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## Why can Traditional Chinese Medicine not be a new approach to alleviate the symptoms of COVID-19?

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### Abstract

Traditional Chinese Medicine (TCM) has a unique set of therapeutic methods for plagues. COVID-19 is a severe type of pneumonia caused by a new coronavirus, which manifests in fever, cough, headache, fatigue, difficulty breathing, and other symptoms. TCM has fully displayed its advantages of various approaches in this epidemic, including herbal decoction, patent herbs, aroma packets, acupuncture, massage, etc. These methods have played an essential role in the prevention, treatment, and nursing of COVID-19, not only in alleviating the early clinical symptoms of patients but reducing the progression from mild to severe symptoms. Thanks to the advantages of treating the pandemic, we should pay more attention to TCM modalities.

### Keywords

Traditional Chinese Medicine; COVID-19; Chinese herbal injections; Patent herbs; Chinese herbal decoc-

tion

## 1. Introduction

The outbreak of the new coronavirus pneumonia, firstly in Wuhan, China, followed by successive explosions in various global regions, has received much attention that the World Health Organization named it COVID-19 (Corona Virus Disease-9) [1]. COVID-19 is more transmissible and has infected more people than the Middle East Respiratory Syndrome (MERS) in 2015 and the Severe Acute Respiratory Syndrome (SARS) in 2003. Fortunately, China has taken the most comprehensive, strict, and thorough prevention and medical treatment since the outbreak of COVID-19. The epidemic is now well-controlled in the country, and only sporadic cases are reported. Recently, the epidemic has broken out again in several countries worldwide and spread rapidly, posing a significant challenge to the world's public health and safety. By August 2020, more than 20 million new cases have been diagnosed worldwide, with a cumulative death toll of more than 700,000. The number of countries and regions affected by the epidemic has reached more than 200 [2].

Currently, It is known that there are no specific drugs for COVID-19 in western medicine. Typically, interferon-alpha, lopinavir/ritonavir, chloroquine phosphate, and abidrol w/o additional antiretroviral therapy are used. In severe and critical cases, symptomatic support therapy such as respiratory support, circulatory support, and blood purification are given [3]. However, clinical efficiency is not significant, or side effects are commonly seen [4]. On the contrary, TCM showed its advantages in the prevention and care of this new coronavirus pneumonia. It has been reported that the number of moderate to severe COVID-19

patients was significantly reduced with TCM treatment [5]. For severe and critical patients, it can stabilize oxygen saturation and improve dyspnea. Studies have confirmed that TCM can reduce lung and other tissue damage by suppressing the activation of the body's innate immunity, fighting inflammation, and relieving fever [6-7]. In this pandemic, the use of TCM in the prevention and combination with conventional medicine can provide a new way to treatment.

## 2. Data collection

From February to July 2020, publications on COVID-19 were searched from CNKI, WanFang database, and other foreign databases. Also, the real-time news about the outbreak of the pandemic was gathered from the global news website. All information about TCM in COVID-19 was divided into three categories: Chinese herbal decoctions, patent herbal medicine, and herbal injections.

## 3. Results and Discussion

### 3.1 The relationship between plague and COVID-19

According to historical records, from the 7<sup>th</sup> century to the 20<sup>th</sup> century, more than 700 epidemics of plague happened in China, leading to the accumulation of clinical experience in the treatment of epidemics. According to TCM's fundamental theories, COVID-19 can be attributed to epidemic disease. It is mainly located in the lungs and caused by a damp-toxin. In this epidemic, China has set up TCM wards and TCM mobile cabin hospitals. Moreover, TCM has made an irreplaceable contribution to the country in preventing and treating this epidemic.

### 3.2 Various Chinese herbal medicine forms

#### Decoction

As the primary therapeutic approach in TCM, herbal medicine is recommended for the clinical treatment of COVID-19 in the seventh trial state protocol [3]. Qingfeipaidutang (lung clearing and detoxifying decoction) consisted of Ma Xing Shi Gan Tang, She Gan Ma Huang Tang, Xiao Chai Hu Tang, and Wu Ling San, is recommended to promote the function of the lungs, relieve cough, strengthen the spleen, and alleviate stagnation. If a patient is not recovered, another course of treatment can be added. The formula can also be modified to treat other symptoms or underlying diseases of a COVID-19 patient. Withdrawal should be made according to the improvement of symptoms. Clinical studies have shown that the formula has good clinical efficacy in treating COVID-19 with significant improvement in inflammation parameters, clinical signs, and adverse effects [8-10]. In Shanxi and Hebei provinces, the total effective reached more than 90%, including 60% of patients with significant improvement of symptoms and imaging manifestations and 30% with stabilized symptoms. Therefore, the formula effectively prevented the disease's progression from mild to severe symptoms [11]. Compared with antiviral drugs alone, the combination of the formula and drugs significantly shortened the hospitalization period, improved clinical symptoms and CT scanning signs [12]. Modern pharmacology showed that this formula could play a role in balancing immunity function and eliminating inflammation by regulating the protein co-expressed with angiotensin-converting enzyme 2 (ACE2) and a series of signaling pathways [13]. ACE2 is an essential target of SARS-CoV-2 infection, which is consistent with the target of SARS-CoV-infected organisms, and the sequence of SARS-CoV-2 shares a high degree of similarity to SARS-CoV

[14-15]. Furthermore, the formula can exert detoxification, inhibit inflammation, and induce diuresis through the combination of various compounds with ACE2, IL-6R, and AQP4, respectively [16]. The first five main active ingredients of the formula regulate various pathways, including MAPK1, MAPK3, MAPK8, MAPK14, IL-6, RELA, STAT1, TNF, NF- $\kappa$ B, etc., which inhibit inflammatory responses, improve immune function, and protect neurological function [17].

#### Capsule

During this epidemic, Lianhuaqingwen capsule became the most frequently recommended patent herbal medicine in Chinese official protocols [18]. This capsule functions to clear warm pathogens and toxins, protect the lungs, and reduce fever. Clinical applications suggested that it significantly reduces clinical symptoms such as fever, fatigue, cough, and disease progression [19-21]. In a retrospective study, Yao et al. [22] found that the average duration of 42 COVID-19 patients' fever was 1.5 days shorter than those in the control group. Ling et al. [23] found that its main components had a better binding ability with Mpro and ACE2, which might have a therapeutic effect on COVID-19. Wang et al. [24] reported that the medicine might act on inflammatory cytokines and other targets to regulate AGE-RAGE, Kaposi, IL-17, IL-19 through its active ingredients.

#### Injections

Compared with the traditional administration form, herbal injections function faster and show stronger pharmaceutical activity, which can be used as emergency medication in Chinese medicine clinics. Chinese herbal injections play a prominent role in the treatment of patients with severe or critical conditions. In the seventh edition of the national protocol [3], the recommended TCM injections included Xiebijing Injection, Xi-

yanping Injection, Reducing Injection, Tanreqing Injection, Xingnaojing Injection, and so on. As a representative injection for severe community-acquired pneumonia and sepsis treatment, Xiebijing Injection is composed of extracts from Hong Huan, Mu Dan Pi, Chuan Xiong, Dan Shen, and Dang Gui. They can relieve inflammation and inhibit viral replication through multi-component, multi-target, and multi-pathway effects. It promoted medicine absorption and improved the lung infection for common type COVID-19, with a good safety profile [25]. However, the improvement of inflammatory parameters and the nucleic acid conversion rate was not significant [25]. Xiyanning Injection with the anti-inflammatory and antiviral effect is commonly used to reduce fever, clean toxin, relieve cough, and treat dysentery. Its active component andrographis lactone total sulfonate can reduce the level of inflammation, improve cough, fever, lung rales, and other signs, and delay the lung's pathological changes [26]. Reduning Injection contains extracts from Qing Hao, Jin Ying Hua, and Zhi Zi, which can inhibit CVA16, influenza A (H1N1) virus, lung cytomegalovirus, and EV71 virus [27]. Tanreqing Injection treats fever, cough, sputum, and other clinical symptoms caused by phlegm-heat. Besides, it can also be used for COVID-19 patients with mild bacterial infections [28]. Through molecular docking technology, Kong et al. [29] found that the core compound of Tanreqing Injection could exert antiviral effects by binding to SARS-CoV-23CL hydrolase. Thanks to the anti-inflammatory, antioxidant, antispasmodic, wakefulness-promoting, immunomodulatory, hepatoprotective, and neuroprotective effects, Xingnaojing Injection can directly deactivate enteroviruses and induce the production of interferon [30].

### 3.3. Comprehensive TCM measures

TCM has a long history of practices to prevent and

treat epidemics. In treating COVID-19, rich approaches were applied, including moxibustion, acupuncture, meridian massage, etc. Heat-sensitive moxibustion could alleviate the clinical symptoms of COVID-19 [31]. Most patients felt comfortable and relaxed and presented with less negative emotions, which also played an essential role in guiding their mental care [31]. The early stage of COVID-19 is caused by cold and dampness in the upper and middle Jiao, which can be warmed and removed by moxibustion. Therefore, it can be regarded as a preventing method [32]. Acupuncture can promote the balance of the internal environment and accelerate the recovery from COVID-19 [33-34]. Acupuncture treatment Tianzhu (天柱, BL10), Fengmen (风门穴, BL12), Dazhui (大椎, GV14), and Feishu (肺俞, BL13) was effective in treating nasal congestion, runny nose, chills, back and neck aches and pains, etc. of COVID-19 patients; additionally, meridian massage can regulate the respiratory, gastrointestinal, neurology, and endocrine systems and treat emotional disorders [35]. TCM external therapies such as cupping, Guasha, and acupoint patching are also useful for the management of COVID-19 during the rehabilitation period and can be selected according to the individual condition [36].

### 4. Conclusion

With the characteristic of an individualized therapy strategy, long-term efficacy and safety should be further standardized and confirmed. Based on current studies, TCM has shown a favorable therapeutic effect in the treatment of COVID-19, and there are various methods with fewer side effects than pharmaceutical medicine. Therefore, besides improving the clinical efficacy of TCM, it is also necessary to enhance herbal medicine administration and explore the pharmacological mechanisms in-depth, to provide theoretical support for the safe and reasonable use of drugs.

## 5. Conflicts of interest

The authors declare that they have no competing interests.

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