



## How to Deal with Omicron - Traditional Chinese Medicine - Enhance Human Immunity!

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### Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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### ABSTRACT

COVID-19 has been known as the part of "epidemic disease" in TCM (Traditional Chinese Medicine). The reason is that the human body feels the external toxin and pathogen. The pathogenesis is mainly "wet, heat, poison, stasis, deficiency" and the lesions are the principal in the spleen, lungs, and stomach. There are 4 COVID-19 waves in South Africa including ancestral variants, Beta, Delta, and Omicron. Compared COVID-19 cases of the 4 waves and found the admission rate of Omicron was 4.9%, Delta was 13.7%, and Beta was 18.9% ( $P < 0.001$ ). It also found that 28.8% of inpatients of Omicron were critical patients, while critical inpatients of Beta, and Delta were 60.1% and 66.9% respectively ( $P < 0.001$ ). The infectivity of Omicron is ten times that of Delta. Day on Jan 17, 2022, there were about 125 million omicron infections were diagnosed in the world. The current COVID-19 epidemic situation is frustrating. Today there are still no effective vaccines and targeted therapies for the treatment of COVID-19. Fight against the epidemic diseases in China, 90% of confirmed cases have been treated with TCD. TCD can effectively relieve symptoms, shorten the course of the disease, improve the cure rate, reduce the mortality rate, and promote rehabilitation, the total effective rate is more than 90%. This unique system of TCM has opened a new avenue to fight the novel pandemic.

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## 1. INTRODUCTION

“With the spread of Omicron, the number of confirmed cases of COVID-19 is now at record levels in the world, there are around 50 mutations in contrast to the original SARS CoV-2 virus. The Omicron variant is smashing infection across 70 countries, including China. There are many articles in Nature and Cell which report the immune evasion characteristics of Omicron and call it the great escape artist. There are still no effective antiviral drugs, TCD is playing a vital role in the global fight against Omicron by boosting human immunity, and the demand for TCD has increased substantially. The Chinese method has been proven successful” [1-2].

“COVID-19 has had a huge impact on the lives of people around the world in 2019. As of 7 p.m., February 5, 2022, Beijing time, 391,389,079 patients were diagnosed and 5,727,384 patients died. [Data came from the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU) ] (Fig. 1). On 24 November 2021, the new variant B.1.1.529/BA.1 of SARS CoV-2 was reported, which caused great unrest all over the world. Omicron was first detected in a specimen in Botswana on 9 November 2021. The Technical Advisory Group on SARS-CoV-2 Virus Evolution of WHO designated B.1.1.529 as the fifth variant of

concern (VOC), and named it Omicron on 26th November 2021” [3].

Omicron is the most rampant in the world, spreading rapidly in five continents around the world, Estimates build on Institute for Health Metrics and Evaluation models suggest that the number of COVID-19 cases peaked on January 17, 2022. the number of Omicron infections reached about 125 million a day in the world, which is far more than the amount of Delta waves in April 2021, up to 10 times as much as the peak. COVID-19 will continue but the pandemic is ending Authorities announced that South Africa already had passed its Omicron peak without a major spike in deaths on 30 December 2021. “The receptor-binding domain (RBD) of spike protein plays a key role in viral infection and is a key target for vaccines and antibody drugs. Therefore, in order to better understand Omicron's infectivity, vaccine breakthrough, and antibody resistance, the 15 RBD mutations of Omicron should be further studied. Our study reveals that Omicron is approximately 10 times more infectious than the original virus and approximately 2.8 times more infectious than the Delta virus. We demonstrated that Omicron's vaccine escape capability is nearly 14 times greater than that of the Delta variant by using the complex structure of 185 known antibody RBD” [4].



**Fig. 1.** The map of the COVID-19 pandemic (from the COVID-19 Dashboard by the CSSE at JHU)

“The UK government reported that people in England infected with Omicron were about half as likely to require hospital treatment or emergency care as those infected with Delta on 31 December 2021. However, the number of people immunized against COVID-19 by vaccination, infection, or both has increased over time, making it difficult to determine whether Omicron causes milder disease than the earlier variants” [5]. Audrey John said the infection process of Omicron may also affect children, who were specialists in pediatric infectious disease at the Children's Hospital of Philadelphia in Pennsylvania, children's infections are not as severe as that of other age groups, but they can still be severe and can have multiple complications, even in mild cases, there is a risk of prolonged illness and multi-system inflammatory syndrome. Upper respiratory diseases are more severe in children than in adults because babies can only breathe through their nose because of the narrow nasal passages, meanwhile, she said that she had not seen enough data showing an increase in the number of young children hospitalized for severe upper respiratory infections [5].

There are indications Omicron can incur fever, dry cough, and weakness, some people will appear to smell and taste function decline or loss, and a small number of people will also appear nasal congestion, runny nose, sore throat, diarrhea, sometimes smell function decline will also be the first symptom. It also causes vomiting, dehydration, and diarrhea and can exacerbate other health issues such as diabetes. Such cases require less intensive care, but can still overwhelm hospitals. “I heard story after story of hospitals being overwhelmed and health care workers being infected and unable to work.” says Maria van Kerkhove, an epidemiologist of WHO. How severe Omicron is in people who are “immunologically naïve”—neither vaccinated nor previously infected—remains an open question. They are now a minority in most countries, but if they get worse, they can also add to the burden on hospitals. Deaths in Ghana, Ivory Coast, and Madagascar, areas where vaccination rates are low, are rising sharply as COVID-19 cases surge [6].

Surprisingly, a COVID-19 mutation can suddenly acquire a large number of mutations: it can occur in people who are being treated with a particular drug. Some virologists believe there is a risk with the antiviral drug Molnupiravir, which kills the virus by inducing a large number of mutations,

and that it should be removed. Finally, when people are infected with both viruses, there is the potential for SARS-CoV-2 variants to recombine with each other or with other human coronaviruses. There is considerable doubt that Omicron acquired one of the mutations in this way, but there is evidence of recombination between SARS-CoV-2 variants, and possibly complete the immune escape [7]. Immune escape, vaccine effect of Omicron is still under observation and research, no special treatment methods.

COVID-19 has been known as the part of “epidemic disease” in TCM. The reason is that people experience toxins and pathogens from the outside world. The main pathogenesis was “dampness, heat, toxin, blood stasis and deficiency”, and the main pathological changes were spleen, lung, and stomach. For thousands of years, TCM practitioners have accumulated rich experience and played a key role in the prevention and treatment of various epidemic diseases. The General Office of the National Health Commission(NHC) of China and the Office of the State Administration of TCM issued “Diagnosis and Treatment of Pneumonia Caused by Novel Coronavirus Infection”, which embodies the characteristics and advantages of TCM in the prevention and treatment of pneumonia [8].

On Jan 22, 2020, the NHC of China recommends priority treatment of COVID-19 with TCM for the first time, including four syndromes and corresponding formulae in the COVID-19 Diagnosis and Treatment protocol(Trial Version 3). Following Trial Version 8(Apr 14, 2021), the prototype of Huashi Baidu Formula was gradually completed to treat the syndrome of pestilent toxin blocking lung. Simultaneously, the ingredients of Xuanfei Baidu Formula were applied to treat the syndrome of the lung with dampness toxin retention. Based on a large amount of clinical therapeutic evidence, the NHC published the ingredients of Qingfei Paidu Decoction, which was used to treat the COVID-19 patients from mild to critical stages [9].

The combination of nature and humans in TCM can improve human immunity as a whole, and TCM for COVID-19 and Omicron has been widely used in China from the new coronavirus to Omicron, which has been clinically verified. It is a useful method to improve human immunity in the treatment of COVID-19 and Omicron. TCM not only has a long history against epidemic diseases but also plays a significant role in

combating COVID-19. As of March 30, 2020, the TCM therapies were involved in 74 886 confirmed cases, and 92% of the total confirmed cases were recovered. In the TCM-oriented makeshift hospital led by Zhang Boli, an academician of the Chinese Academy of Engineering and honorary president of Tianjin University of Chinese Medicine, no patients developed severe conditions after receiving comprehensive TCM therapies (Chinese herbal medicine, massage, Guasha Scraping, Point application, and exercise of Taiji/BaduanJin). He said at a press conference on epidemic prevention and control in Tianjin on January 11, 2022, that TCM treatment will play a bigger role in this round of treatment Omicron. He pointed out that TCD can obviously lower body temperature and relieve symptoms. According to the new study, the medicine was adjusted to promote lung function and stabilize the blood oxygen saturation and improve dyspnea. Tianjin just announced the "new TCM prevention and treatment plan for COVID-19" to deal with the Omicron variant strain [10].

Xuedong An et al reveal the mechanism of TCM can improve the immunity of COVID-19 patients. The patients often experience specific immune dysfunction, including activation of immune invisibility, paralysis, and memory. Compared with SARS-CoV, SARS-CoV-2 may induce a weaker immune response or "immune invisibility", prolonging the recovery process of patients. For COVID-19 patients and patients with immune abnormalities, TCM can regulate the immune system directly, and can also regulate the immune response by regulating cytokines indirectly. The cyclopeptide Astin C, isolated from *Aster tataricus* L. f., specific inhibition of immune-related connector protein STING (stimulator of interferon genes) to modulate the immune response. The rich triterpenoids in *Glycyrrhiza uralensis* Fisch., *Dioscorea oppositifolia* L., *Poria cocos* Wolf, and *Polyporus* are used as steroid hormones to regulate the activity of the mammalian immune system. Kaempferol and methanone can also help to treat COVID-19 directly through an immune response.

Maxing Shigan decoction regulates immune processes such as leukocyte activation, T cell differentiation, and acute responses, and tends to restrict pro-inflammatory cytokines and control myeloid cells through the above cell differentiation molecules. Da Yuan Yin can modulate the activation of T and B cells to convey information and exert immune response

by regulating IL-6 and C-C motif chemokine 2 [11].

On the basis of available clinical data, TCM has shown four clinical advantages in COVID-19 treatment. First, for mild and moderate cases, it can significantly shorten the negative transformation time of SARS-CoV-2 nucleic acid, the median duration of fever, the time of defervescence, and reduce the occurrence of severe and critical diseases. Second, for severe and critically ill patients, TCM injections can stabilize oxygen saturation, inhibit inflammatory responses, reduce exudative lesions, block or inhibit cytokine storms, and reduce the use of supportive care and antibiotics. Third, for patients in the convalescent period, it can improve symptoms, speed up recovery, alleviate lung inflammation, reduce adhesion, and help restore the function of damaged organs. Finally, it can significantly reduce the cost of treatment [12].

The Omicron variant spreads more easily than the original virus and the Delta variant cause COVID-19. The CDC experts believe that people infected with Omicron can spread the virus to others even if they are vaccinated or have no symptoms. People infected with the Omicron variant can experience symptoms similar to those of the previous variant. The presence and severity of symptoms can be influenced by COVID-19 vaccination status, presence of other health conditions, age, and previous infection. Omicron infection causes generally milder disease than infections with previous variants. Preliminary data suggest that Omicron may cause milder disease, although some people may still have severe illness that requires hospitalization and may die due to severe complications. Even though only a fraction of patients with Omicron infection requires hospitalization, a great many cases can destroy healthcare systems, which is why it's important to take steps to protect yourself. Against Omicron, wear a mask and quarantine one meter. Wash your hands can save lives. Homologous and xenogeneic booster vaccines have an acceptable safety profile and are immunogenic in adults who completed a primary COVID-19 vaccine program at least 12 weeks ago. We also have Chinese medicine. Because Chinese medicine has proven effective against Omicron. In particular, the clinical application in Tianjin has proved that TCM has a positive role in fighting virus infection. The integrated whole process of TCM early and in-depth interventional treatment and rehabilitation, the integrated management of the

ward, and the full coverage of TCM prevention, have brought their own characteristics and advantages into each stage, the TCM experts have worked closely with western medicine experts to create a treatment system with local characteristics. It proved that in the prevention and control of Omicron, TCM is not only targeting the virus but also focuses on regulating patients' body functions and improving human immunity [13].

“Three formulae and three medicines have been shown to be effective in Omicron patients and recommended in the prevention and control of the epidemic worldwide, including Jinhua Qinggan granules, Lianhua Qingwen capsules, Xuebijing injection, Qingfei Paidu decoction, Huashi Baidu decoction, and Xuanfei Baidu decoction. After routine treatment with Lianhuaqingwen, symptoms such as fever, fatigue, cough, chest tightness, and loss of appetite improved rapidly, and mild and moderate cases were rehabilitation” [14-15]. “At the same time, we found that Lianhuaqingwen could inhibit the replication of SARS-CoV-2, affect the viral morphology, and exert anti-inflammatory activity in vitro” [16]. “Jinhua Qinggan improves the common clinical symptoms of patients, and also can relieve their psychological anxiety” [17]. “Studies have shown that the active ingredients of Jinhua Qinggan regulate various signaling pathways through binding with ACE2, and then act on the targets including PTGS2, HSP90AB1, HSP90AA1, PTGS1, and NCOA2 and thus help prevent COVID-19” [18]. “In the treatment of severe and critically ill patients, clinical studies have shown that the combination of Xuebijing injection and western medicine has improved the recovery and discharge rate of COVID-19 patients and reduced the incidence of severe patients from deterioration to critical illness. The experimental results showed that the formulation had an antiviral effect in vitro, it also showed that the formulation had an obvious inhibitory effect on inflammatory factors caused by SARS-CoV-2 infection. In addition to reducing inflammatory responses and preventing cytokine storms, Xuebijing also has anti-thrombotic effects and can prevent vascular embolism caused by COVID-19. Huashi Baidu decoction can be used as an effective multi-target comprehensive treatment for SARS-CoV-2 positive patients, and can significantly shorten the time for nucleic acid to turn negative. Furthermore, it can shorten the average length of hospitalization and significantly improve clinical symptoms, which can be found

by physical and chemical examination and pulmonary CT imaging studies. In addition, Huashinbaidu reduced the viral load in lung tissues by 30% in a mouse model. For severe COVID-19 patients, Qingfei Paidu decoction can quickly and effectively relieve fever, cough, and fatigue, and improve pulmonary disease outcomes. An imaging examination confirmed the change in pulmonary pathogenesis. Xuanfei Baidu formula can effectively shorten the improvement time of clinical symptoms and peak temperature. It also reduced the average length of hospitalization for mild and moderate patients to a certain extent and prevented the worsening of symptoms. This formulation can improve immunity, alleviate inflammatory cytokine storms, reduce viral protein transcription, regulate hepatobiliary metabolism, and restore energy and metabolic balance of the body” [19-20].

## 2. CONCLUSIONS

The outbreak of COVID-19 for more than two years, TCM has been useful as a branch of alternative medicine, offering several strategies for fighting the deadly disease, owing to its ancient and experienced history of fighting the epidemic and its unique treatment system. TCM treatment based on syndrome differentiation is the first-line treatment for patients with mild and moderate symptoms of COVID-19. Extensive clinical data and observations show that the active use of TCM has effectively prevented the spread of COVID-19 in China, reflecting the strengths of China's unique healthcare system. The current global epidemic situation is discouraging. In the absence of effective vaccines and targeted therapies, this unique system of TCM opens up a new way to fight COVID-19. It is an effective and feasible method to use TCM to enhance immunity to help eliminate Omicron.

## CONSENT AND ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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