

Research Progress on Refractory Hypertension in Traditional Chinese Medicine

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Abstract: At present, the mortality rate and disability rate caused by cardiovascular and cerebrovascular diseases are very high in China. Individuals with refractory hypertension are at a greater risk of developing chronic kidney disease, heart failure, stroke and myocardial infarction. Therefore, how to effectively control blood pressure and identify the cause of refractory hypertension is a problem that medical workers need to solve, and it is also the key to prevent cardiovascular disease. In recent years, the government actively supports the development of traditional Chinese medicine. Since the curative effect of traditional Chinese medicine is recognized by the public, the prospect of traditional Chinese medicine in the prevention and treatment of refractory hypertension is considerable, and it is expected to become the main key research direction in the future.

Keywords: Refractory hypertension; Etiology; Pathogenesis; TCM treatment; Experience of famous doctors

Publication date: July 2021; **Online publication:** July 30, 2021

1. Introduction

Refractory hypertension refers to the uncontrolled and elevated blood pressure that is not up to the standard despite the improvement in life style, the use of 3 or more antihypertensive drugs (including diuretics) in sufficient, reasonably tolerable amounts for more than one month, or the use of 4 or more antihypertensive drugs for the purpose of controlling blood pressure^[1]. Studies have found that refractory hypertension is difficult to treat. Its etiology is complex, most of which is related to genetic factors, poor lifestyle and compliance, and irreversible damages to target organ.

2. Etiology and pathogenesis

2.1. Perspectives of ancient medical practitioners

There is no terminology equivalent to refractory hypertension in Chinese medicine, but according to the symptoms, signs and the corresponding complications, it can be attributed to "hepatic yang," "dizziness," "hepatic wind" and factors of other categories. According to traditional Chinese medicine (TCM), it is believed that the occurrence of refractory hypertension is mainly related to congenital endowment, diet, mood, long-term illness, etc., and the main pathogenesis revolves around the imbalance of *qi*, blood, *yin* and *yang*, deficiency of liver and kidney, and even *yang* hyperactivity. Based on *Huangdi Neijing*, "all wind with shaking and dizzy vision is ascribed to the liver," "depressed wood is treated by effusion... , and even a ringing in the ears," "reverting *yin* increases, causing tinnitus and head dazzle."

The perspective of "kidney deficiency will cause heavy body shaking, shortness of brain will cause tinnitus" and other opinions may cause huge impact to the next generation. Zhongjing Zhang further developed on this basis, taking phlegm and drinking as the indispensable causes of the disease; therefore, he developed a treatment for the disease from the angle of phlegm, and contributed a lot of classical prescriptions for the treatment of this disease. Wansu Liu, as a representative of the "Cold and Cool School"

had a deep study of the Inner Canon. He proposed the theory of “wind and fire” and emphasized the harm of “the evil of heat” to the body. He put forward the view that “both wind and fire are *yang*, and *yang* is getting more convergent; *yang* is the main movement, and *yang* is rotating when the two *yangs* fight.” Danxi Zhu’s theory is based on “phlegm” and advocates that expectoration should be the first treatment. Jiebin Zhang put forward two views: “the upper deficiency leads to dizziness” and “without deficiency, dizziness is not possible.” He proposed the treatment of replenishing deficiency based on the theory of “deficiency.” In *On the Origin and Pathology of Various Diseases*, Yuanfang Chao put forward the view that wind is pathogenic, while Zhongzi Li held that wind, fire, phlegm, deficiency, heat, and dampness were the six evil factors that caused vertigo.

2.2. Perspectives of modern medicine

The pathogenesis of refractory hypertension is complex, and Western medicine believes that it is closely related to fluid retention, vascular endothelial injury, arteriosclerosis, sympathetic nerve and renin–angiotensin–aldosterone system (RAAS) axis [2]. Different TCM schools or principles have different understandings on its etiology and pathogenesis. Qinghai Li believes that liver is the primary cause of refractory hypertension, and it is also related to heart, spleen and kidney [3]. The liver belongs to the wood, which is mainly responsible for relieving, and its nature is mainly active. The liver meridian reaches the top of the peak. Therefore, when relieving becomes abnormal, the *qi* mechanism will be in disorder, and the upper Chong and the orifices become clear. In addition, when the long-term disease enters the network vessels, the kidney essence will be damaged, the water does not nourish wood, and the liver *yang* will become hyperactive, leading to vertigo. Li Peng proposed that “turbid *qi*” (endogenous heat toxin) was the basic pathogenesis leading to refractory hypertension, so detoxification and diarrhea were established as the basic treatment method in clinical practice [4]. Xiaochen Ren thinks that turbid *yin* obstructing network vessels is an important pathogenic mechanism of the disease, and puts forward that cold evil is an important reason for the formation of turbid *yin* [5]. Therefore, in the process of treatment, unblocking and draining should be prioritized, supplemented by dispelling cold. Professor Renhuan Yu believes that the disease was closely related to the disorder of the movement of *qi*, blood and water, and the disharmony of the five visceral organs, and developed five methods to treat the disease according to syndrome differentiation [6]. In the process of clinical diagnosis and treatment, Yingdong Li found “wind, deficiency, blood stasis and phlegm” are the TCM syndrome elements of refractory hypertension; therefore, he established the basic TCM treatment methods of warming *yang*, nourishing *qi* and draining wind, clearing phlegm to remove blood stasis and nourishing water, and advocated appropriate measures according to local conditions, which have achieved good curative effect [7]. Xindong Wang emphasized adherence to the classics and believed that the incidence of intestinal welling-abscess was consistent with multiple etiologies and pathogenesis of refractory hypertension, that is, blood stasis, heat accumulation and phlegm turbidities [8].

Generally, doctors usually have their own opinions on refractory hypertension with same treatment based on syndrome differentiation of disorders of *yin* and *yang* in viscera and meridians that the disease is divided into deficiency and excess. The excess is attributed to the endogenous wind, fire, phlegm, and blood stasis while the deficiency is attributed to the deficiency of *qi* and blood, *yin* and *yang*, and *yin* essence.

3. Pattern identification as the basis for determining treatment

The main feature of TCM in the treatment of diseases is to use the theory of syndrome differentiation to treat diseases under the guidance of the overall concept. Research shows that hyperactivity of liver *yang* is the initial manifestation of refractory hypertension [9]. *Yin* deficiency and *yang* hyperactivity is the further manifestation of hyperactivity of liver *yang*. If *yin* and *yang* are damaged over time, the formation of deficiency of both *yin* and *yang* would fall into the classification of hypertension stipulated in *Guided*

Principles for Clinical Research of New Traditional Chinese Medicine, which notes four syndrome types: hyperactivity of liver fire, hyperactivity of *yin* and *yang*, deficiency of both *yin* and *yang*, and accumulation of phlegm and dampness. From his long-term clinical practice, Darui Zhong summarized the methods of stabilizing the spirit and mind, activating blood circulation to dissipate blood stasis, invigorating the spleen and promoting diuresis, resolving phlegm and dredging network vessels, soothing the liver and regulating *qi*, nourishing *yin* and suppressing *yang*, calming liver wind, and tonifying both *yin* and *yang* [9]. Research shows that the extract of *Salvia miltiorrhiza* can reduce the disposition of cholesterol in blood vessels and play a role in reducing blood pressure. Qiue Lin applied fructus evodiae in Yongquan point to rapidly reduce blood pressure and maintain a stable state of blood pressure [10]. *Salvia miltiorrhiza* and ligustrazine injection, a commonly used TCM extract, has good clinical effect on the levels of serum C-reactive protein (CRP) and homocysteine in patients with intractable hypertension. In addition to all kinds of TCM, acupuncture combined with expectoration and smooth liver prescription, and acupuncture combined with TCM to regulate main and collateral channels and viscera has achieved remarkable results. Tietao Deng's foot massage prescription can reduce the blood pressure and improve the clinical symptoms of patients with resistant hypertension. The combination of TCM and Western medicine is also one of the methods for the clinical treatment of refractory hypertension, and its efficacy has been clinically verified.

4. Summary

In summary, TCM syndrome differentiation treatment of elderly patients with refractory hypertension has significant, safe, and reliable effect in controlling blood pressure, and is acceptable by patients and worthy of clinical promotion.

Disclosure statement

The authors declare that there is no conflict of interest.

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