

# Research Progress in the Treatment of Bronchiectasis by Traditional Chinese Medicine

Tong Zhao<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:** *The incidence of bronchiectasis is associated with infection, immunodeficiency, heredity and so on. Because of its persistent and irreversible expansion, it often recurs and persists, which seriously affects the quality of life of patients. Modern medical treatment focuses on the control of acute exacerbation of infection, but it is still unable to cure it. In recent years, the research on the prevention and treatment of bronchiectasis by traditional Chinese medicine has gradually increased, and some studies have found that traditional Chinese medicine has certain advantages and characteristics in controlling infection in the acute phase, prolonging the stable phase, reducing the number of recurrences and acute exacerbations, and improving immunity. This article systematically summarizes the understanding of the pathogenesis and treatment ideas of bronchiectasis by doctors in the past five years, and provides reference for clinical treatment of this disease.*

**Keywords:** Bronchiectasis, Physician experience, Pathogenesis, Treatment.

## 1. Introduction

Bronchiectasis is a chronic airway disease caused by recurrent purulent infections caused by various causes, causing bronchial abnormalities and persistent dilatation. Because of its irreversible expansion, it often recurs and persists, seriously affecting the quality of life and physical and mental health of patients. Its prevalence ranks third in chronic airway disease [1]. However, the current clinical attention and research heat for bronchiectasis are much lower than chronic obstructive pulmonary disease and bronchial asthma [2]. At present, the clinical treatment focuses on the control of acute exacerbation of infection. Airway clearance, expectorant anti-infection and surgical treatment are still unable to cure it [3]. Bronchiectasis belongs to the category of 'lung carbuncle' in traditional Chinese medicine. It is caused by heat injuring lung qi, steaming liquid into phlegm, excessive heat and blood stasis, heat toxin and blood stasis in the lung, resulting in lung lobe sores and blood corruption. Clinically, cough, purulent sputum and hemoptysis are the main manifestations. The pathogenesis is mostly deficiency in origin and excess in superficiality, based on deficiency of lung, spleen and kidney, with phlegm-heat and blood stasis as the standard. Traditional Chinese medicine has unique advantages in the treatment of this disease, especially in controlling infection in the acute phase, prolonging the stable period, reducing the number of recurrences and acute exacerbations, and improving immunity. In recent years, various doctors have their own views on its treatment. Now, the academic thoughts and experience characteristics of each of them are summarized as follows.

## 2. Pulmonary Pyocutaneous Disease Theory

Based on the theory of 'pyocutaneous disease' in traditional Chinese medicine surgery, Xu Jianxing[4] and others believe that 'lung qi deficiency, phlegm-heat accumulation, internal and external evils' are the potential causes of the occurrence and development of bronchiectasis. The pathogenesis of acute exacerbation of bronchiectasis is 'heat entering the nutrient blood, phlegm and blood stasis, causing purulent erosion of the lung', and the pathogenesis of stable bronchiectasis is

spleen and stomach weakness, evil in the lung collaterals, positive deficiency and evil love'. It is advocated that in the early stage of the disease, the 'elimination method' should be used to relieve the exterior, reduce phlegm and clear heat, reverse the state of cutting off phlegm-heat obstructing lung, and be good at using wind drugs such as bupleurum and cimicifuga [5]. It not only takes the meaning of wind drugs into the lung meridian, but also mediates the regulation of the cardinal, raises the yang qi, the waterway is smooth, and the sputum is eliminated. On this basis, the compatibility of Qianjin Weijing Decoction of reed root, coix seed, wax gourd seed, peach seed to phlegm clearing lung, In the acute exacerbation period, phlegm becomes pus, and phlegm, heat and blood stasis are intermingled. When 'Xiao' and 'Tuo' are used together, the methods of clearing heat and detoxifying, dredging collaterals and removing evil, and removing pus are mostly based on the addition and subtraction of Tounong Powder combined with Tuoli Qingzhong Decoction. The prescription is based on the large dose of Huangqi and Zaoci Guxie Tuodu. Supplemented by Dangshen, Danggui Yiqi Fuzheng, in the stable period, it should be mainly based on tonifying, invigorating spleen and tonifying lung, replenishing qi and nourishing yin, and regulating yin and yang. Therefore, Lizhong Decoction should be used to warm yang, replenish qi and invigorate spleen, Pinelliae Rhizoma and Citri Reticulatae Pericarpium should be used to dry dampness and resolve phlegm, promote qi and transport spleen, and tonify without stagnation. Asarum and Schisandrae Chinensis Fructus should be used to warm lung and resolve phlegm, replenish qi and generate fluid, and combine collection and dispersion, so as to be suitable for lung to disperse and descend, and can be combined with Astragalus membranaceus, Poria cocos, Dioscoreae Rhizoma and other spleen-transporting products.

## 3. Hidden Pathogen Theory

Miao Qing, Ao Suhua, Wang Zherui [6,7] and others believe that the pathogenesis of bronchiectasis is deficiency in origin and excess in superficiality, deficiency in lung, spleen and kidney, and excess in latent evil. The two are reciprocal

causation and run through the occurrence and development of the disease. Bronchiectasis patients are often in a state of low airway immune defense function, lung qi deficiency, unable to support the evil to go out, creating internal conditions for the hidden and long-term stagnation of hidden evil. The evil qi is deep in the interior, or damages the lung collaterals, causing the lung qi to descend abnormally. It may block the distribution of qi, blood and body fluid, resulting in the production of new pathological products, or long-term depression and fire, resulting in the combination of qi and fire, consumption of qi and injury of yin, further aggravation of deficiency of vital qi, hidden in the interior, consumption of vital qi, yin and body fluid, excessive deficiency of fire and further consumption of vital qi. The two are the cause and effect of each other, which runs through the occurrence and development of bronchiectasis. Phlegm heat and blood stasis runs through the whole course of bronchiectasis. Fuxie long, stable period although no obvious symptoms, but the positive and evil continued to fight, lung, spleen and kidney three dirty gas are insufficient, can not change the health gas, protect the muscle surface, the health table is not solid, more likely to cause the outside world six evil gas invasion, easy to become a stubborn disease [8]. Therefore, the clinical diagnosis and treatment of recurrent bronchiectasis should follow the idea of 'prevention before disease onset, prevention of disease progression'. Starting from its stable period, we should help the healthy qi to clear and penetrate the latent evil at the same time, and help the healthy qi to eliminate the latent evil on the basis of 'strengthening the root and consolidating the root'. Lung and kidney yin deficiency, given Baihe Gujin Decoction, Liuwei Dihuang Decoction, the movement is wheezing and shortness of breath, and the syndrome is lung and kidney qi deficiency. When Pingchuan Guben Decoction is used to reduce qi and phlegm in the kidney, patients with spleen and kidney yang deficiency were given Fuzi Lizhong Pill, Sini Decoction, Yanghe Decoction, for those with phlegm turbidity in the interior, drugs for clearing phlegm and removing blood stasis should be added. If cold phlegm is in the interior, Xiaoqinglong Decoction or Cangma Pill can be used to dispel the cold phlegm in the interior. For stubborn phlegm, you can use rolling phlegm pill [9], control saliva Dan to open the cementation of phlegm, if phlegm heat consumes body fluid, Qinghao Biejia Decoction is used to clear yin and divide latent heat.

#### 4. In the Blood can Still be Promoting Qi Circulation by Relieving Yingfen

Zhang Zhimin [10] believes that bronchiectasis is a large hemoptysis developed from infection, which is similar to the sequential transmission of Wei, Qi, Ying and blood from the outside to the inside. Exogenous warm and heat disease evils first enter the Weifen, evils from the outside to the inside, and then evils enter the Qifen. If the disease is not understood, it gradually wants to enter the camp, the camp is heated, the blood is robbed, and the evil heat forces the blood to be delusional. Therefore, the acute infection of bronchiectasis is from blood in sputum to vomiting a large amount of fresh blood, Hemoptysis dry bronchiectasis with recurrent hemoptysis as the only symptom is similar to the pathogenesis of latent pathogen. Repeated infection due to various reasons leads to irreversible damage to the bronchial wall, local formation of chronic inflammation, repeated infection, and

further tracheal injury [11], that is, 'vicious circle' [12]. When the body's immunity decreases, reinfection, under the action of inflammatory stimulation, vascular rupture, or increased vascular permeability, resulting in hemoptysis. Bronchiectasis patients with lung depression, depression and fire. Bronchiectasis hemoptysis by Wei Qi Ying blood transmission to the blood in stages, in the treatment of 'in the blood can still be through the heat to the gas', but in fact to the evil way out, so that the heat, hidden evil smooth turn bleeding solution. First to cure gas, gas light Yang, the use of forsythia, mulberry leaves, lotus leaves, chrysanthemum, gypsum and other drugs, the purpose of the above coke should be reduced Yitong, The hemoptysis of liver and lung disharmony, due to the obstruction of the middle energizer, the liver has risen and the lung has not fallen, resulting in the spillover of blood from Yang collateral injury, and the use of mulberry leaves, uncaria, curcuma, dalbergia, peach kernel and so on to restore Qi machine, secondary treatment of hidden evil, evil and heat accumulation in the blood, when the heat is to be used, Coptis, rhubarb, Pulsatilla and other substances, such drugs in addition to clearing heat and toxin, but also into the blood to remove heat and toxin [13]. Therefore, Zhang Zhimin's self-made Lifei Qingchang Decoction Qingyu Fire makes the upper coke lung heat comfortable, the middle coke air machine recovers, and the lower coke makes the evil have a way out. The upper and lower Jiao are treated at the same time, and the two orifices are opened at the same time, taking into account the lung, clearing the intestine, and giving the blood to divide the evil gas to get out. In this way, the camp is hot enough to breathe out of the table, so as to 'still breathe through heat in the blood', but in fact, it gives the evil a way out.

#### 5. The Theory of Blood and Fluid is the Same Disease

Phlegm and blood stasis are important pathological products in the course of bronchiectasis. Phlegm is caused by the unfavorable accumulation of water, and blood stasis is caused by the stagnation of blood in the normal way, both of which are the pathological changes of blood water. Phlegm and blood stasis are both raw, mutual obstruction, poor qi movement, phlegm and blood stasis, phlegm turbidity and heat evil cementation [14], available Zhejiang fritillaria, trichosanthis, bamboo shavings, platycodon grandiflorum heat phlegm products, Qi and blood to pass for use, when paying attention to regulating qi and blood, 'essence and blood homology' often with ink dry lotus, cooked rehmannia nourishing kidney essence to Rong Yang liver blood. Blood stasis to blood Rong, the blood flow is smooth. Removing blood stasis to smooth qi, regulating qi to harmonize blood [15]. Blood stasis, treatment available Chuanxiong, Rhizoma Corydalis, safflower, peach kernel, turmeric blood circulation, Chuanxiong, Rhizoma Corydalis and qi work, if the course of the disease is long and the blood stasis is obvious, the blood-breaking drugs of Curcuma Rhizoma, Sparganii Rhizoma or Leech and Tabanus can be used as appropriate. The normal operation of blood and water is based on the regulation of qi movement. Therefore, the treatment of bronchiectasis should also regulate the qi movement. According to the clinical situation of the patients, the flavor of tangerine peel, xiangfu and chuanlianzi should be added. Evil heat steaming, loss of body fluid, the accumulation of phlegm

turbidity in the body hinders the normal distribution of water and fluid, and also hinders the formation of body fluid. Therefore, the syndrome of yin fluid loss is more common in the later stage of the patient. The treatment should nourish yin fluid, which can be nourished by Radix Glehniae, Radix Ophiopogonis, Dendrobium officinale and Lily, and can be slightly added with Angelicae Sinensis Radix, Radix Rehmanniae Preparata, Radix Paeoniae Alba, Colla Corii Asini and other blood supplements.

## 6. The Theory of Treating Lung is Not Far from Warm

Professor Hong Guangxiang [16] believes that the basic pathogenesis of bronchiectasis is deficiency in origin and excess in superficiality, and phlegm, blood stasis and heat are excess in superficiality. The essence of the pathogenesis lies in the deficiency of lung and spleen qi, and the deficiency of both qi and yang is involved for a long time. Based on the theory of treating lung not far from temperature, it is believed that the treatment of bronchiectasis should be based on 'Wenyang Xuanton' [17]. Professor Hong Guangxiang believes that qi-yang deficiency is the main internal cause of chronic lung diseases, and exogenous wind-cold is the most common cause of recurrent chronic lung diseases. The patient's condition of bronchiectasis is prolonged and recurrent, resulting in weak qi and yang, and the defense is not solid. When the lung is warmed and the lung is cold, the lung is ventilated and the cough is stopped, Professor Hong Guangxiang believes that the essence of phlegm in patients with bronchiectasis is wet phlegm [18]. For phlegm-dampness and yin-evil, it is proposed to follow Zhang Zhongjing's principle of treating phlegm: patients with phlegm should be treated with warm medicine, and Lingui Zhugan Decoction should be used to warm phlegm, phlegm and blood stasis is the main pathological product of bronchiectasis [19]. There are three causes of blood stasis, one of which is the internal resistance of blood stasis caused by the unfavorable qi movement, second, the phlegm in the lung causes blood stasis, three is Yang deficiency Yin Sheng caused by blood stasis [16], the blood is warm, the cold is coagulation, phlegm and blood stasis Yin evil, non-warm, the prescription should be warm and not cool, so the clinical dialectical should be warm medicine and blood stasis medicine, Professor Hong Guangxiang believes that the disease is mainly based on the deficiency of lung and spleen qi in the remission period. When the spleen and stomach are warmly nourished, the Zongqi is replenished, and the 'source of phlegm' is eliminated. Buzhong Yiqi Decoction is selected to benefit the spleen and stomach, and to help the lung qi. On the basis of tonifying the Zongqi, it can effectively alleviate the occurrence of qi deficiency and yang.

## 7. The Theory of Asthenia of Healthy Energy and Accumulated Loss

Zhang Jinzhi et al. [20] believed that 'deficiency of healthy qi' is the pathogenesis of the occurrence and development of bronchiectasis. Deficiency of primordial qi and dysfunction of lung and spleen are the initial pathogenesis. At the same time, the accumulation of pathogenic factors, phlegm turbidity, yin fire, blood stasis and other pathological products accumulate

in the lung as the central link of the disease. Clinically, we should follow the principle of 'eliminating evil and eliminating accumulation, strengthening the body and restoring damage'. Lung is valuable for dredging, and dredging is for use. However, obstruction is carbuncle, and only dredging can remove obstruction. Therefore, the elimination of evil should be used for the use of the method, phlegm and dampness obstructing the lung to Erchen Decoction, Wendan Decoction, Yitu Yuju, the heat closed the lung, choose Maxing Shigan Decoction, Yuebi plus Banxia Decoction, Yijin Yuxiezhi, hot and humid diffuse, with Qianjin Weijing Decoction, Lingui Zhugan Decoction, Yishui Yuzhe, Yang depression does not extend, with Shengyang Sanhuo Decoction, Shengyang Yiwei Decoction, meaning fire depression, the liver qi invading the lung, with Xiaoyao Powder, Chaihu Shugan Powder addition and subtraction, Yimu Yudazhi, reinforcing the body resistance focuses on strengthening the earth to generate gold or worshiping the earth to make water to generate gold. When it is intended to use Bupi Qingfei Decoction, Qingbu Weijing Decoction to invigorate the spleen and benefit the lung, clear heat and reduce phlegm and turbidity [21].

## 8. The Theory of Five Zang-organs Homology

Gong Xiaoyan proposed lung, spleen and kidney qi deficiency as the root of recurrent bronchiectasis [22]. Lung, spleen and kidney are also important hubs for the operation and distribution of body fluid. Three zang-organs are deficient, water and body fluid are not distributed, and phlegm pathogen is endogenous. Therefore, qi deficiency is the basis of bronchiectasis, and phlegm turbidity is serious. However, qi deficiency and phlegm obstruction further lead to accumulation of blood and accumulation in the body [23]. The treatment should be based on strengthening the body resistance and eliminating the evil, distinguishing the primary and secondary, benefiting the lung, strengthening the spleen and tonifying the kidney, paying attention to the healthy qi, treating the qi first, and the phlegm is also caused by the qi disease. Treating the qi is the cure, and the qi is rich [24]. Chen Lijuan et al. [25] believed that the occurrence of bronchiectasis was closely related to the disorder of the five zang-organs based on the theory of "five zang-organs are in harmony." The pathogenesis of bronchiectasis is based on the deficiency of lung and spleen, and phlegm-heat and blood stasis cementation. Lung and spleen are the key to the disease, and are closely related to the liver, heart and kidney. Phlegm and blood stasis are pathological products and run through the whole course of the disease. When clearing heat is the first, strengthening the body in the middle, adjusting the three internal organs at the end, and removing phlegm and toxins are taken into account in the whole course [26]. Zhang Zhongde [27] insisted on 'treating cough not far from the lung' and 'treating cough not specializing in the lung', emphasizing that the five zang-organs are balanced and the five zang-organs are strong, so that the evil is not invaded, so as to achieve 'prevention before disease, prevention of disease progression, and prevention of aging.'

## 9. Summary

Bronchiectasis is often recurrent and protracted, and Western medicine is still unable to cure it. Bronchiectasis belongs to

lung carbuncle' in traditional Chinese medicine. It is one of the dominant diseases of traditional Chinese medicine. Ancient doctors have accumulated rich theoretical knowledge and clinical experience in its diagnosis and treatment. On this basis, modern doctors have their own opinions. In clinical diagnosis and treatment, the treatment of bronchiectasis with traditional Chinese medicine has achieved remarkable results, which not only improves the quality of life of patients, but also provides new ideas for clinical treatment.

## References

- [1] Martin C, Regard L, Chassagnon G, Burgel PR. Diagnostic étiologique d'une dilatation des bronches [Bronchiectasis in adults: Etiological diagnosis]. *Rev Pneumol Clin*. 2018 Oct, 74(5):292-298.
- [2] Expert Consensus Writing Group for Diagnosis and Treatment of Adult Bronchiectasis. Expert Consensus on Diagnosis and Treatment of Adult Bronchiectasis. *Chinese Journal of Tuberculosis and Respiratory Diseases*, 2012, 35(07):485-492.
- [3] SHI Xia, WANG Bing, FAN Changzheng, YUAN Shasha, MIAO Qing, Research Progress on the Treatment of Bronchiectasis with Chinese Medicine[J], *Jiangxi Journal of Traditional Chinese Medicine*, 2024, 55(04):78-82.
- [4] Xu Jianxing, Fan Yixuan, Yi Liang, Yang Zhixu (Xiyuan Hospital, China Academy of Chinese Medical Sciences, Beijing 100091, China), Treatment of Bronchiectasis Based on the Theory of "Sores and Ulcers" in the Lungs from Orthodox Manual of External Diseases[J], *Journal of Emergency in Traditional Chinese Medicine*, 2024, 33(11):1950-1954.
- [5] LUO Ming-bi, ZHU Bao-hua, CHEN Ming-ling, A Probe into the Method of "Eliminating and Supplementing" in Waiké Zhengzong [J], *Traditional Chinese Medicine Journal*, 2022, 21(03):30-32.
- [6] JIANG Gan, WANG Bing, ZHANG Haiyan, CONG Xiaodong, MIAO Qing, Study on Treating Recurrent Bronchiectasis from the Perspective of "Latent Pathogens" [J], *Henan Traditional Chinese Medicine*, 2024, 44(10):1512-1517.
- [7] Yang Lu, Ao Suhua, Yuan Yulai. To explore the treatment of bronchiectasis from damp heat based on the theory of latent pathogen[J]. *Yunnan Journal of Traditional Chinese Medicine and Materia Medica*, 2023, 44(09): 11-14.
- [8] Sun Qixin. Discussion on Fuxie-Li Ke's Academic Thought (II)[J], *Traditional Chinese Medicine Journal*, 2007, (01):14-18.
- [9] WANG An'an, WANG Zherui, HUANG Weiling, PAN Weirong, MA Chengyong, LI Yanlan, ZHANG Tiansong, Discussion on the Treatment of Bronchiectasis Based on the Theory of Incubative Pathogenic Factors[J], *Chinese Journal of Information on Traditional Chinese Medicine*, 2024, 31(02):173-176.
- [10] HUANG Qifen, ZHANG Zhimin, Theoretical analysis and practice of bronchiectasis hemoptysis with the Concept of "Heat Transformation through Blood" [J], *Global Traditional Chinese Medicine*, 2024, 17(07): 1256-1260.
- [11] Bronchiectasis Expert Consensus Writing Group, Pulmonary Infection Assembly, Chinese Thoracic Society, Expert consensus on the diagnosis and treatment of adult bronchiectasis in China[J], *Chinese Journal of Tuberculosis and Respiratory Diseases*, 2021, 44(04):311-321.
- [12] ZHANG Haiyan, SHI Xia, ZHOU Ruiling, WANG Bing, MIAO Qing, Discussion on the Treatment of Bronchiectasis in Traditional Chinese Medicine based on Hypothesis of "Vicious Circle" [J], *Journal of Traditional Chinese Medicine*, 2023, 64(21): 2188-2191+2196.
- [13] Dai Chunfu, Zhang Xuwen, Guo Qianheng. Bitter cold detoxification is an important treatment of warm disease camp blood syndrome[J]. *Fujian traditional Chinese medicine*, 1985, (06):2-5.
- [14] Liu Yanbin, Yan Jun. Treatment of bronchiectasis based on 'blood and water disease'[J], *Hebei Journal of Traditional Chinese Medicine*, 2023, 45(12):2086-2089.
- [15] Ding Zhenyang, Sun Zikai, Liu Fang, et al. Cao Shihong's experience in the treatment of stable bronchiectasis[J]. *Hebei Journal of Traditional Chinese Medicine*, 2023, 45(05):713-716.
- [16] LI Keke, YAN Zhaoqi, LI Dian, DENG Yaxin, GU Wenli, HU Junfang, XU Yifeng, ZHANG Liang, LIU Liangji, XU Lei, Analysis on the experience of TCM master HONG Guangxiang's 'warming yang and promoting communication' method in the treatment of bronchiectasis in remission period[J], *China Journal of Traditional Chinese Medicine and Pharmacy*, 2024, 39(09):4730-4733.
- [17] Zhang Yuanbing, Wang Lihua, Hong Guangxiang. Hong Guangxiang's experience in treating bronchiectasis based on "pulmonary treatment not far from warming" theory [J], *Shanghai Journal of Traditional Chinese Medicine*, 2013, 47(02):1-4+19.
- [18] Wang Lihua. Hong Guangxiang experience in the treatment of bronchiectasis[J]. *China Journal of Traditional Chinese Medicine and Pharmacy*, 2007, (01): 50-51.
- [19] Yu Jianwei, Xue Hanrong, Zhang Yuanbing, et al. Brief summary of academic thoughts of national master of TCM HONG Guang-xiang on diagnosis and treatment for pulmonary diseases[J], *China Journal of Traditional Chinese Medicine and Pharmacy*, 2015, 30(11): 3824-3829.
- [20] ZHANG Jinzhi, FAN Yiling, YUAN Shasha, KONG Jinli, LI Rui, WEI Yuchen, MIAO Qing, Pathogenesis and treatment of bronchiectasis based on "healthy qi depletion leading to accumulation and injury" theory [J], *Beijing Journal of Traditional Chinese Medicine*, 2024, 43(10):1173-1176.
- [21] YUAN Sha-sha, WANG Ning, MIAO Qing, Clinical Observation of Bupi Qingfei Decoction in Treatment of Bronchiectasis Colonized by *Pseudomonas aeruginosa* [J], *Chinese Journal of Experimental Traditional Medical Formulae*, 2021, 27(24):118-124.
- [22] WANG Dan, GONG Xiaoyan, WANG Shuang, Professor Gong Xiaoyan's experience in treating bronchiectasis [J], *Jilin Journal of Chinese Medicine*, 2023, 43(02):156-159.
- [23] HUANG Jianhua, BAI Shulin, LIU Rui, Discussion on TCM treatment of pulmonary diseases based on the theory of "qi and blood" [J], *Shaanxi Journal of Traditional Chinese Medicine*, 2023, 44(04): 483-486.

- [24] WU Mei, DENG Xiangli, YANG Mei, Differentiation and treatment of bronchiectasis based on Lan Mao's theory of "Qi does not transport phlegm" [J], Journal of Sichuan of Traditional Chinese Medicine, 2024, 42(05): 48-51.
- [25] Yang Mei, Deng Xiangli, Shao Mei, etc. Probing into bronchiectasis based on the theory of 'Huangdi Neijing' and 'Five Zang-organs Harmonization'[J/OL]. Liaoning Journal of Traditional Chinese Medicine, 1-7 [2025-04-12]. <http://kns.cnki.net/kcms/detail/21.1128.r.20241216.0921.080.html>.
- [26] LI Guang-sen, WANG Bing, FAN Mao-rong, SU Wen-wen, WANG Wen-wen, MU Qing-xiang, ZHAO Xiao-li, LIU Feng-gu, Exploration of whole course diagnosis and treatment of bronchiectasis based on the theory of "Phlegm-Toxicity" [J], Beijing Journal of Traditional Chinese Medicine, 2023, 42(08):831-834.
- [27] Gorgeous, Zhang Ming, Jin Lianshun, etc. Professor Zhang Zhongde's experience in treating bronchiectasis by 'regulating five zang-organs'[J], Lishizhen Medicine and Materia Medica Research, 2023, 34(09): 2270-2272.