

Research Progress on Acupuncture Treatment for Optic Neuropathy

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Abstract: *Optic neuropathy mainly includes diseases such as optic neuritis, anterior ischemic optic neuropathy, optic disc edema, optic nerve atrophy, optic nerve tumors, and optic disc dysplasia, among which anterior ischemic optic neuropathy is the most common. In clinical practice, Western medicine often uses hormone therapy and symptomatic treatment, but the therapeutic effect is not satisfactory; Acupuncture therapy, as the main treatment, has a good effect on the continuous recovery of visual impairment after acute Western medicine treatment. This article focuses on the treatment effect of acupuncture therapy on optic neuropathy, hoping to provide inspiration for clinical and scientific researchers, in order to promote the improvement of clinical diagnosis and treatment technology, and to treat low vision patients caused by optic neuropathy.*

Keywords: Acupuncture, Optic neuropathy, Traditional Chinese medicine treatment, Western medicine treatment, Traditional Chinese and Western Medicine Treatment.

1. Introduction

Optic neuropathy is a common ophthalmic disease and the main cause of vision loss or decline in middle-aged and elderly populations. At present, the diagnosis and treatment of acute optic nerve diseases are highly valued, but there is insufficient clinical attention to the decline in visual function caused by intracranial tumor surgery and acute lesions. Many patients have achieved significant results through comprehensive therapy mainly based on acupuncture [1]. Patients often benefit from getting rid of blindness and disability, and it is necessary to summarize, improve understanding, and find commonalities. Therefore, we conducted a relevant review on the effect of acupuncture treatment on the recovery of visual function in optic neuropathy, in order to provide reference for further research and the formation of diagnostic and therapeutic techniques or plans.

2. Western Medicine Etiology and Pathology

Optic neuropathy mainly includes optic neuritis, anterior ischemic optic neuropathy, optic disc edema, optic nerve atrophy, optic nerve tumors, abnormal optic disc development, etc. Among them, anterior ischemic optic neuropathy and optic neuritis are the most common [2]. Among them, anterior ischemic optic neuropathy is caused by posterior ciliary artery circulation disorders leading to insufficient blood supply to the optic nerve papilla, resulting in acute hypoxia and edema of the eyes. Optic neuritis is mainly idiopathic, often caused by viral infection and weakened immune system, leading to inflammatory edema of the optic nerve, continuous development, atrophic changes in nerve fibers, and decreased vision. Pathologically, optic neuropathy is characterized by ischemia of the short posterior ciliary branches supplying the anterior and parietal regions of the optic disc, leading to local infarction; Factors such as inflammation of the ophthalmic artery, arteriosclerosis, or embolism, increased blood viscosity, such as polycythemia, leukemia, etc, can also cause local infarction of the optic nerve. Some factors, such as

hypoperfusion of blood flow in the eye, such as systemic hypotension, carotid or ophthalmic artery stenosis, acute blood loss, and increased intraocular pressure, are also related to the onset of the disease. Infectious diseases can also cause local neuropathy of the optic disc, especially caused by viruses, and virus mediated immune response, which is also an important cause of optic neuropathy.

After onset, the acute phase is mainly characterized by inflammatory edema of optic disc nerve fibers, ischemic or infectious. Persistent edema can worsen visual impairment, and in severe cases, it can be lost, manifested as light perception, index/front of the eye, etc [3]. If edema is relieved, optic disc morphology is restored, blood circulation is improved, and the conduction function of nerve cells shows reversible changes, vision will improve. If the invaded limited nerve fibers are severely ischemic, causing local necrosis or atrophy, making visual recovery difficult, the damage to the disc spot bundle is most likely to cause severe visual impairment. For optic neuropathy in the edema and atrophy stages, promoting the recovery of nerve fiber function with reduced function can significantly improve vision and have important value in improving the quality of life of patients.

3. Traditional Chinese Medicine Etiology and Pathogenesis

In traditional Chinese medicine ophthalmology, optic neuropathy belongs to the category of sudden blindness. In the book "Examining Yao's Letter: Violent Blindness", it is said that if this disease is caused by yang related injuries, due to anger and rebellion, indulging in excessive alcohol and spicy food, being dry and greasy, and suffering from fever, phlegm, and fire for a long time, people will become irritable and thirsty; if it is caused by yin related injuries, people will have multiple desires for sadness, exhausted thoughts, and crying too frequently... Those who are injured by the gods will be extremely sad due to excessive thinking and lack of care... People with insufficient water and energy will experience dizziness and blindness. Those who can maintain themselves

will heal on their own, while those who cannot maintain themselves after illness will become chronic diseases. Based on clinical observation, it can be summarized as follows: six external factors or excessive liver fire caused by the five meridians, disturbance along the liver meridian, and burning of the eyes leading to the onset of the disease; Excessive sadness, emotional distress, or intense anger, loss of liver function, stagnation of qi, obstruction of the eye system, and suppression of divine light; Or excessive emotions can intensify the fire, with qi and fire attacking upwards, and blood stasis and pulse obstruction in the eye system; Fever can cause damage to yin or deficiency of the body's yin, depletion of yin essence, lack of water to nourish fire, endogenous deficiency of fire, and inflammation of the upper nervous system; Long term illness with physical weakness, or weakness of the body, or postpartum anemia, deficiency of qi and blood, and loss of eye nourishment. The obstruction of the eyes and orifices prevents the infusion of essence and qi into the eyes, resulting in a lack of visibility.

4. Diagnosis and Differentiation

Western medicine has made significant contributions to the diagnosis of optic neuropathy. Based on the clinical manifestations of this disease, targeted examinations, including imaging and laboratory tests, can provide reliable evidence for accurate diagnosis and differential diagnosis. Patients with optic neuritis often present with a sharp decline in vision, accompanied by eye pain or dull pain during eye movement; Ischemic optic neuropathy is characterized by sudden loss of vision, which often occurs in the morning or after sleep, without eye movement pain [4]. Some blood tests for idiopathic optic neuritis can indicate viral infection or abnormalities in immune related indicators. Head and orbital imaging examinations can exclude optic nerve lesions caused by physical factors such as intracranial space occupying lesions and optic nerve compression.

5. Treatment Methods for Optic Neuropathy

5.1 Western Medicine Treatment

Hormone shock therapy is commonly used in clinical practice, which involves intravenous infusion of 1g methylprednisolone in 2-4 doses per day. After three days of continuous use, oral prednisone acetate at a dose of 1mg/(kg·d) is taken in the morning and gradually reduced. Alternatively, high-dose methylprednisolone shock therapy, 500mg/time, once a day, 5-7 days, combined with post ball dexamethasone 5mg injection, can rapidly alleviate papilledema and shorten the edema period to 2-4 weeks [5]. Administer gastric mucosal protectants and calcium supplements while treating with glucocorticoids throughout the body. Targeted treatment should be given to individuals with abnormal blood viscosity, blood pressure, blood lipids, and blood glucose levels. Depending on the patient's condition, options such as calf blood protein extraction solution, Xuesaitong, Danshen polyphenolic acid, and Kudiezi injection can be used. It has a significant therapeutic effect on visual prognosis.

5.2 Traditional Chinese Medicine Treatment

5.2.1 Formula selection

The commonly used formula for liver meridian heat syndrome is Longdan Xiegan Tang, which can be modified by adding summer dry grass and cassia seed to enhance the function of clearing the liver and purging fire; Danzhi Xiaoyao San or Xiaoyao Siwu Tang with modifications are commonly used for liver depression and qi stagnation syndrome. The main pathogenesis of this disease is liver stagnation and qi stagnation, blood stasis and obstruction. Chai Hu, Yu Jin, and Zhi Shi, which are products that soothe the liver and promote qi, are used in combination with some blood activating drugs. Chaihu, as a royal medicine, has the effect of soothing the liver and relieving depression; Danggui nourishes blood and blood, with a pungent and fragrant taste, known as a blood qi medicine; White peony is slightly cold, nourishing blood, softening liver, and relieving urgency; Gui, Shao, and Chai Hu are used together to nourish the liver and aid in its function. When the blood is balanced, the liver becomes harmonious, and when the blood is full, the liver becomes soft. Together, they are considered medicinal herbs; Atractylodes macrocephala, Poria cocos, and Glycyrrhiza uralensis are used as adjuncts to invigorate the spleen and stomach, as well as to nourish the liver and qi. In addition, Danpi and Gardenia jasminoides are added to clear and tonify the liver and heat [6].

Xiaoyao Siwu Tang is composed of Chaihu, Shengdi, Danggui, Chishao, Chuanxiong, Atractylodes macrocephala, Poria cocos, Licorice, and Peppermint, which have the effects of clearing liver qi and promoting the circulation of qi and blood. In Xiaoyao Siwu Tang, Chaihu Xin is used to relieve bitterness, soothe the liver and relieve depression, and promote liver qi circulation; Ligusticum chuanxiong can relieve stagnation and regulate qi and blood. Together, the two herbs act as a royal medicine, clearing liver qi and promoting the flow of qi and blood. Angelica sinensis is warm in nature and bitter in taste, with the ability to nourish blood and promote blood circulation; Red peony has a slightly cold nature and a bitter taste. It nourishes blood, softens the liver, and has a slow and urgent effect. Angelica sinensis and peony are used together as medicinal herbs to nourish the liver and blood. Liver depression can lead to spleen qi deficiency and dysfunction of circulation, resulting in poor blood circulation. Therefore, the use of Atractylodes macrocephala and Poria cocos can enhance the spleen and qi, promote the circulation of qi and blood circulation, and nourish the blood. It can not only strengthen the soil and prevent wood damage, but also promote the transformation of blood into active energy. The combination of the two is used as an adjuvant medicine. Licorice blends various medicines to invigorate the spleen and nourish qi; Mint helps Chaihu to soothe the liver and relieve depression, and the combination of the two drugs is effective. All medicines should be used together to soothe the liver and qi, relieve liver depression, nourish the liver and blood, regulate qi and blood, and treat wood and soil together, achieving the effect of regulating wood, blood and soil.

The commonly used Blood Fu Zhuyu Decoction for Qi Stagnation and Blood Stasis Syndrome is modified and adjusted [7]. For patients with sunny syndrome, they can take appropriate amounts of gardenia, mulberry leaves, and chrysanthemums to clear heat and improve vision; The commonly used modified Zhibai Dihuang Pills for Yin deficiency and Fire excess syndrome can be supplemented

with Danshen and Maodongqing to help promote blood circulation and remove blood stasis. For patients with a preference for Yin syndrome, they can take appropriate amounts of Astragalus membranaceus, Poria cocos, and Atractylodes macrocephala while undergoing acupuncture to supplement Qi and blood, strengthen the spleen and stomach, regulate qi, and strengthen the foundation; The commonly used Ginseng Nourishing Rongtang for Qi and Blood Deficiency Syndrome can be modified by adding Danshen, Acorus tatarinowii, and Chicken Blood Vine to promote blood circulation and nourish blood.

5.2.2 acupuncture treatment

Scalp acupuncture is a combination of Chinese medicine acupuncture and moxibustion experience and modern neuro cerebral projection area. Select the projection of human brain vision based on the functions of different parts of the cerebral cortex. Location: Starting from the intersection point of a parallel line 1 cm away from the midline and the horizontal line of the occipital protuberance, draw 4 cm upwards and pierce 2.5 cm horizontally towards the neck along this line. Acupuncture in the projection area of the visual cortex has the effects of soothing the liver, improving vision, promoting smooth circulation of qi and blood, and strengthening the foundation and nourishing the body, making the patient's eyes clear and the body in a state of yin-yang balance [8]. The selected acupoints for acupuncture include Zanzhu, Taiyang, Jingming, Sibai, Guangming, Chengxie, Baihui, Sishencong, Fengchi, Yiziliao, Sizhukong, and Yuyao. Jingming, Cunzhu, and Sizhukong are all acupoints taken around the eye socket. The acupoints around the eye have the function of regulating the meridians and organs around the eye, promoting qi circulation, activating blood circulation, and opening the eyes. As the acupoint of the Foot Yangming Meridian, Chengxie is located between the eyeball and the infraorbital margin, and has the function of harmonizing qi and blood in the eye; The bamboo stick is located at the incision on the orbit and has the effect of improving eyesight; The Sun is a unique acupoint located on the temporal side. Acupuncture at three acupoints simultaneously can improve local blood circulation in the eyes and enhance the metabolism of the optic nerve, retina, and choroid tissues. The acupoints selected for acupuncture are the temple, the bamboo hole, the fish waist point, and the silk bamboo hole, which surround the head and eyes, following the treatment method of selecting acupoints from the far side [9].

Fengchi, Baihui, and Sishen Cong are all acupoints on the head. Fengchi, located in the neck, below the occipital bone, at the same level as Fengfu, is a depression between the sternocleidomastoid muscle and the upper end of the trapezius muscle. Its location is related to the functions of the brain, and the optic nerve passes through it. Therefore, needling Fengchi can benefit the eyes, clear the ears, and have a good effect on strengthening the brain and awakening the mind; Baihui is known as the key acupoint of the Du meridian, which has a good effect of nourishing qi, promoting body yang, and enhancing optic nerve function; As a unique acupoint outside the meridians, the Four Divine Congs, when combined with Tai Chong and Feng Chi, can have the effect of promoting meridian circulation and activating collaterals.

Use the Shangxing acupoint on the Du meridian and the Guangming acupoint on the Foot Shaoyang Gallbladder Meridian to generate clear qi and brighten the eyes. As a collateral point of the Foot Shaoyang Gallbladder Meridian, Guangming connects the liver, gallbladder, qi, and blood with the whole body. As the source of the Hand Yangming Meridian, the Pairing Point Hegu Point reaches upwards to the near eye area of the face. Acupuncture is used to clear meridians, nourish qi, and improve vision; Paired with the Zusanli acupoint of the Yangming Stomach Meridian, it replenishes qi and blood, and solidifies the source. Hegu acupoint is an important acupoint for treating head and facial diseases, which is referred to as "face mouth Hegu Shou" in ancient books; The combination of Taichong and Hegu is called the Four Passes point. Taichong point is used as the input point and original point of the Foot Jueyin Liver Meridian, while Hegu point is used as the original point of the Hand Yangming Meridian. Acupuncture these four points is clinically known as opening the Four Passes point, which can play a role in soothing the liver, promoting bile flow, relieving depression, activating meridians, activating collaterals, and relieving pain.

Add Zusanli, Sanyinjiao, and Taixi to the acupoint matching. Zusanli is a key acupoint for health care, and when combined with acupuncture, it can help replenish qi, strengthen the spleen, nourish the stomach, and promote blood circulation. Because San Yin Jiao is the intersection point of the Foot Tai Yin Spleen Meridian, Foot Jue Yin Liver Meridian, and Foot Shao Yin Kidney Meridian, and also serves as the source of Qi for the Three Yin Meridians, the Tai Xi acupoint combined with the Foot Shao Yin Meridian can have the effect of strengthening the spleen, removing dampness, and nourishing the liver and kidneys. Acupuncture these acupoints, treating both the symptoms and root causes, combining remote and proximal acupoint selection, jointly plays a role in soothing the liver, regulating qi, replenishing qi, promoting blood circulation, and improving menstruation and vision. It can provide more effective treatment for this disease.

Modern medicine shows that improving microcirculation of eye blood flow and increasing oxygen and energy metabolism in ischemic areas; Reduce retinal damage and decrease the death of visual ganglion cells; Enhance the excitability of the visual cortex and promote the transmission of nerve impulses in the visual cortex; Immune bidirectional modulation, protecting retinal nerve cells, promoting nerve tissue repair, and improving visual function. Acupuncture can change the current situation of optic nerve damage. Acupuncture on the head can have a good therapeutic effect on the damage of the posterior cerebral artery. It can accelerate abnormal arterial blood flow and slow down excessive arterial blood flow, keeping the blood flow velocity at an appropriate level. Acupuncture can widen the central retinal artery and increase the circulating blood volume in the retina. Because scalp acupuncture has such an effect, it changes the abnormal blood flow of the posterior ciliary artery, increases the perfusion of the optic disc, fills the optic nerve, and improves eye symptoms [10].

5.2.2 Acupuncture techniques and precautions

The techniques used for needling different acupoints are also

different. Finding the exact location of acupoints is important, but the correct technique of needling is also essential. After injecting the needle, quickly lift and twist it in a small amplitude, and leave the needle for 30 minutes. 1) When needling the eyes, ask the patient to close their eyes and the doctor to slowly squeeze the eyeball outward with their fingers to increase the gap for needle insertion and maintain a fixed state of the eyeball to prevent injury. The needle tip should be biased towards the inner wall of the orbit, but avoid close contact. Slowly insert 0.2 to 0.6 inches at an angle of 85° towards the posterior outer side, and the depth can reach 1 to 1.5 inches. Cannot be inserted or twisted significantly. 2) When needling the Chengxue acupoint, the preparation stage is the same as needling the Jingming acupoint. With one hand, slowly insert the needle along the infraorbital edge by 0.5-0.8 inches, and it is not suitable for techniques such as lifting, twisting, etc. 3) When stabbing the temple, you can stab it inward by 0.5 inches. 4) When needling Fengchi, the tip of the acupuncture and moxibustion needle was slightly downward and tilted 0.5 to 0.8 inches in the direction of the tip of the nose. Because the deep part of the anatomical part was the location of the medulla oblongata, the needle inserter was required to firmly grasp the angle and size of the needle. 5) When needling the Hegu acupoint, it is important to have the patient in a semi clenched fist position and insert the needle from a vertical direction, reaching 0.5 to 1 inch. If the patient feels a moderate sense of soreness and swelling, it indicates that the injection has been effective; It is also possible to insert the needle at a 20 degree angle to the skin, tilting it into the wrist and palm joint by 1 to 1.5 inches. When the patient feels a tingling sensation, the needle can be appropriately spread upwards to the shoulders and elbows according to the actual situation, which will achieve better therapeutic effects [11].

5.2.3 Drug injection therapy at acupoints around the eyes

According to the traditional meridian theory of traditional Chinese medicine and the theories of both Chinese and Western medicine, a small amount of medication is injected into acupoints based on their effects and drug properties to treat eye diseases. The main acupoints include: Taiyang, Yuyao, Sizhukong, Sibai, Hegu, Yangming, Sanyinjiao, Zusanli, and Waiguan. Injected drugs include drugs that nourish the nerves, vitamins, and drugs that promote blood circulation and remove stasis. The ocular acupoint drug injection therapy has the characteristics of simple operation, low dosage, wide indications, and rapid action. It is characterized by its simplicity, stable efficacy, and ease of clinical observation [12]. The most commonly used method in clinical practice is subcutaneous injection of compound camphorazine on the temporal side, which has significant therapeutic effects on optic neuropathy. This treatment technology, based on the internal requirements of clinical technology upgrading, adopts a comprehensive treatment method of integrated traditional Chinese and western medicine, discards its dross and takes its essence, especially in the ophthalmic outpatient clinics of general hospitals, which has far-reaching value. On the one hand, it is conducive to improving the current situation of low acceptance of the characteristics of traditional Chinese medicine among Western ophthalmology peers, promoting the recognition of Western medicine experts, and thus promoting the popularization of conservative treatment experience and

characteristics of traditional Chinese medicine. On the other hand, a large number of patients' diagnosis and treatment willingness and medical needs are not met. Therefore, choosing appropriate and validated injection drugs, using the temporal temple or other acupoints around the eyes as injection sites to treat optic neuropathy has application prospects.

6. Conclusion

In summary, in clinical practice, Western medicine often adopts hormone shock therapy for the treatment of this disease, which is relatively limited in form. However, the treatment method of acupuncture combined with traditional Chinese medicine can vary in form, and acupuncture points and traditional Chinese medicine can be taken according to the actual situation of different patients. However, the effective time of traditional Chinese medicine treatment is relatively slow. Therefore, in clinical practice, we should adopt a comprehensive treatment method of integrated traditional Chinese and western medicine, remove the dross, select the essence, combine the advantages of the two, give full play to the best clinical efficacy, better alleviate the pain of patients, and better serve patients.

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