

Research Advances of the Method of Replenishing Deficiency and Removing Dirty Stasis in the Treatment of Wet Age-Related Macular Degeneration

Zhihua Han^{1,a}, Xuemei Wu^{1,b}, Lu Ji^{1,c}, Yini Wu^{1,d}, Sheng An^{2,e,*}

¹Shaanxi Provincial Hospital of Traditional Chinese Medicine, Xi'an, Shaanxi, 710003, China

²Medical Department, Research and Development Center, Shaanxi Momentum Qixue He Pharmaceutical Co., Ltd., Xi'an, Shaanxi, 71000, China

^a420635257@qq.com, ^b654798210@qq.com, ^c253687498@qq.com, ^d654879210@qq.com,

^e346657832@qq.com

*Corresponding author

Abstract: Wet age-related macular degeneration is a third-leading blinding eye disease that occurs mostly in people over 50 years of age, with loss of central vision as the primary symptom, and involves the macular area of the retina. By collating and analyzing literatures related to the treatment of wet age-related macular degeneration with traditional Chinese medicine in recent years, it was found that the main source of the etiology, pathogenesis, syndrome differentiation and treatment of the disease is the author's subjective clinical experience, there is no standardized and unified understanding, which makes the research results different and the treatment effect is not ideal. The article will analyze and summarize the etiology, pathogenesis, syndrome differentiation and traditional Chinese medicine treatment of wet age-related macular degeneration, which can provide drug guidance for clinical treatment and improve the therapeutic effect.

Keywords: Wet Age-Related Macular Degeneration, Chinese Medicine Treatment, Treatment Progress

1. Introduction

Wet age-related macular degeneration (wAMD) is a fundus disease characterized by progressive decline in central vision and involvement of the macular fovea. It occurs successively or simultaneously in both eyes and mainly affects older people older than 50 years [1]. A recent survey showed that more than 15million patients with wAMD were involved worldwide, and the number of patients is expected to double by 2050 [2]. Research shows that about 26.4% of patients will also develop wAMD in the contralateral eye if one eye has wAMD [3].

According to traditional Chinese medicine, wAMD is the late stage of AMD. With the physiological aging of the body, the visceral functions gradually become weak, and the deficiency of the functions of the liver, spleen and kidney leads to the dysregulation of Qi and blood in the whole body. Phlegm and blood stasis accumulate in the clear orifices, causing the atrophy and degeneration of the retinal tissues in the eyes. Many doctors analyze and summarize the etiology and pathogenesis of wAMD, and treat it according to syndrome differentiation, so that traditional Chinese medicine has achieved significant clinical efficacy in the treatment of wAMD. However, at present, the traditional Chinese medicine theory, clinical treatment principles and methods of wAMD are not unified, which should be further summarized to guide the clinical application and improve the clinical efficacy. The following will elaborate on the understanding of the etiology and pathogenesis of wAMD by the method of tonifying deficiency and resolving turbidity, and the treatment of traditional Chinese medicine.

2. Etiology and Pathogenesis

wAMD belongs to the category of "Blurred vision" in traditional Chinese medicine. Its pathogenesis mainly involves the kidney, spleen and liver (Figure1), and is related to the loss of essence, Qi and blood (Figure2). The syndrome types are mostly "liver and kidney deficiency", "Spleen Qi weakness" and "phlegm and blood stasis". According to Zhengzhi Zhunsheng [4], Blurred vision is the disease of liver and kidney deficiency, which is caused by Yin deficiency with less blood and semen

depletion. Traditional Chinese medicine believes that the pathological products such as water, dampness and sputum produced by the obstacles in the transportation and excretion of retinal vessels in the macula and are mostly tangible objects, belonging to the category of phlegm.

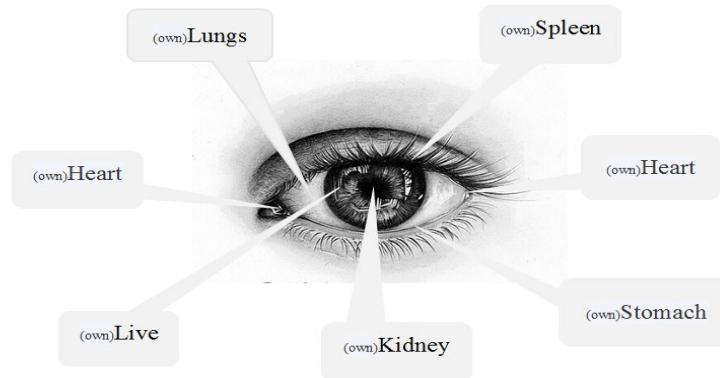


Figure 1: The relationship between the organs and the eyes

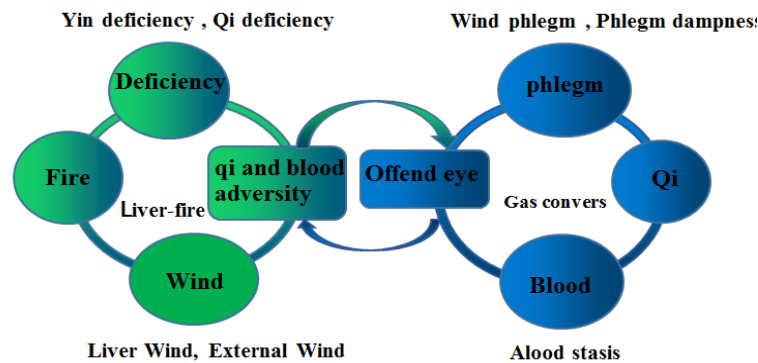


Figure 2: The relationship between the Phlegm dampness, Qi blood and eye disease

wAMD mostly occurs in elderly people, Zhuangzhengyuan [5] believes that this disease is an eye disease after physiological aging. Deficiency of visceral function mainly leads to the loss of kidney essence and the inability of essence to transform Qi, which is mainly in the early stage of wAMD, followed by the imbalance of Qi, blood and body fluid, and the bleeding of collateral injury is mainly in the late stage of wAMD, which is a process from deficiency to excess. Tangyouzhi [6] believed that the older people can reduce the Body's Function, kidney deficiency and loss of storage, energy consumption and Qi deficiency, driving weakness, Qi block, blood stasis after a long time, blood stasis can turn fire, fire heat can break through blood and act rashly; Qi deficiency has no right to control, body fluid / blood does not follow the normal path, resulting in bleeding, exudation and other pathological changes. Jin Ming [7] believed that the pathogenesis of CNV formation in wAMD is based on the deficiency of liver and kidney, and the disease course is long, lingering and difficult to heal, resulting in phlegm and blood stasis. Guanguohua [8] believed that wAMD was mainly due to deficiency of Qi of viscera, and deficiency of Spleen Qi was the main cause. According to this, we can see that the etiology and pathogenesis of wAMD is based on the deficiency of the liver, kidney and spleen, the spleen is not transported, and the turbid Qi offends the eyes; Phlegm and blood stasis are caused by the loss of liver drainage, obscuring the divine light; Deficiency of Yin in the body will lead to virtual fire ascend and burn the eyes; The deficiency of liver and kidney leads to the loss of nourishment and function of the eyes. When the disease develops further, phlegm, dampness and blood stasis appear, so the disease belongs to Virtual is fundamental, real is standard.

3. Syndrome Differentiation Analysis

3.1 Deficiency of Viscera

The elderly people are the main affected population of wAMD. The function of the liver and kidney are deficient, the pupils will become dim. The spleen deficiency lead the Qi and blood to unsmoothly

flow, and the vision is unclear. Lidongyuan's Secret collection of the orchid room [9] said: "the essence and Qi of the five zang organs are all received by the spleen and run through the eyes, so if the spleen is deficient, the essence and Qi are lost and cannot be attributed to the eyes." It emphasized that the kidney, liver and spleen are closely related to wAMD.

The meridians of the liver are connected to the eye. Clear vision needs the catharsis of liver qi and the nutrition of liver blood, and the sufficient essence and Qi stored in the kidney. If the kidney essence is sufficient, then vision is clear. If the spleen controls normally blood flows through the vein, the eyes are warm and healthy, and the vision is clear.

At the beginning of the onset of wAMD, spleen qi deficiency, blood and body fluid, conversion disorders. Ultimately leading to kidney deficiency. Kidney deficiency leads to the loss of essence and Qi. The homology of liver and kidney, the loss of liver blood, the emptiness of the orifices, the loss of nourishment to the eyes, and the blurred vision. Spleen deficiency leads to the transformation of essence disorders, the stagnation of water and dampness, and the accumulation of dampness generates phlegm; The kidney qi deficiency, the transpiration and gasification lack, the water and moisture metabolism is blocked and retained in the eyes, then produces the drusen, exudation and other pathological phenomena in the retina. For a long time, phlegm dampness transforms fire and burns blood vein, and blood overflows outside; Spleen deficiency leads to blood uncontrolled, blood does not follow the vein and overflows outside, bleeding for a long time forms blood stasis, phlegm and blood stasis aggravate the condition, so choroidal neovascularization and scar formation appear. Its essence is caused by the disturbance of visceral function involving the eyes.

If the liver, kidney and spleen are deficient, and Qi and blood cannot nourish the eye, vision is blurred. Therefore, the deficiency of liver, kidney and spleen is the pathological basis of wAMD.

3.2 Phlegm Dampness and Stasis

The deficiency of spleen and stomach is the late stage of wAMD. Spleen deficiency led to insufficient generation and conversion of Qi and blood, and Qi does not control blood; spleen Yang deficiency, accumulation of dampness and phlegm, turbid toxin internal.

Qi deficiency promotes weakness and overall absorption dereliction of duty, which leads to blood stasis, blood overflowing outside, resulting in hemorrhage and exudation in macular. Spleen deficiency causes weakness in transport and transformation, the stagnation of water and dampness, and the accumulation of dampness generates phlegm, resulting in macular dystrophy, retinal anemia, and neovascularization. "On spleen and stomach · Spleen and stomach deficiency is nine orifices not open" [10]: "Qingyang does not rise, and the nine orifices are not conducive". Therefore, spleen and stomach weakness is the initial pathogenesis of wAMD, and wet, phlegm, stasis, water, turbidity and other signs can appear.

Based on liver, spleen and kidney deficiency, secondary "phlegm", "wet", and "stasis" are always attributed to a "turbidity". Liver, spleen and kidney deficiency, phlegm turbidity, and blood stasis lead to eye dystrophy, and form an environment of ischemia and anemia, resulting in retinal neovascularization, and then the formation of organic matter, and the occurrence of wAMD.

4. Principles and Methods

The pathogenesis of wAMD is closely related to the liver, kidney, and spleen. The liver governs the storage of blood and the regulation of liver qi, ensure sufficient Qi, blood and essence, which nourishes the eyes; If the kidney essence is abundant and the marrow sea is full, then the thinking is flexible and the vision is sharp; The spleen transports water and grains, with sufficient qi and blood generation and conversion, orderly ascending and descending, and warm and nourishing eyes. By tonifying the input of the organs' essence, qi, and body fluids to the eyes, the normal distribution and excretion of water, grain and essence can clear the vision and maintain its visual function.

To sum up, it can be seen that deficiency of liver, kidney and spleen is the origin, blood stasis, phlegm and dampness are the targets, so treatment should be based on both origin and targets. Therefore, the treatment methods should be nourishing the three organs, invigorating the spleen for dampness, warming the spleen for dampness, invigorating the spleen for Qi regulation, removing turbidity and detoxification, supplemented with the treatment methods of resolving phlegm and dispersing nodules, hemostasis and removing blood stasis, or activating blood circulation and

unblocking the pulse. "Tonifying deficiency" refers to invigorating the spleen and liver and kidney. "Resolving turbidity" refers to promoting dampness and resolving phlegm. Fundus edema caused by wAMD is mostly caused by moisture accumulation, which is treated by dehumidification, while exudation is mostly caused by phlegm, which is treated by expectoration. Neovascularization belongs to blood stasis, which is treated by removing blood stasis, and organic chemicals belong to knot, which should be treated by dispersing knot.

4.1 Oral Administration of Traditional Chinese Medicine

Nourishing the liver and kidney: Li Jing[11] treated wAMD patients with oral guishaodihuang decoction and intravitreal injection of conbercept. The results showed that the best corrected visual acuity, the central macular retinal thickness, the fundus hemorrhage exudation and the clinical effective rate were better than that of the control group after treatment. Zhou Xuan [12] treated wAMD patients with oral Bushen Huoxue Decoction and intravitreal injection of conbercept for 12 weeks. After 12 weeks of treatment, the visual acuity of the treatment group was better than that of the control group ($P < 0.05$). The retinal thickness of the treatment group was significantly smaller than that of the control group ($P < 0.05$).

Jianpi Liqi: Zhang Qiaoling[13] selected 104 patients with wAMD, the control group was treated with conventional Western Medicine, the treatment group was treated with Jianpi Zishen fuming decoction. After 3 months of treatment, the results showed that the total effective rate of the treatment group was 68.06% higher than 52.05% of the control group ($P < 0.05$); Liu an [14] treat wAMD used the traditional Chinese medicine of invigorating spleen and Qi, removing dampness and eliminating phlegm. The results showed that the improvement rate of visual acuity after treatment was 77.14%. About bleeding and exudation, 12 eyes were completely absorbed, 18 eyes were basically absorbed, and 4 eyes were partially absorbed. After FFA examination, 10 eyes had no leakage, 19 eyes had mild leakage, and the total clinical effective rate was 77.14%.

Activating blood circulation and removing blood stasis: Yu Lei [15] treated wAMD patients with oral Liangxue Huayu Decoction Combined with intravitreal injection of conbercept for 3 months. The results showed that the retinal thickness of the treatment group was significantly lower than that of the control group at 6 months and was lower than that of the control group at 12 months. The recurrence of macular edema within 12 months was (85.7 ± 18.1) d in the treatment group and (53.7 ± 12.3) d in the control group ($P = 0.000$). Menglixia[16] used Taohong Siwu Decoction orally combined with intravitreal injection of ranibizumab to treat patients with wAMD for 2 months. The results showed that the total clinical effective rate of the treatment group was 97.73%, and the best corrected visual acuity after treatment in the treatment group was significantly higher than that in the control group; The choroidal thickness in the treatment group was significantly lower than that in the control group. The leakage reduction rate of the treatment group was higher than that of the control group, and the difference was statistically significant ($P < 0.05$).

Based on the above, deficiency of liver, spleen and kidney is the basis of the onset of wAMD and runs through the disease. Phlegm dampness and blood stasis is the pathological product of deficiency of organs in wAMD, and it is also a sign of disease progression. In view of the inclusion of deficiency and excess in this disease, the method of tonifying deficiency and resolving turbidity focuses on deficiency on the one hand, and achieves the purpose of tonifying liver, kidney and spleen through tonifying deficiency, on the other hand, the turbidity formed over time is excess, and then relieves and expels the turbid pathogens in the body through eliminating dampness and resolving phlegm, and finally achieves the purpose of treatment. Therefore, the method of tonifying deficiency and resolving turbidity has the effect of treating both symptoms and signs in the treatment of wAMD, which is worthy of further research and application [17].

5. Conclusion

At present, the advantages of traditional Chinese medicine in the treatment of wAMD are increasingly significant, and it is a new trend and breakthrough in the treatment. Based on the deficiency of the disease, the scientific formulation and clinical efficacy are more significant, providing a new idea for the treatment of wAMD. However, due to the complexity and diversity of traditional Chinese medicine prescription, its clinical promotion is limited. Therefore, improving the standardized understanding of the etiology and pathogenesis of wAMD, dialectical analysis, reaching a unified consensus, and forming a perfect clinical treatment guide can further improve the quality of life of

patients and improve the clinical prognosis of patients.

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