vision. “Observations on Eye Diseases - The Eye as a Precious Object (《审视瑶函·目为至宝论》)” states: “The essence of brilliance originates from the destiny gate, passes through the Gallbladder, emerges from the Heart, all being the use of fire (夫神光原于命门，通于胆，发于心，皆火之用事).” If Yang is deficient, it cannot sufficiently stimulate Qi and blood to warm and nourish the eyes, hindering the manifestation of brilliance. “Collection of Medical Prescriptions (《医方集解》)” uses Dingzhi Pill to treat the inability to see distant objects, stating: “Using ginseng to supplement Heart Qi, Acorus to open Heart orifices, Poria connecting Heart Qi to the Kidneys, and Rhizoma Bletillae clearing the Liver and stabilizing the

Heart; the Heart belongs to fire, when the fire is vigorous, brilliance can reach far (用人参补心气，菖蒲开心窍，茯苓交心气于肾，远志通肾气于心，朱砂清肝镇心，心属离火，火旺则光能及远也).”

In summary, by balancing the Liver Wood, invigorating the Spleen-Stomach, and connecting the Heart-Kidneys, harmonizing the zang-fu organs, it can promote overall harmonization of Qi and blood, abundant essence and Qi, and a balance between Yin and Yang, thus nourishing the eyes and ensuring clear vision for distant objects.

4. Treating Myopia through Clearing Meridians and Harmonizing Zang-Fu Organs

4.1. *Regulating Qi and Blood, Nourishing Essence for Clear Vision*

Massaging acupoints around the eyes helps clear meridians relax spasms, aiding in relieving spasms of the ciliary muscles, thus enhancing eye adjustment functions. Studies by Wang Xinyu and others [3] found that combining the “One Finger Zen “ massage technique (一指禅推法) with specific pediatric manipulative therapy (特定小儿推拿) significantly reduces the degree index of eye muscle spasms and improves visual acuity scores. Massaging around the eyes also enhances blood flow in the anterior ciliary arteries, affecting the sympathetic nervous system of the ciliary muscles [4]. This notably improves regulation function parameters such as AMP (Amplitude of Accommodation), AF (Accommodative Facility), and AC/A ratio (Accommodative Convergence/Accommodation ratio) [5,6], controlling myopia progression [7-10].

Clearing the neck, shoulders, and back helps lift and disperse clear Yang, assisting in delivering essence and Qi from zang-fu organs to the eyes. “The Yellow Emperor’s Inner Classic (《黄帝内经·素问》)” states: “Heaven nourishes the head from above (上配天以养头).” The head symbolizes heaven, and when clear and bright like the weather, it ascends clear Yang, contributing to the beauty of the seven apertures, shining like the seven luminaries. “Observations on Eye Diseases (《素灵微蕴·目病解》)” describes blockages and stagnation in head meridians, resulting in an accumulation of turbid Yin, affecting Qi and blood circulation and causing visual impairment (头上经络，浊阴冲塞，气血凝滞，津液壅滞，翳障层生，阳神蔽锢，而光明损矣). Modern medicine finds that increased blood flow in the choroid can inhibit myopia development [11]. Massage adjusts the imbalanced state of bones and tendons in the neck, shoulders, and back, improving blood flow in the vertebral artery, basilar artery, and choroid. This helps alleviate choroidal hypoxia, slowing down choroidal remodeling, effectively preventing excessive elongation of the eye axis [3,12]. Studies by Zhao Jingru and others [5] found that massaging Fengchi, Fengfu, Tuiqiao Gong, Borou Xiejia muscles, massaging the shoulder blades, and pressing Jianjing improved neck muscle spasms, cleared Qi and blood apertures, and enhanced blood flow in the eye and anterior ciliary arteries. Zhang Jian and others [13] found that the “Three-Step Massage Technique” (eyes, neck, head) increased blood flow rates in the vertebral and basilar arteries. Zhou Ping and others [14] utilized spinal massage (tilting cervical, thoracic, and lumbar vertebrae) combined with local facial massage to treat myopia, significantly altering cerebral blood flow, with a 98.75% effective treatment rate.

4.2. *Strengthening Zang-Fu Organs for Vital Essence and Clear Vision*

Harmonizing zang-fu organs mainly involves regulating Liver Wood, invigorating the Spleen-Stomach, and connecting the Heart-Kidneys. When zang-fu organs are harmonious, Qi and blood generate the source, abundance in essence and Qi, contributing to the eyes’ normal growth and development. Wang Xinyu and others [3] used “One Finger Zen” to treat myopia by targeting acupoints such as Taixi, Xingjian, Dadun, Ganshu, and Taichong along the lower limbs’ Liver and Kidney meridians. This aligns with the notion from “The Yellow Emperor’s Inner Classic - Five Constant Factors (《黄帝内经·素问五常政大论》)” that treating the lower can alleviate the upper, addressing Yang imbalances to manage Yin imbalances (在上取之下，谓如阳病者治其阴，上壅者疏其下也). The clear Liver and Mingmu acupoints promote the downward movement of head and face warmth, thereby supporting Liver and Kidney nourishment for the eyes. Manipulative therapy focusing on tonifying the Spleen and improving

vision, combined with the foundation of clearing meridians around the eyes, head, and neck, involves additional techniques like rubbing Zusanli, the Bladder meridian, and kneading the back (focusing on Shenshu, Pishu, Sanyinjiao, and Ganshu). The results showed significant improvements in symptom scores and physical signs [15]. Pediatric manipulative therapy for myopia by Liu, characterized by “Five Meridian Pairings - Treating Zang with Meridians,” combined with the physiological characteristics of pediatric zang organs’ “three deficiencies and two excesses,” found notable improvements in eye symptoms by targeting specific acupoints such as “clear Liver meridian, tonify Kidney meridian, tonify Spleen meridian, tonify Lung meridian, and clear Heart meridian” in addition to conventional eye massage [16].

5. Conclusion

The widespread use of electronic devices in modern society has significantly increased the frequency and intensity of close-range and fine-eye use, posing a grave challenge to the prevention and control of myopia, a situation that cannot be taken lightly. Presently, Western medical approaches to myopia control carry certain safety risks and exhibit inadequate efficacy in managing myopia progression. Traditional Chinese Medicine, stemming from a holistic perspective, holds certain advantages in alleviating visual fatigue and delaying myopia progression. TCM believes that meridian blockages and disharmony among zang-fu organs constitute the fundamental pathogenesis of myopia. Effectively controlling myopia can be achieved by clearing meridians and harmonizing zang-fu organs. Specifically, clearing the meridians around the eyes, neck, and shoulders can alleviate chronic stiffness resulting from prolonged desk work, thereby facilitating the smooth flow of Qi and blood and nourishing the essence for clear vision. During childhood and adolescence, when zang-fu organs are relatively immature, there is a susceptibility to disorders like Spleen-Stomach disharmony, Liver blood imbalance, and Heart-Kidney imbalances. Manipulative therapy targeting zang-fu organs can regulate the functions of the Spleen-Stomach, harmonize Liver meridian Qi and blood, and balance the Heart-Kidneys, thus ensuring a biochemically rich environment in the eyes and the normal functioning of distant vision. Therefore, based on the meridians and zang-fu organs theory, clearing meridians and harmonizing zang-fu organs can effectively prevent and control myopia.

In clinical practice, precise treatment targeting meridian blockages and zang-fu organ disharmony significantly enhances the effectiveness and efficiency of myopia prevention and control. Addressing cervical joint disorders through manipulative therapy or easing muscle stiffness in the neck region through tendon relaxation massage may yield remarkable results. Furthermore, previous research has inadequately explored differential acupoint selection, failing to fully demonstrate the holistic advantages of traditional Chinese medicine in treating myopia. It is imperative to expedite the application of TCM zang-fu organ differentiation in the field of myopia, devising corresponding treatment plans based on zang-fu organ differentiation and objectively evaluating the holistic advantages of traditional Chinese medicine in treating myopia using the traditional Chinese medicine syndrome scoring system.

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