

Clinical experience of Shegan Mahuang decoction in treating cough variant asthma in children

Xifeng Yin^{1, a}, *Yang Liu*^{1, b}, *Guangsheng Shen*^{1, c, *}

¹Nanyang Traditional Chinese Medicine Hospital, 939 Qiyi Road, Nanyang, Henan Province, 473007, China

a. 954021769@qq.com, b. 17622852307@163.com, c. nj08shuo5@163.com

* Corresponding author

Abstract. Cough variant asthma (CVA) in children primarily involves the lungs but is closely related to the heart, liver, spleen, and kidneys. The pathological factors are mainly wind, cold, and phlegm, with the fundamental pathogenesis characterized by yang deficiency. Persistent cold, hardened phlegm, and internal stagnation are often the underlying conditions. Clinically, the disease commonly presents as cold-fluid stagnation in the lungs, phlegm obstruction due to yang deficiency, and stubborn phlegm retention in the lungs. The primary treatment approach is using Shegan Mahuang Decoction to warm yang and dissolve retained fluid. A case study is attached as supporting evidence.

Keywords: cough variant asthma, children, clinical experience

Cough variant asthma (CVA) is defined as persistent cough lasting more than four weeks, typically occurring or worsening at night and/or early morning. It predominantly presents as dry cough without signs of infection or with no response to prolonged antibiotic treatment, but with effective therapeutic responses to anti-asthmatic drugs after excluding other causes of chronic cough [1]. In recent years, the incidence of CVA in children has shown an upward trend, making it one of the common causes of chronic cough in children in China. In traditional Chinese medicine (TCM), CVA falls under the categories of "prolonged cough" and "spasmodic cough." TCM treatment has been proven effective, offering favorable prognoses without adverse effects. Guangsheng Shen has over 20 years of clinical experience in pediatric TCM and has achieved remarkable outcomes in treating CVA in children. Through my apprenticeship with Professor Shen, I have gained valuable insights into his methods. This paper summarizes Professor Shen's clinical experience in treating pediatric CVA.

1. Etiology and pathogenesis

Professor Guangsheng Shen believes that the etiology of cough variant asthma (CVA) in children involves wind, cold, and phlegm as external factors, while the fundamental cause lies in yang deficiency.

1.1. Wind

Professor Guangsheng Shen believes that the clinical symptoms of cough variant asthma (CVA) in children align with the characteristics of external wind. Wind pathogens invade the body through the mouth, nose, and skin, disrupting lung function and causing cough. As the primary exogenous pathogenic factor, wind is prevalent throughout the year, especially in spring. Wind is dynamic, unpredictable, and constantly changing, [2] mirroring the recurrent and multifactorial nature of CVA. Clinically, CVA manifests primarily as dry cough, often accompanied by throat irritation or a history of skin conditions such as urticaria or eczema, consistent with the wind pathogen's characteristic "excess wind leads to itching." Prolonged coughing may result in symptoms like breathlessness and chest tightness, echoing the wind pathogen's feature of "excess wind leads to spasms." Therefore, Professor Shen emphasizes that wind pathogens play a critical role in the onset, progression, and transformation of this disease.

1.2. Cold

Children are constitutionally characterized by immature yin and yang. Cold pathogens can directly invade from external sources or result from the consumption of cold foods, damaging yang energy and generating internal cold. Cold pathogens obstruct yang

energy, leading to water retention and phlegm accumulation in the lungs. When wind pathogens interact with phlegm in the airways, they trigger coughing. During CVA episodes, the severe spasmodic nature of the cough reflects the cold pathogen's characteristic "cold causes constriction." Chronic cold is an intrinsic pathogenic factor; its affinity for similar energy makes CVA symptoms worse at night and early morning. Chao Yuanfang of the Sui Dynasty wrote in *The Origin and Symptoms of Various Diseases*: "When the lungs are affected by cold... chronic coughing ensues, lingering for years without recovery."

1.3. Phlegm

The lungs govern water metabolism and regulate water pathways, while the spleen controls fluid distribution, and the kidneys govern water. Disturbances in these three organs disrupt fluid metabolism, leading to phlegm formation. If the lung's ability to regulate water pathways is hindered, the spleen's function to transport fluids is impaired, and the kidney's steaming and transformation function is suppressed, phlegm stagnates and accumulates in the lungs. Children, due to their congenital deficiencies, are more prone to this condition when external pathogens deplete their vital energy. Prolonged depletion of lung qi and spleen qi results in internal phlegm that fails to dissipate, forming persistent and stubborn phlegm.

1.4. Yang deficiency

The viscera in children are delicate, and their yang energy is inherently insufficient, particularly in the lungs, spleen, and kidneys. Chronic illness combined with external pathogenic invasion leads to a state of deficiency in upright energy and excess in pathogenic factors. This exacerbates the deficiency of yang energy and impairs the functions of the three organs, resulting in impaired lung dispersal and descent, weakened spleen transportation, and deficient kidney warming. This disruption in water metabolism leads to internal phlegm and cold, blocking the airways and causing disease. Thus, yang deficiency is identified as the root cause of persistent, recurrent, and chronic coughing in children.

2. Treatment

Based on Professor Guangsheng Shen's understanding of the pathogenesis of this disease, he adheres to the principles stated in *Plain Questions: Discourse on the Correspondence of Yin and Yang* that "deficiency in form should be warmed with qi" and *The Essentials of the Golden Cabinet: Syndromes and Treatments of Phlegm, Retained Fluid, and Cough* that "patients with phlegm and retained fluid should be treated with warming medicine for harmony." Professor Shen asserts that the disease's nature is yin, so the treatment should involve warming. Thus, regardless of the syndrome type, warming yang and resolving retained fluids should be incorporated into the treatment, utilizing formulae like *Shegan Mahuang Decoction* and *Mahuang Fuzi Xixin Decoction* to facilitate lung qi dispersal and eliminate retained cold and phlegm. These formulas are composed of warming herbs with sweet or pungent flavors, such as *Astragalus* (Huangqi), *Ephedra* (Mahuang), *Cinnamon Twig* (Guizhi), *Prepared Aconite* (Fuzi), *Cinnamon Bark* (Rougui), *Licorice* (Gancao), and *Asarum* (Xixin). Professor Shen classifies CVA into three main syndrome types and treats them accordingly.

2.1. Cold-fluid stagnation in the lungs

Clinical Manifestations:

Dry cough or scanty phlegm, worsened in the morning, at night, or upon exposure to cold air; white, thin phlegm; nasal congestion with clear discharge; aversion to cold; cold limbs; throat itching; pale-red tongue with white coating; tight or slippery pulse; pale-red finger veins.

Treatment Principle:

Warm the lungs, resolve phlegm, disperse the lungs, and stop coughing. The modified *Mahuang Fuzi Xixin Decoction* is commonly used.

Formula Components:

Honey-prepared Ephedra (Mahuang): Pungent and warm, enters the lung and bladder meridians, disperses wind-cold, opens pores, unblocks channels, and regulates lung qi to facilitate water metabolism (sovereign herb).

Prepared Aconite (Fuzi): Strongly warming, mobilizes yang energy, expels cold pathogens, and strengthens spleen yang to eliminate cold (minister herb).

Asarum (Xixin): Targets the lung and kidney meridians, dispels wind-cold, and warms the kidney's true yang energy (assistant herb).

Belamcanda (Shegan): Resolves phlegm and soothes the throat (assistant herb).

The warming properties of the formula dissipate cold and phlegm, facilitating lung warmth and phlegm resolution, with the combined herbs ensuring effective relief of symptoms.

2.2. Yang deficiency with phlegm obstruction

Clinical Manifestations:

Obesity, pale complexion, cough, audible phlegm in the throat, severe cases with open-mouthed breathing, elevated shoulders, inability to lie flat; pale, swollen tongue with white slippery coating; thin, weak pulse; pale-red finger veins.

Treatment Principle:

Warm the kidneys, support yang, resolve phlegm, and stop coughing. Shegan Mahuang Decoction is commonly used.

Formula Components:

Ephedra (Mahuang): Warms and disperses the lungs, resolves phlegm and cold, stops coughing, and smoothens qi movement (sovereign herb).

Belamcanda (Shegan): Clears phlegm, soothes the throat, and descends rebellious qi to alleviate obstruction (sovereign herb).

Asarum (Xixin): Warms and disperses lung qi to resolve phlegm (minister herb).

Coltsfoot Flower (Kuan Donghua) and Aster (Ziyuan): Work together to descend lung qi, resolve phlegm, and stop coughing (minister herbs).

Pinellia (Banxia) and Fresh Ginger (Shengjiang): Transform phlegm, dry dampness, and relieve chest discomfort (assistant herbs).

Schisandra (Wuweizi): Constricts lung qi to maintain orderly dispersal and descending functions, preventing overuse of dispersing herbs (assistant herb).

Jujube (Dazao): Nourishes lung qi and strengthens the middle qi (envoy herb).

The combination warms yang internally, dispels cold externally, and resolves phlegm, ensuring an effective and balanced treatment.

2.3. Stubborn phlegm retention in the lungs

Clinical Manifestations:

Dry cough or cough with phlegm, worsened in the morning, at night, after exercise, or upon exposure to cold air; yellow, sticky phlegm that is difficult to expectorate; nasal discharge; throat itching; thirst; constipation; red tongue with thin yellow or yellow coating; rapid or slippery pulse; red finger veins.

Treatment Principle:

Clear the lungs, resolve phlegm, descend rebellious qi, and stop coughing. The Empirical Formula for Cough and Phlegm Resolution is commonly used with modifications.

Formula Components:

Inula Flower (Xuanfuhua): Resolves phlegm, descends qi, and guides phlegm and retained fluids to the bladder for excretion (sovereign herb).

Honey-prepared Ephedra (Mahuang), Bitter Apricot Seed (Kuxingren), and Pinellia (Qingbanxia): Resolve phlegm and stop coughing (minister herbs).

Arisaema (Dannanxing) and Belamcanda (Shegan): Clear heat, resolve phlegm, and soothe the throat (assistant herbs).

Peucedanum (Qianhu): Disperses wind-heat, resolves phlegm, and stops coughing (assistant herb).

Licorice (Gancao): Harmonizes the formula and supports lung qi (envoy herb).

The formula combines warming and clearing actions to resolve phlegm and clear heat, achieving effective treatment of stubborn phlegm retention.

3. Case study example

Patient Information:

Name: Wang, Male, 5 years and 8 months old.

Initial Visit: July 3, 2023.

Chief Complaint: Recurrent cough for over three months, aggravated with nasal discharge for two days.

Medical History:

Three months prior, the child developed a cough without obvious triggers, predominantly worsening in the morning and at night. The cough was accompanied by scanty phlegm, without nasal discharge or fever. The child was intermittently treated with “Cefixime Granules” and “Pediatric Pulmonary Heat and Asthma Granules” for over a month, but with poor results, prompting parents to discontinue medication. Two days before visiting Professor Shen, the child's cough worsened, becoming paroxysmal with phlegm sounds in the throat, nasal congestion, and discharge. Local clinic treatment with “Antiviral Granules” and “Cefixime Granules” for three days showed no significant improvement, leading the parents to consult Professor Shen.

Symptoms on Examination:

Paroxysmal cough, aggravated at night and in the morning, accompanied by throat phlegm sounds, nasal discharge, nasal congestion, poor appetite, restless sleep, dry stools, normal urination. Physical examination revealed a pale and swollen tongue

with a white coating, a thin pulse, and pale-red finger veins. Auscultation detected slightly coarse lung sounds without wheezing or rales.

Medical History:

Prone to urticaria.

Western Medicine Diagnosis: Cough variant asthma (CVA).

Traditional Chinese Medicine Diagnosis: Prolonged cough (Yang deficiency with phlegm obstruction).

Treatment Plan:

Based on the diagnosis, the treatment aimed to warm the kidneys, support yang, resolve phlegm, and stop coughing. A modified Mahuang Fuzi Xixin Decoction was prescribed:

Ephedra (Mahuang): 5 g

Asarum (Xixin): 5 g

Belamcanda (Shegan): 8 g

Bitter Apricot Seed (Kuxingren): 8 g

Pinellia (Qingbanxia): 6 g

Schisandra (Wuweizi): 8 g

Magnolia Flower (Xinyi): 8 g

Licorice (Gancao): 3 g

Dosage: One decoction daily, divided into two doses taken warm in the morning and evening.

Follow-Up Visit (July 7, 2023):

The child's coughing and phlegm symptoms had significantly improved. Occasional coughing occurred in the morning and after exercise, but there was no nasal congestion or discharge. Nighttime coughing had ceased, and appetite and sleep improved. Stools and urination were normal. Physical examination showed a pale-red tongue with a white coating and a thin pulse.

Adjustments to the Formula:

Removed: Asarum (Xixin)

Added:

Charred Malt (Jiaomaiya): 12 g

Charred Hawthorn Fruit (Jiaoshan Zha): 8 g

Dandelion (Pugongying): 12 g

The revised formula was given for three more days.

Outcome and Long-Term Follow-Up:

Three months later, follow-up revealed no recurrence of the child's cough.

Analysis:

The prolonged course of illness, combined with the use of cold medications at external clinics, led to yang deficiency in the lungs, spleen, and kidneys. The lung's qi deficiency and inability to defend against external wind-cold caused obstruction and impaired dispersing and descending functions, resulting in coughing. As the lungs govern the nose, their dysfunction led to symptoms like nasal discharge. Spleen yang deficiency hindered fluid transformation, resulting in phlegm accumulation. Kidney yang deficiency caused loss of the true yuan, forming stubborn phlegm and residual cold, which exacerbated upon exposure to cold.

Professor Shen diagnosed the syndrome as yang deficiency with phlegm obstruction. The formula used Ephedra (Mahuang) to resolve cold and phlegm, stop coughing, and relieve asthma; Belamcanda (Shegan) to descend rebellious qi and resolve phlegm; and Asarum (Xixin) to expel wind-cold. Pinellia, Bitter Apricot Seed, and Magnolia Flower were added to transform phlegm and open nasal passages. Licorice harmonized the formula.

By the second visit, cold symptoms had mostly subsided, prompting the removal of Asarum to prevent excessive warming. Dandelion was added to clear residual heat and prevent internal transformation of cold into heat, reflecting the principle of disease prevention. Charred Malt and Charred Hawthorn Fruit were added to improve appetite by supporting the spleen. Subsequent treatment focused on root-strengthening, emphasizing kidney warming, spleen strengthening, and lung tonification to resolve the condition fully.

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References

- [1] Wang, W. (2013). *Pediatrics* (8th ed.). People's Medical Publishing House.
- [2] Zheng, H. (2021). *Fundamentals of Traditional Chinese Medicine*. China Traditional Chinese Medicine Press.