

# Treatment of Cough Variant Asthma from the Perspective of Qi Deficiency and Phlegm Fever

Yujia Liu<sup>1</sup>, Yaohui Li<sup>2,\*</sup>

<sup>1</sup>Shaanxi University of Chinese Medicine, Xianyang 712046, Shaanxi, China  
<sup>2</sup>Shaanxi Provincial Hospital of Chinese Medicine, Xi'an 710003, Shaanxi, China  
\*Correspondence Author

**Abstract:** Cough variant asthma (CVA) is a special type of asthma with cough as the only or main manifestation, with airway hyperresponsiveness and cough hypersensitivity [1]. Traditional Chinese medicine mostly treats “wind cough” and “wheezing”. Based on the pathogenesis theory of “Qi Disorder-Phlegm and Heat Suppressing the Lung”, this paper proposes that qi deficiency and phlegm and heat are the core pathogenesis of CVA that is prolonged and difficult to heal. The treatment of cough variant asthma in TCM follows the holistic concept and the principle of syndrome differentiation and treatment [2], and the general principle is to dispel evil and promote righteousness, and treat both the symptoms and the root causes. In the acute stage, it mainly focuses on dispelling evil spirits, while in the remission stage, it focuses on strengthening the body, and shows unique advantages by regulating the function of the viscera and improving the microenvironment of the airway.

**Keywords:** Cough variant asthma, Qi deficiency, phlegm and heat, Medical record.

## 1. Introduction to Western Medicine

Cough variant asthma is an atypical asthma with cough as the main or only symptom, accounting for about one-third of the causes of chronic cough in China, and the main clinical diagnosis of CVA is continuous and repetitive, irritating dry cough at night, often accompanied by itchy throat and dry throat, no obvious shortness of breath during the onset of the disease, and obvious airway hyperresponsiveness [3]. It has a chronic inflammatory response in the airways mediated by inflammatory cells and factors similar to that of typical asthma, so it is often considered a precursor to asthma. With the development of modern industry and environmental pollution, the incidence of CVA in China is increasing year by year, and CVA accounts for 24%~33% of chronic cough, and CVA accounts for the second place in the overall cases in Western countries, about 24%~32%, and CVA has gradually become the most important cause of chronic cough. The Atypical Asthma in China (APAC) study found that CVA had common pharyngeal symptoms and higher cough sensitivity than Classic Asthma (CA). Modern medicine recommends the use of inhaled corticosteroids in combination with bronchodilators, leukotriene receptor antagonists, or short-term oral corticosteroids for the treatment of CVA [4]. However, due to the side effects or contraindications of the drug, the patient's compliance is poor, resulting in unsatisfactory treatment effect, although most patients can be effective in a short period of time after taking the drug, but the cough and other symptoms often reappear after stopping the drug.

## 2. Research Progress in Western Medicine (Pathogenesis)

In recent years, significant progress has been made in the pathogenesis, diagnosis and treatment of CVA. In terms of pathogenesis, recent research focuses on the molecular mechanisms of airway inflammation and airway hyperresponsiveness (AHR). Patients with CVA have a Th2-type inflammatory response similar to that of typical asthma, characterized by eosinophilic infiltration and elevated

levels of cytokines such as IL-4/IL-5/IL-13 [5]. Studies have found that the levels of eosinophil cationic protein (ECP) and exhaled nitric oxide (FeNO) in the sputum of CVA patients are significantly elevated, suggesting the persistence of eosinophilic inflammation [6]. In addition, the mechanism of neurogenic inflammation has been gradually emphasized, and the abnormal activation of transient receptor potential (TRP) channels (such as TRPV1, TRPA1) in the airway sensory nerve endings may be involved in the pathogenesis of CVA by enhancing cough reflex sensitivity. In terms of diagnostic criteria optimization, the diagnosis of CVA is still based on the sensitivity of chronic cough to bronchodilator or glucocorticoid therapy, combined with airway hyperresponsiveness testing (e.g., methacholine provocation). In recent years, the combination of radiomics and biomarkers has become a research hotspot, and high-resolution CT (HRCT) can assist in the evaluation of airway remodeling. Neuropeptide levels such as SP (substance P) and NGF (nerve growth factor) in sputum or serum have been shown to correlate with cough severity. In addition, the differential expression of microRNAs (e.g., miR-155, miR-21) provides potential targets for non-invasive diagnosis [7]. In terms of treatment strategy, the first-line treatment of CVA is still based on inhaled glucocorticoids (ICS) combined with long-acting beta-2 agonists (LABAs) [8]. For refractory CVA, clinical trials of biologics (e.g., anti-IgE monoclonal antibodies, omalizumab, anti-IL-5/IL-4R monoclonal antibodies) have been shown to significantly reduce cough frequency and airway inflammation.

## 3. Tracing the Origin of TCM Diseases

The name of cough disease first appeared in the “Yellow Emperor's Neijing”. The Great Treatise on Yin and Yang should be like Su Wen: “Autumn hurts dampness, winter coughs”, and set up a special article to distinguish viscera syndrome, which can be described as the pioneering work of cough theory, and put forward the view that “all five organs and six organs make people cough” and “all gather in the stomach, about the lungs” [9], which had a profound impact on the diagnosis and treatment of cough in later generations.

Although the name “cough” does not appear in the “Treatise on Cold Damage Disorders”, cough and wheezing are frequently mentioned in the text. The “Essential Prescriptions from the Golden Cabinet” was the first to propose a treatment formula for cough, namely the Soap Pod Pill. The “Minor Treatise on Medicine” was the first to introduce the disease name “cough in children”, which specifically referred to cough in children as a separate disease. The “Treatise on the Etiology and Symptoms of Various Diseases” creatively incorporated the six meridian differentiation and etiological differentiation into the diagnosis and treatment of cough, and proposed disease names such as “Jueyin cough”, “cold cough”, and “wind cough”. In the “Clinical Acupuncture and Moxibustion - Cough”, it is stated that “cough is always due to fire, which damages the lung and causes it to be itchy, leading to coughing. Sputum is the cause of wheezing, as dampness in the spleen generates phlegm. Phlegm can be classified as cold or hot; hot phlegm mixed with fire causes itching and both coughing and wheezing occur simultaneously. Cold phlegm without fire causes itching, and wheezing stops once the phlegm is expelled. It is also said that cough does not necessarily involve phlegm; cough is caused by itching, not phlegm, while wheezing is caused by phlegm and is not necessarily silent. “ This text clearly distinguishes between cough and wheezing and defines them, but in clinical practice, cough and wheezing often occur together, so they are often referred to collectively in later generations.

#### 4. Qi Deficiency, Phlegm, and Fever Syndrome Type

Cough variant asthma is a long-term illness, prolonged and does not heal, phlegm and qi stasis, cold and phlegm hurt the yang of the spleen and kidney, phlegm and heat burn the yin of the lungs and kidneys, and the lungs and kidneys are deficient, and the intake is abnormal, and the deficiency caused by long-term illness [10]. Therefore, patients with cough variant asthma for a long time often have symptoms of lung, spleen and kidney deficiency. Lung qi deficiency, qi does not dissolve, phlegm drink is endogenous and causes lung loss, shortness of breath and wheezing. And the lung qi is deficient, lost in publicity, the guard qi can not reach the surface of the fur body, the outside of the guard is not solid, it is easy to feel the evil qi and touch the phlegm, the so-called “evil is made up, its qi will be empty”. The main qi of the lungs, the breathing, the pure qi of nature inhaled from the outside world and the essence qi of the five internal organs and six internal organs are combined into the zongqi, and the zongqi goes through the breathing path to regulate the breathing. If the body has sufficient qi and the lung qi is moist, the breathing will be smooth and the function of Xuanfa and suppression will be normal. There is a saying in the “Pulse Meridian”: “Closing the pulse is a cough”. If the lungs are deficient, the regulation of qi in the whole body will be affected, and the qi will be reversed, causing coughing. It can be seen that lung qi deficiency is the pathological basis of CVA, and lung qi deficiency should be treated comprehensively [11]. Ancient physicians believed that phlegm and heat were important pathological factors of cough, and the treatment of cough often used the method of dissolving phlegm and clearing heat, and often used warm bile decoction as the basis for treating cough. Modern doctors mostly believe that cough is related to pathological factors

such as phlegm and heat, and phlegm heat is easy to heat and accumulate dampness, heat is invisible, and it is easy to attach to tangible dampness, so the treatment method of clearing heat often dissolves dampness and phlegm [12]. Phlegm-fever cough is mostly manifested as cough with a lot of phlegm, thick and yellow sputum, chest and flank fullness, pain when coughing, shortness of breath, thirst, constipation, red urine, hot face, red tongue, yellow greasy, slippery pulse, poor spleen luck, phlegm turbidity and endogenous, which affects the cleansing function of the lungs, and the lung qi is reversed cough [13]. The main qi of the lungs, the division of breathing, is not resistant to cold and heat, and is delicate and dirty, and the long-term cough leads to the deficiency of lung qi, phlegm and long-term heat, and the heat refining liquid burns for phlegm, and the phlegm is heated or phlegm is hot for a long time, and it can also consume the lung yin, and the lung yin causes inflammation on the fire, and the liquid can be refined into phlegm, resulting in a lingering cough and prolonged cough. In the treatment of this kind of cough, it is not necessary to stop coughing at the sight of cough, and it is necessary to grasp the pathogenesis and treat it from the root.

#### 5. Medical Record

Li, female, 76 years old. Visited on March 26, 2024. Chief complaint: intermittent cough for more than 3 years. 5 years ago, there was no obvious cause of cough, itchy throat cough, even at night, shortness of breath when coughing, coughing violently, obvious symptoms after cold air, occasional cough of yellow phlegm, phlegm sticky and difficult, dry mouth and thirst, occasional chest and flank swelling and pain, plain fatigue, sweating more, poor appetite, poor sleep, occasional constipation, yellow urine. The tongue is red and yellow, and the veins are slippery. TCM diagnosis: cough disease (qi deficiency, phlegm and heat syndrome); Western medicine diagnosis: cough variant asthma. Treatment: Nourish qi and relieve cough, clear away heat and dissolve phlegm. Prescription: Ephedra 6g, Mulberry White Peel 15g, Skullcap 20g, Melon Seed 15g, Fried Gardenia 10g, Platycodon 15g, Radix Radix 30g, Radix Ophiopogon 15g, Vinegar Herb 10g, Frcilitary Fritillary 10g, Fried Atractylodes Macrocephalus 15g, Fried Malt 30g, Glycyrrhiza Glabra 15g, a total of 7 servings. On April 5, 2024, he reported a significant decrease in the frequency of cough, a decrease in sputum production, shortness of breath and wheezing that worsened after exertion, occasional dry mouth, good appetite, better sleep than before, and two stool adjustments. The tongue is pale red and thinly yellow, and the veins are slippery. On the basis of the initial prescription, 8 g of *Prunella vulgaris*, 15 g of reed root, and 30g of *astragalus* were added. Advise the patient to avoid the cold, be emotional, and exercise appropriately. Note: This case is an elderly woman, the course of the disease is long, the lung qi deficiency has been ill for a long time, the Xuansu is abnormal, and the qi is reversed, so there is repeated coughing, qi deficiency and weakness to promote blood flow, and the blood can not moisten the throat, so the throat is itchy. Qi deficiency leads to yang deficiency, yin qi is flourishing at night, yin and yang are out of contact, so it is difficult to fall asleep. Qi and yang are deficient, the guard is not full, and the whole body cannot be warmed, so there is chills and sweating more. Long-term cough affects daily life, the liver qi is uncomfortable, the mood is not smooth, the qi is stagnant, so the liver qi destroys the stomach, so the diet is poor, the

phlegm and heat are strong, the heat is evil, so there is occasional constipation. Combined with the tongue coating and vein, the syndrome was differentiated as qi deficiency and phlegm heat, and the formula was added or subtracted by the four gentlemen's decoction and Qingjin phlegm decoction. Fangzhong skullcap and mountain gardenia clear heat and extinguish fire; Mulberry white bark and wheat winter clear lung heat, moisten the lungs and relieve cough; Fritillary, melon kernel dissolves phlegm and relieves cough, regulates qi and widens the chest; Platycodon promotes lung cough and carries medicine upward; ephedra cough and asthma; Prince's ginseng tonifies qi and relieves asthma; Incense is attached to the qi and soothes the liver; fried atractylodes and fried malt take care of the spleen and stomach; Licorice blends medicines [14]. The whole formula works together to invigorate qi and relieve cough, clear away heat and dissolve phlegm, and treat the virtual and the real together.

## 6. Brief Summary

Within, when encountered, the inside and outside are combined, and the lungs are coughed upside down. The disease is based on the false standard. Doctors need to control symptoms in a timely manner, protect the patient's lung function, improve the patient's quality of life, and treat the symptoms and phlegm fever from the clinical symptoms, and do not forget to correct the deficiency when seeing the symptoms, pay equal attention to dispelling evil and promoting the right, and treat both the symptoms and the root causes to improve the clinical efficacy [10]. Although the symptoms can be improved rapidly in the short term, there are still shortcomings such as easy recurrence after discontinuation of the drug and it is difficult for patients to adhere to the drug for a long time [15]. Under the guidance of the holistic concept of TCM and the treatment of syndrome differentiation, TCM treatment of cough variant asthma has the advantages of improving long-term prognosis, alleviating clinical symptoms, reducing drug toxicity and side effects and disease recurrence rate.

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