

Discussion on TCM Pathogenesis and Treatment of Lung Cancer

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Abstract: At home and abroad, the incidence and mortality of bronchial lung cancer are in the forefront of malignant tumors, and lung cancer poses a great threat to human health. The curative effect of integrated traditional Chinese and western medicine in the treatment of bronchial lung cancer is more significant than that of traditional Chinese medicine or western medicine alone. Therefore, according to some literatures about the treatment of lung cancer, this article will review the treatment of bronchial lung cancer with integrated traditional Chinese and western medicine from the aspects of traditional Chinese medicine combined with surgery, chemotherapy, radiotherapy, molecular targeted therapy and immunotherapy.

Keywords: lung cancer; TCM pathogenesis; integrated traditional Chinese and western medicine treatment

1. Introduction

Malignant tumor is one of the most common chronic diseases in clinic, which seriously endangers the life and health of patients. According to the statistics of globocan2020, there are about 19.293 million new cases of malignant tumors in the world, including about 2.206 million new cases of lung cancer and about 1.796 million deaths, as shown in Figure 1. The mortality rate of lung cancer ranks first and the incidence rate ranks second, second only to breast cancer ^[1], as shown in Figure 2. According to the registration data of malignant tumors in Shaanxi Province from 2015 to 2019, the number of lung cancer deaths is about 9540, which is the highest among all malignant tumors ^[2]. By predicting the trend of the mortality rate and the number of deaths from 2015 to 2029, it is found that the number of lung cancer deaths will continue to increase in the next 15 years, and the total number of deaths due to lung cancer in China will continue to increase from 2025 to 2029. The aging of the population in China has become the main reason for the rising number of lung cancer deaths ^[3], as shown in Figure 3.

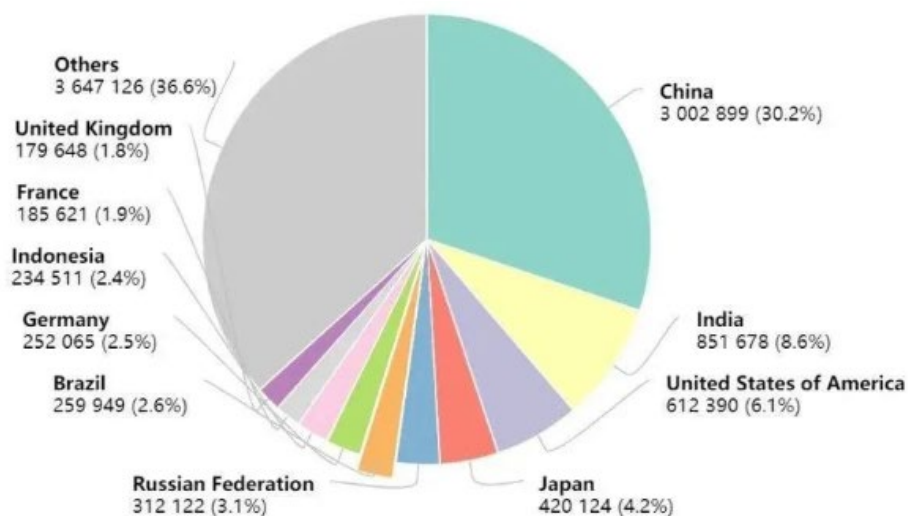


Figure 1: Number of cancer deaths in various countries in 2020

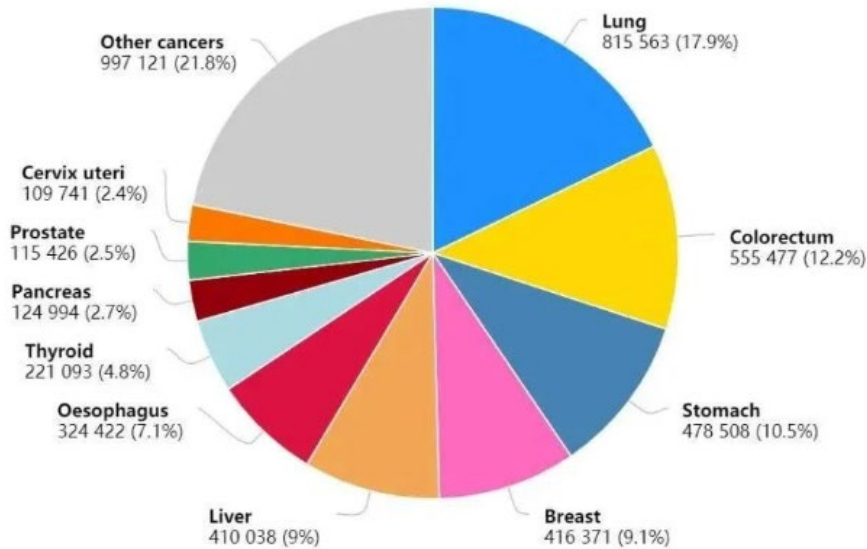


Figure 2: Top Ten Cancer Types in China's New Incidents of Cancer in 2020

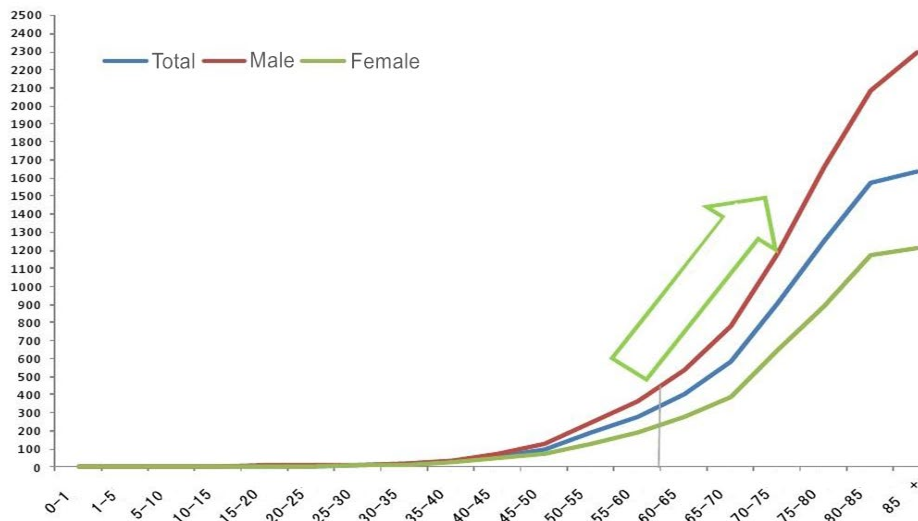


Figure 3: Incidence rate and mortality of cancer in China (by age)

2. Understanding of the Pathogenesis of Lung Cancer in Traditional Chinese Medicine

Lung cancer is a disease name in modern medicine. In the history of traditional Chinese medicine, there is no such name as lung cancer. It is mainly attributed to such diseases as "cough" and "lung accumulation". Traditional Chinese medicine believes that the causes of lung cancer can be divided into five main categories, namely: deficiency of vital qi; Invasion of pathogenic toxins; Internal injury of seven emotions; Eating disorders; Inappropriate work and rest. It is mentioned in Plain Questions that "where the pathogenic factors gather together, the vital energy will be deficient", which shows that the basic pathogenesis of lung cancer is the deficiency of vital energy, and the pathogenic factors are easy to enter by taking advantage of the deficiency; Gao Bingjun, a physician in the Qing Dynasty, said that "Cancer is not caused by the accumulation of yin and Yang qi, but by the accumulation of blood stasis, turbid qi and phlegm in the five viscera." It shows that the formation of lung cancer is mainly due to the fact that the lung is a delicate organ, which is vulnerable to the invasion of tobacco poison, industrial pollution, radioactive substances, etc., and that the evil poison is detained and accumulated in the lung for a long time. The formation of lung cancer is closely related to healthy qi deficiency, qi depression, blood stasis, phlegm coagulation and cancer toxin. Liu Jiexiang, a master of traditional Chinese medicine, founded the theory of "strengthening the body resistance to treat cancer" based on the experience of famous doctors of different generations in treating cancer and his own clinical

practice, and proposed that the root cause of cancer was the deficiency of healthy qi ^[4]. Professor Piao Bingkui believes that the interaction between the deficiency of vital qi and the invasion of toxin leads to the accumulation of toxin and lung cancer ^[5]. Professor Cao Guoli believes that the basic pathogenesis of lung cancer is deficiency of vital qi and accumulation of pathogenic factors ^[6]. Professor Zhou Zhongying believes that the pathological basis of lung cancer is phlegm, blood stasis, depression, toxin and healthy qi deficiency ^[7]. Professor Zhou Daihan believes that lung cancer is caused by deficiency, phlegm, blood stasis. The etiology and pathogenesis are deficiency of vital qi, invasion of pathogenic toxins, and cementation of phlegm and blood stasis ^[8]. Jiang Tianyou believes that cancer consumes qi, blood and body fluid of the lung, burns the yin essence of the lung, the healthy qi of the lung is gradually lost, and the pathogenic qi of cancer is gradually strengthened, thus affecting the viscera of the whole body and causing physiological dysfunction ^[9]. Professor Yu Rencun believes that the occurrence of lung cancer is mainly related to the invasion of pathogenic toxin into the lung, the accumulation of phlegm-dampness and the internal deficiency of healthy qi ^[10]. Lung cancer is the result of the interaction between the deficiency of vital qi and the invasion of pathogenic toxins, which can be highly summarized as endogenous cancer.

3. Syndrome differentiation and treatment principle of lung cancer

Treatment based on syndrome differentiation is one of the main characteristics of the theoretical system of traditional Chinese medicine. According to the symptoms and signs of patients, the etiology, location, nature and potential of the disease are identified, so as to determine the treatment principles and methods. Different physicians have slightly different dialectical analysis of lung cancer, so there are also some differences in treatment. Based on years of clinical experience, Professor Liu Weisheng roughly divided lung cancer into 6 syndrome types and treated them with prescriptions, they are qi stagnation and blood stasis type, yin deficiency and internal heat type, deficiency of both qi and yin type, qi deficiency and phlegm-dampness type, type of excessive toxic heat and type of water invasion due to Yang deficiency ^[11]. Based on years of clinical experience, Professor Zhang Daizhao divided lung cancer into five syndrome types according to the four diagnostic methods of traditional Chinese medicine, which were spleen and lung qi deficiency, yin deficiency and internal heat, accumulation of phlegm and dampness in the lung, qi stagnation and blood stasis, and deficiency of both lung and kidney ^[12]. Professor Zhou Zhongying, a master of traditional Chinese medicine, based on years of clinical experience and the information of the four diagnostic methods of traditional Chinese medicine, roughly divided lung cancer into five syndrome types and treated them with prescriptions, namely, cancer toxin obstructing the lung type, phlegm turbid obstructing the lung type, qi stagnation and blood stasis type, deficiency of both qi and yin, weakness of spleen and stomach ^[13]. Based on years of clinical experience, Professor Zhang Xuewen, a master of traditional Chinese medicine, roughly divided lung cancer into five syndromes and treated them with prescriptions according to the information of the four diagnostic methods of traditional Chinese medicine. They were deficiency of qi and yin, accumulation of heat toxin, phlegm and turbid retention, accumulation of toxin and blood stasis, and deficiency of both yin and Yang ^[14]. Because the TCM typing of lung cancer is affected by many factors, there is no unified typing of lung cancer in the domestic medical community. However, the treatment principle of lung cancer is basically the same, which is to strengthen the body resistance and eliminate pathogens, attack and tonify simultaneously (strengthening the body resistance without leaving pathogens, Dispelling pathogenic factors without damaging vital qi). Among them, in the early stage of lung cancer, it is mainly to attack pathogens, in the middle stage, it is to attack and tonify. And in the late stage, it is mainly to tonify deficiency.

4. Treatment of lung cancer with integrated traditional Chinese and western medicine

The treatment of lung cancer with integrated traditional Chinese and western medicine has a significant clinical effect. Therefore, the treatment of lung cancer with integrated traditional Chinese and Western medicine is now commonly used in clinical treatment. The treatment of lung cancer with integrated traditional Chinese and Western medicine can not only reduce the possible adverse reactions of Western medicine treatment, but also further improve the overall efficacy of patients. In the treatment of lung cancer with integrated traditional Chinese and Western medicine, different treatment schemes are adopted in different periods. In the advanced stage, western medicine treatment such as surgery, radiotherapy and chemotherapy, targeting and immunity is the main treatment, and traditional Chinese medicine treatment is the supplement. Traditional Chinese medicine is the main treatment, supplemented by the removal of residual cancer cells.

4.1. Combined Traditional Chinese medicine surgery treatment

The most effective treatment for lung cancer with traditional Chinese medicine combined with surgery is surgery. Surgical treatment can cure early lung cancer, but it also has some disadvantages. Lung cancer surgery and postoperative bed immobilization often cause a series of complications, the most common complications are respiratory and cardiovascular system complications, Chinese medicine treatment can reduce the incidence of complications; Surgery also caused a series of damage to the patient's body, so that the quality of life of patients declined sharply, cannot be restored in a short period of time. Traditional Chinese medicine treatment can support the energy needed by the patient's body to a certain extent and improve the therapeutic effect. There are many lung cancer patients recurrence after surgery. Patients with postoperative recurrence and metastasis, traditional Chinese medicine combined with surgical treatment can reduce the recurrence rate and metastasis rate of lung cancer after surgery to a certain extent. Professor Zhang Daizhao [12] used the traditional Chinese medicine for benefiting qi and nourishing blood before the operation of lung cancer patients to adjust the patient's body to the best state, so as to facilitate the smooth operation; It can also make up for the injury caused by the operation to ascertain extent, promote wound healing, and restore physical strength as soon as possible; In order to prevent recurrence and metastasis after operation, Shengmai Yin is usually used to benefit qi and nourish yin, and the traditional Chinese medicine for strengthening the spleen and stomach and the traditional Chinese medicine for detoxification and anti-cancer are added. Wang Zhenhui [15] observed the clinical efficacy of 55 patients with lung cancer in perioperative period. The method of clearing heat and resolving phlegm for lung cancer patients with phlegm-heat combination in perioperative period can improve the immune function of patients and contribute to the recovery of gastrointestinal function of patients after operation. Fu Zhaoqing et al. [16] observed the clinical efficacy of 107 patients with non-small cell lung cancer treated by surgery, and concluded that Bufe Huoxue Decoction could reduce the inflammatory reaction of patients with non-small cell lung cancer after surgery and rapidly promote the recovery of patients.

4.2. Radiotherapy combined with traditional Chinese medicine

Radiotherapy is one of the effective means commonly used for lung cancer, which can alleviate local symptoms, reduce the pain of patients and prolong the survival time of patients, but radiotherapy can also produce a series of toxic side effects and complications. The combination of traditional Chinese medicine and radiotherapy can not only reduce the side effects of radiotherapy, but also increase the radiosensitivity of lung cancer and improve the therapeutic effect of lung cancer. Zhang Zhenjun et al. [17] observed the clinical efficacy of 90 lung cancer patients undergoing radiotherapy, and the results showed that Shenqi Fuzheng Injection had better effect than Aidi Injection during radiotherapy for lung cancer. Liu Qing [18] observed the clinical efficacy of 100 patients with acute radiation pneumonia after radiotherapy for lung cancer. The conclusion showed that the use of Weijing Decoction combined with conventional western medicine in the treatment of patients with acute radiation pneumonia after radiotherapy for lung cancer could reduce the occurrence of adverse reactions and improve the therapeutic effect. Qin Xiaoqing et al. [19] observed the clinical efficacy of 68 patients with lung cancer treated by radiotherapy, and concluded that: The combined treatment of Chinese and western medicine for radiation pneumonitis caused by radiotherapy of lung cancer is significantly better than the conventional treatment of western medicine alone. Wang Xingying et al. [20] observed the clinical efficacy of 60 cases of lung cancer patients with radiotherapy, and concluded that hot ironing of Zusanli acupoint can alleviate the adverse reactions caused by lung cancer radiotherapy, improve the clinical efficacy of patients and enhance appetite.

4.3. Traditional Chinese medicine combined with chemotherapy

Chemotherapy is an effective method for the treatment of lung cancer, which uses chemical drugs to kill lung cancer cells. Chemotherapy can quickly kill most cancer cells, but it can also cause a series of toxic side effects, mainly gastrointestinal reactions, bone marrow suppression and damage to the heart, liver and kidney. The combination of traditional Chinese medicine therapy and chemotherapy can not only reduce the side effects caused by chemotherapy and enhance the efficacy of drugs, but also improve the effect of chemotherapy. Wang Hui Feng et al. [21] observed the clinical efficacy of 50 patients with advanced lung cancer, and concluded that Guben Jiedu Decoction combined with chemotherapy can improve the quality of life of patients to a certain extent, reduce the pain during chemotherapy, and play an important role in the treatment of advanced lung cancer. Wang Zhenqiang et al. [22] observed the clinical efficacy of 100 patients with lung cancer treated with chemotherapy, and

the conclusion showed that traditional Chinese medicine prescription for reducing lung tumor accumulation combined with chemotherapy could reduce the toxic and side effects caused by chemotherapy. And it had synergistic effect, which could improve the differentiation of clinical efficacy for non-small cell lung cancer with phlegm stasis syndrome. Li Mingchun et al. [23] observed the clinical efficacy of 80 patients with small cell lung cancer undergoing chemotherapy, and concluded that compound E-jiao syrup could alleviate bone marrow suppression and promote the recovery of patients. Wang Zhuoxi et al. [24] showed that the combination of tonic traditional Chinese medicine injection and chemotherapy has obvious advantages in the treatment of non-small cell lung cancer, which can improve the effect of chemotherapy and reduce adverse reactions. Zhang Hua et al. [25] observed the clinical efficacy of advanced non-small cell lung cancer patients receiving chemotherapy, and concluded that: Shenqi Fuzheng injection combined with chemotherapy can improve the clinical efficacy of patients, and reduce the immunosuppression and toxic side effects caused by chemotherapy. He Shengyan's [26] observation and research on 80 patients with lung cancer chemotherapy-related insomnia showed that the effect of acupoint application of traditional Chinese medicine combined with Estazolam was more significant than that of Estazolam alone in the treatment of cancer-related insomnia, which could improve the quality of sleep and life of patients.

4.4. Traditional Chinese medicine combined with molecular targeted therapy

Targeted therapy is a kind of treatment aimed at the unique gene abnormalities of lung cancer at the cellular and molecular level. When targeted drugs enter the human body, they will specifically induce apoptosis of lung cancer cells in vivo. In the treatment of lung cancer, the status of targeted therapy is gradually rising. Lung cancer patients feel the significant clinical effect when they receive targeted therapy, but the occurrence of adverse reactions and drug resistance also seriously affects the therapeutic effect. Traditional Chinese medicine combined with molecular targeted drugs for lung cancer, it can reduce a series of adverse reactions caused by targeted drugs, improve the therapeutic effect, and delay or even reverse drug resistance [27]. Ye Haiying et al. [28] observed the clinical efficacy of lung cancer patients with lung and spleen qi deficiency syndrome and receiving targeted therapy, and the results showed that the clinical effect of Fuzheng Sufei Decoction combined with gefitinib in the treatment of lung cancer with lung and spleen qi deficiency syndrome was obvious, which could reduce the side effects caused by targeted drugs and play a synergistic role in the treatment. Professor Rong yuanming [29] believes that the main reason for EGFR-TKI resistance in patients with primary lung cancer is excessive dryness and heat in the body, which damages Qi and Yin in the body and is closely related to the spleen, lung and other organs. It is suitable for nourishing yin and replenishing qi, regulating spleen and stomach, strengthening body resistance and resisting cancer. Bufei Xiaoji Decoction can effectively improve the clinical symptoms of patients, inhibit and reverse the drug resistance of EGFR-TKS.

4.5. Traditional Chinese medicine combined with immunotherapy

The immunotherapy of lung cancer is to use drugs through intravenous injection to enhance the patient's own immune function to kill lung cancer cells. The prognosis of lung cancer patients was significantly improved after immunotherapy, and the adverse reactions such as rash, insomnia and loss of appetite also occurred after immunotherapy. Traditional Chinese medicine has an overall regulatory role in anti-tumor, which can effectively improve the immune function of the body. The application of combined immunotherapy in lung cancer has a synergistic effect, and also increases the safety [30]. According to the results of follow-up of patients with non-small cell lung cancer, Liu Peng [31] concluded that in the treatment, the immune function of patients could be improved and the quality of life could be improved by adding Xiaojiyin combined with cytokine-induced killing cell immunotherapy. Zhang Xingxing's [32] experimental studies have shown that Qiyu Sanlong Decoction can improve the survival status and immune function of mice with lung cancer to a certain extent, inhibit the growth of lung transplanted tumors and kill lung cancer cells.

5. Conclusions

Due to the increasing incidence and mortality of lung cancer, the treatment of integrated traditional Chinese and Western medicine has become the Common treatment of lung cancer in China. In the process of treating lung cancer, the essence of modern medicine and traditional Chinese medicine is combined and reasonably applied. Various treatment methods that have been used in clinical practice.

For lung cancer patients, it has the following characteristics and advantages: Attenuation and synergy, inhibit and kill cancer cells, enhance immunity, stabilize tumors, alleviate pain, improve quality of life, prolong life and so on. The treatment of lung cancer with integrated traditional Chinese and western medicine has obvious advantages and broad prospects for development, but we should continue to sum up experience, establish a more scientific and reasonable treatment plan, make it systematic and standardized, and further improve the treatment effect of lung cancer.

References

- [1] Liu Zongchao, Li Zhexuan, Zhang Yang, Zhou Tong, Zhang Jingying, You Weicheng, Pan Kaifeng, Li Wenqing. Interpretation of 2020 Global Cancer Statistics Report [J]. *Electronic Journal of Cancer Comprehensive Therapy*, 2021, 7 (02): 1-14.
- [2] Qiu Lin, Sa Rina, Liu Rong, Wang Weihua. Analysis on the epidemiological characteristics of malignant tumor mortality and life loss in Shaanxi Province from 2015 to 2019 [J]. *Chinese Journal of Chronic Disease Prevention and Control*, 2021, 29 (01): 23-28.
- [3] Wang Lijun. Analysis and prediction of lung cancer mortality trend in China from 1987 to 2029 [D]. Wuhan University, 2017.
- [4] Liu Lingshuang, Zhang Peng, Jiang Yi, Shen Liping, Liu Jiexiang. Clinical effect of Fuzheng therapy on lung cancer and its immunomodulatory effect on the body [J]. *Nature*, 2019, 41 (04): 281-286.
- [5] Hu Hao, Cai Xiaoping. Piao Bingkui's Experience in Treating Lung Cancer [J]. *Chinese Folk Therapy*, 2017, 25 (05): 10-12.
- [6] Huang Xiangchun, Cao Guoli. Professor Cao Guoli's Experience in Treating Lung Cancer [J]. *Journal of Hunan University of Traditional Chinese Medicine*, 2021, 41 (04): 603-607.
- [7] Wang Shanshan, Guo Ming, Zhu Biao, Guo Lizhong. Professor Zhou Zhongying's Experience in Treating Lung Cancer [J]. *Chinese Journal of Traditional Chinese Medicine*, 2015, 30 (12): 4332-4335.
- [8] Deng Yunzong, Sun Hongxin, Zheng Xijun. Professor Zhou Daihan's experience in treating lung cancer. *Journal of Traditional Chinese Medicine*, 2017, 32 (3): 318-321.
- [9] Jiang Tianyou. Experience in differentiation and treatment of lung cancer [J]. *Shanxi Traditional Chinese Medicine*, 2008, (12): 3-5.
- [10] Jin Yishun. Professor Yu Rencun's Experience in Treating Lung Cancer [J]. *Guangming Traditional Chinese Medicine*, 2019, 34 (07): 1004-1007.
- [11] Chen Xian. Analysis of Professor Liu Weisheng's Clinical Experience in the Treatment of Lung Cancer. *Clinical Research of Traditional Chinese Medicine*, 2018, 10 (18): 123-124.
- [12] Cui Huijuan. Professor Zhang Daizhao's Experience in Treating Lung Cancer with Traditional Chinese Medicine [D]. China Academy of Chinese Medical Sciences, 2012.
- [13] Cai Yun, Chen yuanbin, Ye Fang, Wu Lei, Li Liu, Lin Lin. Experience of Traditional Chinese Medicine Master Zhou Zhongying in Differentiating and Treating Lung Cancer Based on the Theory of Cancer Toxicity [J]. *Chinese Journal of Traditional Chinese Medicine*, 2020, 35 (06): 2879-2882.
- [14] Dong Bin, Liu Xuyin, Zhang Hongwei, Zhang Xuwen. Experience of Traditional Chinese Medicine Master Zhang Xuwen in Treating Lung Cancer [J]. *Journal of Hunan University of Traditional Chinese Medicine*, 2018, 38 (03): 238-241.
- [15] Wang Zhenhui. Clinical observation on the effect of clearing heat and resolving phlegm in the treatment of patients with non-small cell lung cancer during perioperative period [D]. *Guangzhou University of Chinese Medicine*, 2016.
- [16] Fu Zhaoqing, Zhang Yunjie, Shi Jin. Clinical study of Bufei Huoxue Decoction in promoting postoperative rapid recovery of patients with non-small cell lung cancer [J]. *Journal of Nanjing University of Traditional Chinese Medicine*, 2020, 36 (06): 804-808.
- [17] Zhang Zhenjun, Yang Xinyan, Bai Lu, Gao Dongqi, Zhang Jingjing, Lian Xiangyao, Hu Chanchan, Li Qingshan. Effect of Shenqi Fuzheng Injection on TCM Syndrome of Patients with Lung Cancer Treated by Radiotherapy [J]. *Hebei Medical Journal*, 2017, 23 (06): 905-908.
- [18] Liu Qing. Clinical observation on the treatment of acute radiation pneumonitis after radiotherapy of lung cancer with modified Weijing Decoction combined with western medicine. *Chinese Folk Therapy*, 2020, 28 (13): 49-50.
- [19] Qin Xiaoping. Therapeutic effect of Qishen Yifei Decoction combined with western medicine on radiation pneumonitis caused by radiotherapy of lung cancer [J]. *Clinical research of traditional Chinese medicine Research*, 2021, 13 (01): 70-73.
- [20] Wang Xingying, Li Junyu, Luo Shulan. Effect evaluation of Zusanli acupoint hot ironing for lung cancer patients undergoing radiotherapy [J]. *Journal of Nursing*, 2019, 34 (24): 36-38.

- [21] Wang Hui Feng, Huang Meihong, Chu Zhifeng. *Clinical observation of traditional Chinese medicine combined with chemotherapy in the treatment of advanced lung cancer. Journal of Clinical Medical Literature*, 2019, 6 (05): 139.
- [22] Wang Zhenqiang, Zhang Qingjiang, Chen Jingjing, Zhao Yang, Li Xiaojiang, Dong Xueshan, Zhao Fang, Li Ying. *Effect of Feiliu Xiaoji Fang on Chemotherapeutic Adverse Reaction of Non-small Cell Lung Cancer Patients with Phlegm and Blood Stasis [J]. Shanghai Journal of Traditional Chinese Medicine*, 2021, 55 (04): 45-49.
- [23] Li Mingchun, Liao Jiahua, Lu Zenghong, Wu Longqiu, Shi Huaqiu. *Clinical observation of compound E-jiao syrup combined with EP chemotherapy for extensive small cell lung cancer [J]. Journal of Gannan Medical College*, 2019, 39 (02): 129-131.
- [24] Wang Zhuoxi, Ban Jifang, Ke Rui. *Meta-analysis of the effect of traditional Chinese medicine injection combined with chemotherapy in the treatment of non-small cell lung cancer. Journal of Traditional Chinese Medicine*, 2020, 26 (16): 167-175.
- [25] Zhang Hua, Liu Kuikui, Shi Gonghang. *Short-term efficacy, immune function and long-term survival of Shenqi Fuzheng injection combined with GP regimen in the treatment of non-small cell lung cancer [J]. Journal of Clinical and Experimental Medicine*, 2021, 20 (01): 28-31.
- [26] He Shengyan. *Clinical observation of traditional Chinese medicine acupuncture application in the treatment of cancer-related insomnia in patients with lung cancer chemotherapy [J]. China Science and Technology of Traditional Chinese Medicine*, 2021, 28 (02): 281-283.
- [27] Li Guangda, Ma Yunfei, Cheng Peiyu, Yu Mingwei, Wang Xiaomin. *Molecular mechanism and research progress of traditional Chinese medicine reversing EGFR-TKIs in the treatment of acquired resistance of NSCLC [J]. Chinese Medicine Herald*, 2020, 26 (01): 114-118.
- [28] Ye Haiying, Hu Lingjing, Han Ronglong, Zhu Lifan, Guo Tingting, He Miao, Liu Xiangyu, Zhang Guoduo. *Clinical Observation on 36 Cases of Lung Adenocarcinoma with Deficiency of Lung and Spleen Qi Treated by Fuzheng Sufei Mixture Combined with Gefitinib. Chinese Medicine Herald*, 2021, 27 (01): 95-98.
- [29] Jiang Ruiyuan, Mo Chunmei, Man Tingting, Hong Xiaohua, Qin Yanchun, Wang Tongbiao, Rong Zhen. *Experience of Professor Rong yuanming, a famous veteran doctor of traditional Chinese medicine in China, in treating EGFR-TKIs resistance of lung cancer by supplementing qi and nourishing yin [J]. Shi Zhen Guo Yi Guo Yao*, 2020, 31 (09): 2265-2268.
- [30] Chen Lanyu, Hu Kaiwen. *Research progress on traditional Chinese medicine improving tumor immunosuppressive microenvironment based on PD-1/PD-L1 signaling pathway [J]. Chinese Journal of Traditional Chinese Medicine Information*, 2020, 27 (02): 135-137.
- [31] Liu Peng. *Role of Xinjia Xiaoji Decoction combined with cellular immunotherapy in the treatment of advanced NSCLC with Erlotinib [D]. Guangzhou University of Chinese Medicine*, 2016.
- [32] Zhang Xingxing. *Study on the mechanism of Qiyusanlong Decoction in treating NSCLC through PD-1/PD-L1 and PTEN/PI3K/Akt pathway [D]. Hubei University of Traditional Chinese Medicine*, 2017.