Social Medicine and Health Management (2024)
Clausius Scientific Press, Canada

DOI: 10.23977/socmhm.2024.050114
ISSN 2616-2210 Vol. 5 Num. 1

Research Progress of Traditional Chinese and Western Medicine on Residual Symptoms after Reduction of Benign Paroxysmal Positional Vertigo

Xinrui Jiang[1,a], Hai Lin[2,b,*]

[1]Shaanxi University of Chinese Medicine, Xianyang, Shaanxi, China
[2]The Affiliated Hospital of Shaanxi University of Chinese Medicine Xi'an, Xi'an, Shaanxi, China
[a]1286435738@qq.com, [b]Linhai626@163.com
[*]Corresponding author

Keyword: Benign Paroxysmal Positional Vertigo, Residual Disease after Reduction, Pathogenesis Research Progress of traditional Chinese and Western Medicine

Abstract: Benign paroxysmal positional vertigo is one of the most common vestibular peripheral diseases, which is characterized by recurrent transient vertigo and characteristic nystagmus caused by changes in head position relative to gravity. The annual prevalence rate of BPPV is about 1.6%, accounting for 20.30% of vestibular vertigo, which is usually high after the age of 40, and the incidence shows an upward trend with age. At present, the common treatment methods in western medicine are otolith reduction and drug therapy. Manual reduction is a common and effective reduction method for the treatment of otolithiasis. However, many reports have confirmed that there are many residual symptoms such as dizziness and instability after reduction. Western medicine is often used to improve circulation, dilate blood vessels and other drugs for symptomatic treatment, such as betastine, ginkgo biloba extract, etc., often the efficacy is not good, and even depression, restlessness and other symptoms, seriously affecting the life and work of patients. Therefore, rapid and effective relief of residual symptoms in patients with BPPV after reduction has gradually become the focus of clinical research in recent years. This article reviews the research progress of traditional Chinese and western medicine on residual symptoms after BPPV reduction.

1. Introduction

BPPV is a peripheral vestibular disease induced by the change of head position relative to the direction of gravity, characterized by recurrent transient vertigo and characteristic nystagmus. It is often self-limited and prone to recurrent attacks. The main manifestation of vertigo is shown in Figure 1. The rapid development of BPPV examination technology and the continuous improvement of diagnostic criteria have led to great differences in epidemiological data in different periods. So far, the reported annual incidence rate is (10.7-600) / 100000, the annual prevalence rate is about 1.6%, and the end-life prevalence rate is about 2.4%. BPPV accounts for 20% to 30% of patients with vestibular vertigo, with a male-to-female ratio of 1:1.5 to 1: 2.0. The incidence is

usually high after the age of 40, and the incidence increases gradually with age [1-2]. At present, the common treatment methods in western medicine are otolith reduction and drug therapy, and manual reduction is a common and effective method for the treatment of otolithiasis. The reduction mechanism is based on the otolith theory [3-4], including the ampullary crest cap stone hypothesis and the semicircular canal stone hypothesis [5-6].The mechanism of vertigo production is based on the anatomical structure of the otolith, as shown in Figure 2. Although manual reduction has achieved good results, some studies have found that 61.2% of patients still have residual symptoms(RD) such as dizziness, unstable walking, floating sensation, fear and so on [7-8]. And due to repeated attacks of dizziness, patients can be overworried, emotional disorders and other manifestations, can be complicated with chronic subjective dizziness (CSD). Therefore, the residual syndrome after reduction seriously affects the quality of life of patients. The residual symptoms of BPPV after resetting are not recorded in Chinese medicine literature, and should belong to the category of "vertigo" in Chinese medicine according to clinical manifestations. Doctors of various dynasties wrote many works to discuss vertigo, which greatly enriched the understanding of vertigo in traditional medicine.

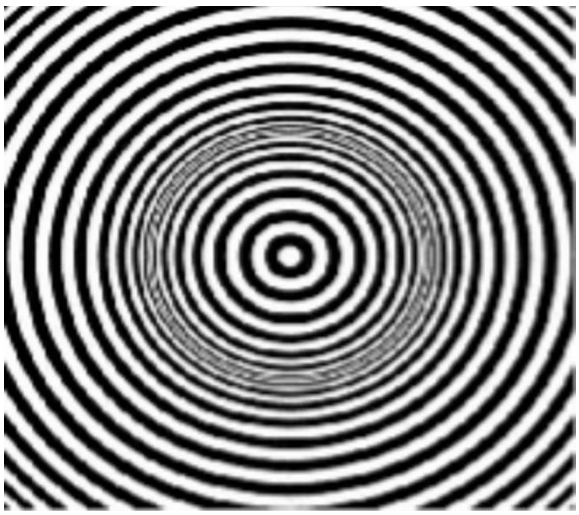

Figure 1: Vertigo

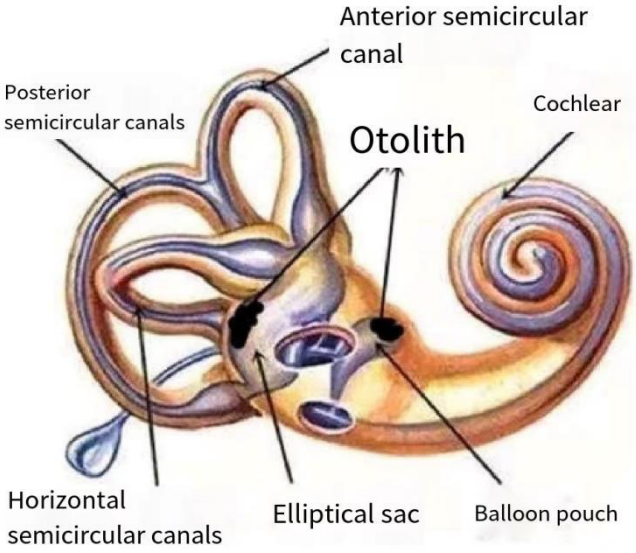

Figure 2: The anatomy of the otoliths

2. Study on the Pathogenesis and influencing factors of RD by Western Medicine

2.1 Pathogenesis of Western Medicine

The mechanism of residual symptoms after successful otolith reduction is still unclear and may be related to the following reasons: first,1 the mechanism of co-disease, that is, the dysfunction of the peripheral otolith and its conduction pathway or the vestibular system itself. Second, after otolith reduction, there are still a small amount of sediment-like otolith fragments, but not enough to cause obvious positional vertigo and nystagmus. A third possible mechanism is central readjustment after otolith reduction. A fourth possible mechanism is the delay in otolith diagnosis and reduction. Fifth, psychological factors such as tension and anxiety caused by acute dizziness induced by BPPV lead to subjective dizziness [9]. Some studies have pointed out that the occurrence of [10] residual symptoms is related to age, sex, duration of vertigo before manual reduction, times of reduction, chronic basic diseases such as hypertension and diabetes, osteoporosis, serum vitamin D level, elliptical sac dysfunction, basic vestibular system diseases, incomplete reduction and so on. Therefore, the older the patient is, the longer the duration of vertigo before treatment, the more times of reduction, the more complicated with vestibular system diseases and chronic underlying diseases, the more likely to lead to residual symptoms.

2.2 Influencing Factors

Liu Xiaowei et al. [11] the study shows that the vestibular function gradually decreases with age, the dynamic balance of otolith production and absorption is destroyed, and there will still be small otolith fragments after manual reduction [12]. At the same time, aging degrades proprioceptive and visual functions, which tends to decrease balance function and increase the risk of residual symptoms [13]. The analysis of progression [14] shows that the decrease of estrogen secretion in postmenopausal women can lead to a decrease in bone mineral density and even osteoporosis, making otolith easy to fall off. Zhang Shu et al. [15] pointed out in the experimental study that the more the number of manual reduction, the more the number of otolith injury, the greater the possibility of residual symptoms. Zhou Zhiqiang et al. [16] think that suffering from chronic diseases (hypertension, diabetes, etc.) can lead to insufficient blood supply and steady imbalance of the inner ear through the corresponding mechanism or pathway, which reduces the stability of otolith and is easy to fall off. The disturbance of blood circulation in the inner ear can reduce the repair power of the inner ear, and it may fall off again even if it is successfully restored. Therefore, it is necessary to standardize the management of blood pressure and blood sugar in order to reduce the occurrence of residual symptoms. Elmoursy et al. [17] show that Serum vitamin D level and serum calcium concentration are necessary to maintain the normal critical calcium concentration in vestibular lymph to produce otolith. The lack of serum vitamin D level and serum calcium concentration may lead to abnormal metabolism of otolith function, structural change or displacement, and make residual symptoms more likely to occur.

3. Study on the Pathogenesis and influencing factors of RD in traditional Chinese Medicine

3.1 Etiology and Pathogenesis

Doctors of all ages have different views on the etiology and pathogenesis of vertigo. The disease of vertigo is located in the brain, which is closely related to the three organs of liver, spleen and kidney. The pathogenesis of vertigo can be divided into deficiency syndrome and excess syndrome. Deficiency patients have deficiency of qi and blood and deficiency of marrow sea, which leads to

loss of nourishment of clear orifices. Excess syndrome shows that wind, fire, phlegm and blood stasis disturb clear orifices. The basic pathological changes are mainly discussed from "deficiency and excess". Among them, there are dizziness caused by deficiency, phlegm, fire, wind and blood stasis. The pathogenesis of TCM is shown in Figure 3.The five factors can cause disease alone or intermingle with each other. In the process of clinical syndrome differentiation and treatment, the primary and secondary should be distinguished.

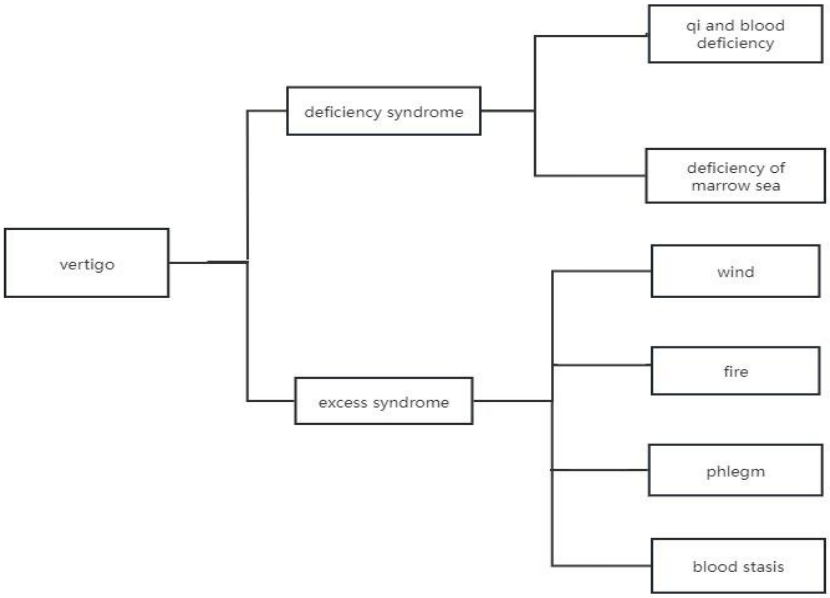

Figure 3: The pathogenesis of TCM

3.2 Contemporary Chinese Medicine Scholars' understanding of RD

On the basis of summarizing the experience of our predecessors, contemporary doctors have some new understanding and opinions on the etiology and pathogenesis of vertigo. Liu Wei [18] treats vertigo according to the theory of "blood turbidity". He thinks that if the blood is harmonious and full of blood, he is full of spirit and clear consciousness, while the loss of glory and confusion of blood lead to distraction and dizziness. Therefore, the method of resolving turbidity and promoting blood circulation should be used to treat vertigo. Ma Xiaoyi et al. [19] think that modern people like to eat fat, sweet and greasy, and their living habits are sedentary and inactive. The formation of phlegm-dampness constitution and qi deficiency constitution can easily lead to vertigo. Professor Haiying [20] proposed that vertigo should be treated from the theory of qi. He believes that the pathogenesis of vertigo lies in the disorder of qi, blood, yin and yang, while the key to the pathogenesis lies in the abnormal rise and fall of qi. Professor Gao Jiesan [21] according to many years' experience in the treatment of vertigo, he believes that the root of vertigo lies in the liver, and it is related to spleen and kidney. Due to the imbalance of foot three yin, liver, spleen and kidney function, clear yang cannot rise and turbid yin cannot desend, so vertigo occurs. Wu Min et al. [22] according to the "Lingshu" theory, the pathogenesis of vertigo is summarized as four aspects: evil in Zang-fu organs, deficiency of marrow sea, disorder of Ying and Wei, and deficiency of upper qi.

4. Treatment of RD by Western Medicine

At present, the treatment of the disease by Western medicine mainly comes from three aspects [23]: The first aspect is to improve the inner ear circulation. The more commonly used drug in

clinic is betastine, which can increase the blood flow of the brain and the inner ear to improve the patient's vertigo and residual symptoms. At the same time, as an H1 receptor agonist, betastine plays an important role in the peripheral vestibular system, regulating sensory coding, increasing the activity of semicircular canal afferent neurons and regulating the concentration of Ca2+ in perivestibular cells, thereby reducing vestibular organ asymmetry and alleviating symptoms [24]. The second aspect is placebo and psychotropic drugs, such as antidepressants and anxiety drugs such as etizolam, lorazepam, flupentixol and melitracen. Because BPPV patients have severe vertigo and easy to relapse after postural changes, patients with residual dizziness after reduction are worried about recurrence and fall and reduce their activities, which seriously affect their daily life and produce serious psychological disorders, so antianxiety drugs are used.Some scholars have pointed out that [25] flupentixol and melitracen has a good effect on the duration, degree and mood of residual dizziness. The third aspect is vestibular rehabilitation training. Vestibular rehabilitation therapy (VRT) and Brandt-Daroff acclimatization training are commonly used training at present [26], which can improve patients' ability of coordinated control of balance and activate the ability of adaptation and compensation of central nervous system. The changes of head position and body position can promote the absorption of otolith fragments, thus improving vestibular function and residual symptoms.

5. Treatment of RD by traditional Chinese Medicine

At present, the general principle of traditional Chinese medicine in the treatment of vertigo is "tonifying deficiency and purging excess and adjusting yin and yang". People with deficiency should tonify qi and blood, nourish liver and kidney, fill essence and tonify marrow, while those who are deficient should latent yang and relieve wind, clear liver and purge fire, resolve phlegm and remove blood stasis. The main treatment methods include internal and external use of traditional Chinese medicine, internal administration of proprietary Chinese medicine, acupoint application, acupuncture and massage, and so on.

Zhang Zhongjing, a physician of the Eastern Han Dynasty, first mentioned the dizziness caused by phlegm, put forward the principle of "medicine of a warm nature" for clinical application, and created many classic prescriptions, which were widely spread in later generations. After Zhang Zhongjing, the Danxi School, headed by Zhu Danxi, gradually formed a characteristic phlegm syndrome theory on the basis of Huangdi Nei Jing and doctors of Tang and Song dynasties on the etiology, pathogenesis, treatment, diagnosis and treatment of phlegm syndrome. In the diagnosis and treatment of turbid phlegm vertigo, Zhu Danxi put forward "wet phlegm", "fire phlegm" and "phlegm with qi deficiency and fire" as its main pathogenesis. In terms of treatment principles and methods, it mainly focuses on expelling phlegm, tonifying qi and reducing fire. Representative prescriptions such as Ginseng Qianhu decoction, Baifuzi Pill, Banxia Baizhu Tianma decoction are commonly used in clinic [27]. Li Minggao [28] thinks that senile vertigo caused by turbid phlegm should be combined with the products of removing blood stasis and promoting blood circulation, and put forward the treatment principle of promoting blood circulation and promoting diuresis. Deng Tietao [29] attached great importance to the application of classical prescription in this disease, and achieved good results in the application of Zexie decoction. Zhu Lianyu [30] and others used the classic prescription Banxia Baizhu Tianma decoction to treat phlegm-damp BPPV, and found that the effective rate of the treatment group was 93.5%, which was significantly higher than that of the control group. So contemporary doctors only use traditional Chinese medicine decoction or traditional Chinese medicine decoction combined with manual reduction in the treatment of BPPV, the effect is remarkable.

6. Summary

With the improvement of the diagnosis rate of BPPV, clinical research has developed from the traditional diagnosis and treatment methods and curative effect observation to a more in-depth direction, and the study of residual symptoms after BPPV reduction has become a hot spot. Western medicine adopts symptomatic treatment, which often has poor curative effect, gastrointestinal reaction, nausea, vomiting and other side effects. Traditional Chinese medicine treatment has the advantages of less side effects and good curative effect, so it is easy to be accepted by more patients..In the clinical randomized controlled trials reported at present, the curative effect of Chinese decoction combined with western medicine in the treatment of RD is better than that of western medicine alone. It can shorten the course of residual symptoms after successful reduction of BPPV, improve the symptoms and improve the quality of life of patients. It can shorten the course of residual symptoms after successful reduction of BPPV, improve the symptoms and improve the quality of life of patients.

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