

Research progress in traditional Chinese medicine treatment of pediatric pneumonia

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Abstract: In recent years, the incidence of pediatric pneumonia gradually increased, most children with the onset of fast disease, serious disease, many complications, easy to relapse, seriously affect the quality of life of children. Simple western medicine treatment is easy to produce drug resistance, with many adverse reactions, and the treatment effect is not ideal. Traditional Chinese medicine treatment for pediatric pneumonia has unique advantages, plays an important role in the treatment, can adjust the immune function of the body, promote the resolution of inflammation, reduce the occurrence of complications, and improve the treatment effect. Therefore, this paper reviews the research of TCM treatment of pediatric pneumonia in order to provide theoretical basis and evidence-based support for the TCM clinical treatment of pediatric pneumonia.

1. Introduction

Pediatric pneumonia refers to a pulmonary infectious disease occurring in children, with common pathogens including viruses, bacteria and so on. Its onset is fast, the disease is serious, with fever, cough and other main clinical manifestations, and most of the children cause a variety of complications, and easy to relapse [1]. In recent years, the number of cases of pediatric pneumonia has increased year by year, which seriously affects the quality of life of children [2]. This disease can be seen throughout the year in autumn and winter. The World Health Organization lists it as one of the three important pediatric diseases in the world, and it is one of the main causes of death in children under 5 in the world [3-4]. At present, western medicine mainly adopts anti-infection treatment, mainly using amoxicillin, azithromycin and other drugs; but because of the physiological characteristics of pediatric pneumonia have certain particularity, pediatric immune system and intestinal flora is not sound, a large number of long-term use of antibiotics will not only cause intestinal flora disorders but also produce resistance and other adverse reactions, so most of the treatment effect is not ideal, some children with stable condition often relapse [5-6]. The treatment of infectious diseases has unique advantages, which plays an important role in the treatment of children's pneumonia and cough. It can adjust the immune function of the body, promote the

resolution of inflammation, reduce the occurrence of complications and improve the treatment effect.

2. Traditional Chinese medicine to treat pediatric pneumonia

Pediatric pneumonia belongs to the category of "pneumonia asthma" in traditional Chinese medicine, first seen in Wang Ang's "Tang Head Song formula Xie Bai San" [7], it is a common pulmonary disease with fever, cough, shortness of breath, phlegm, and nasal irritation as the main clinical manifestations. Children's viscera is delicate, insufficient essence qi, health is not solid, easy to external evil infection, lung loss, refining solution into phlegm, blocked in the airway, causing various symptoms. According to the latest guidelines [8], pediatric pneumonia cough can be divided into normal syndrome and variable syndrome, common syndrome has cold closed lung syndrome, wind heat closed lung syndrome, phlegm heat closed lung syndrome, damp heat closed lung syndrome, toxic heat closed lung syndrome, Yin deficiency lung heat syndrome, lung temper deficiency syndrome, the negative syndrome. The treatment of TCM in pediatric pneumonia should be different from person to person, with syndrome differentiation and overall treatment, reflecting the unique advantages of TCM treatment. A large number of studies have shown that Chinese medicine preparations such as TCM compound, proprietary Chinese medicine, Traditional Chinese medicine injection, traditional Chinese medicine therapies such as acupuncture and massage therapy and acupoint application have good treatment effects on children's pneumonia.

2.1. Chinese medicine preparation

2.1.1. Traditional Chinese medicine compound

Traditional Chinese medicine compound refers to the traditional Chinese medicine preparation composed of a variety of traditional Chinese medicine and mixed in a certain proportion. Traditional Chinese medicine treatment of children pneumonia should be mainly lung opening and closing, phlegm and asthma. Open the lung to restore the function of the lung gas, so that its publicity as usual cough and asthma self-calm. If phlegm accumulation, removes phlegm; if the asthma is severe, trend to manage|trust to manage|that to manage|thread to manage|great to manage|trees to manage|dream to manage|tree to manage|create to manage|street to manage qi and smooth asthma; if qi stagnation and blood stasis; in the lung and large intestine, in the form, combine Chinese and Western medicine. In the later stage of the disease, the main strengthening, and clearing the remaining evil. For those with deficiency of lung and spleen qi, it is recommended to strengthen the spleen, replenish the lungs, and replenish qi. If there is yin deficiency and lung heat, it is advisable to cool and nourish yin, moisten the lungs, and dissipate phlegm. Huagai Powder is often used to treat wind cold closed lung syndrome. Yu Xuming et al. analyzed the therapeutic effect of Huagai Powder on pediatric bronchopneumonia based on syndrome differentiation. The results showed that the duration of various symptoms in the observation group was significantly shorter than that in the control group, indicating that combining Huagai Powder with syndrome differentiation and reduction therapy on the basis of conventional Western medicine can alleviate various symptoms in patients, reduce the severity of symptoms, and shorten the duration of symptoms, It can also improve sleep time [9]. MaxingShigsoup combined with YinQiao powder addition and subtraction is used for children with pneumonia cough, wind heat and closed lung syndrome, which can improve the lung function of children with pneumonia cough, wind heat and closed lung syndrome, improve the symptoms of fever, asthma, expectoration and lung wet rales, promote recovery and reduce adverse reactions [10]. Wuhu Tang Li jujube lung soup plus and minus treatment of children with phlegm fever closed pneumonia, the effect is significant, can significantly improve the Chinese medicine syndrome points, promote the relief of symptoms and signs, and can reduce the body inflammatory reaction, enhance the immune function [11]. Manna

disinfection Dan and three kernel soup can effectively treat children with pneumonia and cough of dampness and heat, and has a significant effect in dilute paste stool, yellow thick and greasy moss and antipyretic [12]. Modified Sha Shen Mai Dong Tang is used to treat pediatric pneumonia with yin deficiency and lung heat syndrome. In the recovery period of treating pediatric mycoplasma pneumonia, its efficacy is significant, it can effectively shorten the recovery time of the disease, and has high safety, which can effectively reduce the occurrence of complications. This is a treatment method worthy of clinical promotion [13-14]. Huanglian Jiedu Tang and Mahuang Almond Glycyrrhiza Gypsum Tang are added or reduced for the syndrome of toxic heat closing the lung. Ginseng Schisandra chinensis Decoction is used for the syndrome of deficiency of lung and spleen qi. Shen Fu Long Mu Jiu Ni Tang is used for the syndrome of heart yang deficiency and decline. Lingjiao Gouteng Tang is used for the syndrome of pathogenic depression and jue yin.

2.1.2. Chinese patent medicine

In the treatment of proprietary Chinese medicine pneumonia in children, the commonly used proprietary Chinese patent medicine is isatidis root granules, children's lung oral liquid, children's heat granules, etc. These Chinese patent medicines can promote the resolution of inflammation and accelerate the recovery of lung lesions by clearing away heat and detoxifying, moistening the lung and resolving phlegm. Specifically, isatidis granule is a commonly used Chinese medicine, the main ingredient is isatidis root, with the effect of clearing heat and detoxification, moistening lung and phlegm, can be used to treat children pneumonia, acute pharyngitis and other diseases. Children Qingfei oral liquid is a kind of Chinese patent medicine of clearing heat and detoxification, moistening lung and resolving phlegm. The main components are gypsum, mulberry white skin, forsythia, baicalensis, etc., which is suitable for children's pneumonia, acute laryngitis and other diseases. Studies have shown [15], Qinglung oral liquid is an effective and safe drug in the treatment of pediatric viral pneumonia. Children's heat granule is a kind of Chinese patent medicine to clear heat and detoxification, moistening lung and resolving phlegm. The main ingredients are astragalus, Sichuan shellfish, Platycodon grandiflorum, etc. They are suitable for children's pneumonia, bronchitis and other diseases. Studies have shown [16], the treatment of mycoplasma pneumonia in children is effective, can effectively inhibit the inflammatory reaction, enhance the immune function of children, and few adverse reactions.

2.1.3. Traditional Chinese medicine injection

Traditional Chinese medicine injection refers to the injection made of traditional Chinese medicine preparations, which is directly input into the human body through injection, so as to achieve the functions of clearing away heat and detoxification, moistening lung and resolving phlegm, and enhancing immunity. In the treatment of pediatric pneumonia, traditional Chinese medicine injection can promote the resolution of inflammation and accelerate the recovery of lung lesions by directly acting on the lesions.

Commonly used Chinese medicine injection for the treatment of children pneumonia are Qingdai injection, Qingrejiedu injection, children cold injection, etc. These TCM injections have the functions of clearing away heat and detoxification, moistening lung and resolving phlegm, and enhancing immunity, which can effectively treat respiratory diseases such as pneumonia in children. Furthermore, the study noted [17], Xiyaping injection is used for wind heat closed lung syndrome, sputum heat closed lung syndrome, toxic heat closed lung syndrome. Xiyaping injection can effectively inhibit and kill most gram-positive and negative bacteria, but also inhibit the fever caused by pneumococcus, endotoxin, hemolytic streptococcus, inhibit the excessive release of pro-inflammatory factors, so that the level of pro-inflammatory and anti-inflammatory factors in a dynamic balance [18]. Sputum reqing injection is used for wind heat closed lung syndrome and sputum heat closed lung syndrome. Hot poison Ning injection is used for phlegm heat closed lung syndrome and poison heat closed lung syndrome. Revenom injection has some inhibitory effect on

Staphylococcus aureus and *Haemophilus influenzae* [19]. TCM injections should be used with caution or prohibited in infants and children with allergies. In short, the treatment of pneumonia in children with TCM injections can promote the resolution of inflammation, shorten the course of the disease, and reduce the degree and duration of fever, cough, dyspnea and other symptoms.

2.2. Chinese medicine characteristic therapy

2.2.1. Acupuncture and treatment

Acupuncture is a kind of non-drug treatment for pediatric pneumonia in traditional Chinese medicine. By stimulating specific acupoints, it regulates the immune function of the body and promotes the resolution of inflammation. In a study by Zhou Yanrong et al. [20], acupuncture treatment was performed for 32 children with chronic pneumonia and acute pneumonia. Hegu, Quchi, Zusanli, Sanyjiao, Fenglong and other acupoints were selected. If fever was combined with less quotient and large vertebra. After treatment, all the patients were cured, the expectoration disappeared, the fever retreated, and the children moved freely. Studies [21] have shown that acupuncture combined with phentolamine treatment can not only quickly cooling, but also anti-inflammation, cough, asthma, quickly shorten the course of disease, and no obvious side effects, quick effect, good effect, is one of the methods that can be promoted.

In short, acupuncture can relieve cough, asthma and other symptoms, reduce the degree and duration of fever, and promote the recovery of children. However, for most children will be afraid of needles, we should pay attention to actively communicate with the children and their families, patient counseling, and promote the implementation of acupuncture treatment with the assistance of parents.

2.2.2. Massage therapy for children

Children's massage through massage, massage, beating and other techniques to stimulate the human body acupoints, in order to regulate qi and blood, improve the body function, to achieve the purpose of treating diseases. In the treatment of children's pneumonia, children's massage can promote the blood circulation and air flow of the respiratory system by stimulating the relevant acupoints, enhance the disease resistance of the lungs, so as to relieve inflammatory symptoms and improve the cure rate. In the clinical observation of Wang, et al. [22], with 200 cases of children with bronchopneumonia and their families as the research object, the study shows that pediatric massage can play a good auxiliary role in the treatment of bronchopneumonia in children, help to improve the clinical symptoms of children, shorten the treatment time of the disease, and reduce the risk of reinfection in children, which is worthy of further research and promotion. Gao Jingjing [23] discussed the treatment of infantile pneumonia by the four major pediatric massage schools, and concluded that the four major pediatric massage schools are rooted in Traditional Chinese medicine. They all follow the four diagnostic and dialectical laws of traditional Chinese medicine in the diagnosis and treatment of diseases, but also have their focus. It is a very applicable and effective auxiliary treatment, even a main treatment. Especially in the early and recovery stages of infantile pneumonia, it has advantages that cannot be replaced by other treatments, The acupoints for treating pediatric pneumonia include Feishu, Fengmen, Dazhui, and Tanzhong. Massaging these acupoints can stimulate the lung meridian, enhance lung function, and improve the body's disease resistance. In addition, pediatric massage can also promote lymphatic circulation and immune function by massaging the back and abdomen, enhancing the body's immune system.

In short, massage therapy is a unique external treatment of traditional Chinese medicine that can reduce recurrent respiratory infections in children. By stimulating the acupoints of children, it can achieve the effect of alleviating symptoms related to pneumonia in children and enhance the body's immunity.

2.2.3. Acupoint application method

Acupoint application is a traditional Chinese medicine therapy, which puts drugs or dressings on specific acupoints to stimulate the acupoints, promote the circulation of qi and blood, and regulate the body function, so as to achieve the purpose of treating diseases. In the treatment of children's pneumonia, acupoint application can promote the blood circulation and airflow of the respiratory system by stimulating the relevant acupoints, and enhance the disease resistance of the lungs, so as to relieve inflammatory symptoms and improve the cure rate. In the clinical study of Rong Rong Liu et al. [24], 100 patients with bronchopneumonia were randomly divided into treatment group and control group. The control group was treated with conventional drugs, and the treatment group was treated with acupoint application and traditional Chinese medicine on the basis of the control group. The results show that the treatment group patients after obvious curative effect, TCM syndrome integral is significantly reduced, and patients cough, rales disappear and reduce asthma time significantly shorter, prompt acupoint application with traditional Chinese medicine treatment can significantly improve patients cough, cough and phlegm symptoms, shorten the treatment time, the curative effect is significant, improve children with lung function, and improve immunity. In the clinical study by Wang Yusha et al. [25], 72 cases of pediatric pneumonia cough patients according to the random number table method is divided into 2 groups, control group using conventional western medicine treatment, group give western medicine treatment of Chinese medicine acupoint application, 2 groups of clinical curative effect, symptom relief time and symptoms integral Chinese medicine acupoint application treatment of pediatric pneumonia cough clinical effect is good, has certain clinical application value. Studies [26] have shown that on the basis of western medicine treatment, acupoint application treats children with mycoplasma pneumonia, which can not only improve the clinical symptoms of patients, but also effectively reduce the level of serum inflammatory factors and improve the level of immune cells and immunoglobulin.

In short, traditional Chinese medicine application can promote local blood circulation, relieve cough, asthma and other symptoms, and shorten the treatment time. As an auxiliary treatment of children's pneumonia, it is a kind of local application of traditional Chinese medicine, which has certain clinical application value and is worth promoting.

2.2.4. Traditional Chinese medicine enema method

Chinese medicine enema method is to directly input Chinese medicine preparation into the intestine through enema, in order to clear heat and detoxification, regulate the role of qi and blood. In the treatment of children's pneumonia, the Chinese medicine enema method can promote the resolution of inflammation and accelerate the recovery of lung lesions by clearing away heat and detoxifying, moistening the lung and resolving phlegm. Traditional Chinese medicine enema for the treatment of children with pneumonia is commonly used in mulberry white bark, forsythia, *Scutellaria baicalensis*, bitter ginseng and other traditional Chinese medicines, which have the effect of clearing away heat and detoxifying, moistening lung and resolving phlegm. In the process of enema, the Chinese medicine preparation will cover the intestinal wall, through the absorption of the intestinal wall, into the blood circulation, and thus play a role in treating diseases. In the observation of Chinese medicine preserved enema in pediatric pneumonia [27], Wulan et al. gave Ma XingshGan soup to children with phlegm heat closed lung pneumonia, and the results showed that TCM enema can shorten the treatment time and improve the clinical efficacy.

2.3. Precautions for TCM treatment

Although traditional Chinese medicine has a good effect in the treatment of pediatric pneumonia, for pediatric patients, the following aspects should be paid attention to in the application: choosing appropriate Chinese medicine: for different types and causes of pediatric pneumonia, different Chinese medicine prescriptions should be selected to achieve the best treatment effect. Control

dosage: the treatment of children with traditional Chinese medicine needs to avoid adverse reactions caused by overuse of drugs. Individualized treatment: children with different ages of pneumonia, its condition and treatment methods are also different, need individualized treatment, according to the condition and the constitution of children. Prevent cross infection: in the process of treating pneumonia with traditional Chinese medicine, attention needs to be paid to preventing cross infection to avoid the spread and spread of disease. Combined with western medicine treatment: while traditional Chinese medicine to treat pediatric pneumonia, it also needs to combine western medicine treatment to achieve the best treatment effect. Pay attention to diet conditioning: during children's pneumonia, we need to pay attention to diet conditioning, to avoid eating too stimulating food, such as spicy, greasy and other food, and at the same time to ensure adequate nutrition and water intake. Avoid excessive fatigue: During pediatric pneumonia, it is necessary to avoid excessive fatigue and ensure adequate sleep and rest to help the body recover better. Prevention of disease recurrence: the treatment of children's pneumonia needs to pay attention to the prevention of disease recurrence, especially in the seasonal alternation, temperature changes and other susceptible period, need to pay attention to keep warm, strengthen exercise, enhance the body immunity, in order to avoid repeated disease.

3. Summary and outlook

In conclusion, pediatric pneumonia is one of the common respiratory diseases in children, and TCM has certain advantages in its treatment. Current studies show that the treatment of pediatric pneumonia by TCM can regulate the immune function and improve the physique, relieve cough, phlegm and more, fever and other symptoms, shorten the course of the disease, and reduce the occurrence of complications. Commonly used traditional Chinese medicine preparations include heat clearing and detoxification, phlegm and cough, tonic lung nourishing and other prescriptions, such as canopy powder, isatilangen granules, isatilangen granules, children's heat granules, etc. In addition, acupuncture, massage, acupoint application and other traditional Chinese medicine treatment techniques can also be used in the treatment of children's pneumonia. At the same time, in the process of treating pneumonia in children, we should focus on the whole, pay attention to the particularity of the treatment of children, dosage and administration mode, etc.

Although TCM has made some achievements in the treatment of pediatric pneumonia, it still faces some challenges and problems. Further research is needed to study the combination and dosage of TCM prescriptions and explore the best treatment of pediatric pneumonia. Strengthen the joint application of traditional Chinese medicine and western medicine, formulate scientific and reasonable joint treatment plan, improve the treatment effect and safety. The problems of the pharmacological effects, regulatory mechanism and clinical application rules of TCM treatment of pediatric pneumonia were deeply discussed, and the basic research of TCM treatment was strengthened. Strengthen the study of the application of traditional Chinese medicine in pediatric pneumonia, and explore the application effect and safety of traditional Chinese medicine in different types and different courses of pediatric pneumonia. Promote the knowledge and technology of TCM treatment of pediatric pneumonia, improve the public awareness and trust of TCM treatment of pediatric pneumonia, and promote the standardized application of traditional Chinese medicine. In short, TCM has a good curative effect and wide application prospect in the treatment of pediatric pneumonia, and can be used as an adjuvant to conventional treatment to improve the treatment effect and prevent the occurrence of complications. In the future, further in-depth research and promotion are needed to enhance the status and role of traditional Chinese medicine in the treatment of pediatric pneumonia, and to strengthen the standardization and standardized management of traditional Chinese medicine to ensure its safety, effectiveness and reliability.

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