

Analysis of the Pharmacological Mechanism of Herbal Medicine in the Treatment of COVID-19

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Abstract

The COVID-19 coronavirus, which originated in 2019, caused a global pandemic in 2020. In the course of combating COVID-19, herbal drugs have achieved certain effects. My research found that the pharmacological mechanism of botanical drugs in the treatment of COVID-19 is that the alkaloids, volatile oils, and polysaccharides contained in plants have a broad-spectrum antiviral and broad-spectrum antifungal effect. A combination of multiple herbal drugs can kill the invading body COVID-19 and suppress its own immune over-reaction or inhibit the infiltration of leukocyte inflammation, quell the war between the two sides, so as to achieve the purpose of treatment.

Keywords: COVID-19, Cryptococcus, candidiasis, leukocyte, alkaloid, volatile oil, polysaccharide

We are often exposed to coronaviruses in our daily lives because they are prone to common diseases and colds. Human knowledge of coronaviruses that can infect humans began in 1965. That year, the Common Cold Research Unit in the United Kingdom discovered a new virus that caused the common cold. This virus was later named HCoV-OC43, which was the first human coronavirus to be isolated. Through this study, humans have discovered for the first time that viruses can also cause colds, and there are more than 100 common cold pathogens. The vast majority of colds are caused by rhinovirus and coronavirus. 10% of common colds are caused by human coronavirus. Unfortunately, until now, humans have not found a way to prevent and treat common colds. In this regard, Tyrrell himself wrote in the memoir of Cold Wars: The Fight against the Common Cold: "When we discovered that the common cold was caused by hundreds of different viruses, we soon realized that it is impossible to develop a vaccine. Although reluctantly, we have to understand that a common cold cannot be avoided. "Tyrrell also pointed out that the common cold caused by human coronavirus and rhinovirus is a self-limiting disease, that is, the immune system can help you without taking medicine. Because for healthy people with normal immunity, coronavirus will only cause mild symptoms [1].

Before the outbreak of severe acute respiratory syndrome (SARS coronavirus) in 2003, no one knew that coronavirus was so contagious. Ten years later, the Middle East Respiratory Syndrome caused by the MERS coronavirus made humans recognize the infectivity and severity of coronaviruses again. The COVID-19 coronavirus pandemic, which has been circulating in Wuhan, China, since December 2019, has spread to the whole world, causing 4.5 million infected patients worldwide and 300,000 deaths. Coronaviruses are a large class of viruses with

a spherical shape. The outer part of the ball is covered with elongated or filamentous spikes, like a ball wearing a crown, so it is named coronavirus.

The single-cell pathogenic fungi are *Candida* and *Cryptococcus*. *Candida* belongs to the order of yeasts and yeasts in the taxonomy of fungi. At least 300 species have been found so far. The common feature is that the cells are spherical, oval, and sometimes irregular. *Candida albicans* has a cell wall and a nucleus, and is spherical or oval, and reproduces by budding. *Candida albicans* cells can have different morphologies, sometimes round like yeast, sometimes elongated hyphae. For the invading tissue, the form of mycelium is necessary [2].

Cryptococcus is classified in the order of fungi taxonomy of subspecies, subfamily, spores, cryptococcosis, and there are currently more than 70 species known. The pathogenic bacteria are mainly *Cryptococcus neoformans*, and *Cryptococcus paleo coccus*, *Cryptococcus albicans* and *Cryptococcus rolens* have been reported to cause human diseases. The main routes of infection are the respiratory tract and gastrointestinal tract, which mainly invade the central nervous system, lungs, and bones, causing high fever, severe prognosis, and high mortality. Most AIDS patients have *Cryptococcus neoformans* infection, and the early symptoms of AIDS are similar to colds. *Cryptococcus neoformans* is generally round or oval, and *Cryptococcus neoformans* varieties are needle-shaped, rod-shaped, and fusiform. The genus *Ottomyces* in the order Entomophthora includes *C. coronatus* [2].

According to the study of Physiology, white blood cells have nuclei, which are generally spherical in the blood, and have different degrees of deformation in the tissues. The main function of white blood cells is to defend and participate in the body's reaction to invading foreign bodies. According to the study of Pathology, leukocyte exudation is an important morphological feature of the inflammatory response. The process of various leukocytes leaking out of the blood vessel through the blood vessel wall is called leukocyte exudation. The exuded leukocytes are called inflammatory cells. The phenomenon that inflammatory cells gather in the inflammation area is called inflammatory cell infiltration.

I have studied the shapes of COVID-19, *Candida albicans*, leukocytes, and *Cryptococcus neoformans*, and found that their shapes are similar. The shape of COVID-19 is a spheroid body covered with elongated or filamentous spines. It is also white under the microscope. When *Candida albicans* invades the tissue, it is also spherical in shape with filamentous spines. White blood cells are in the blood. It is generally spherical in shape, and has varying degrees of deformation in the tissue. The exuded leukocytes protrude from the pseudopodia at the junction of endothelial cells. The morphology under the microscope is also like a spherical ball with filamentous spines. *Cryptococcus neoformans* Can be deformed into needle-shaped, there are *Cryptococcus albicans*.

My research on the clinical symptoms of COVID-19 and *Cryptococcus neoformans* found that there are many similarities between the clinical symptoms of COVID-19 and *Cryptococcus neoformans*, and fatigue, sore throat, cough, joint pain, high fever, headache, loss Taste or

smell, nausea, vomiting and other symptoms. They all destroy the immune system and spread to systemic infections with the blood. They are all spherical in shape, the virus structure contains a single nucleic acid (DNA or RNA) type, Cryptococcus is also a single cell structure, containing DNA and RNA. Their physiological characteristics are also the same. They are afraid of heat or cold. They can be suppressed or killed at 50 to 60 degrees, and they can survive in a state of low temperature and hypoxia. I think that the classification of pathogens in modern medicine also overlaps. For example, influenza viruses (various types of HN avian influenza) are highly consistent with fungal histoplasma, and Corona aureus is also a coronary morphology. Therefore, I believe that COVID-19 has the characteristics of a large family of cryptococcus.

Cellular immunity has always been considered to be dominant in combating *Candida albicans* infection. Long-term clinical observations have found that the vast majority of invasive *Candida* infections occur in individuals with impaired cellular immune function, and AIDS patients are prone to oral *Candida albicans* infections. Humoral immunity is the main component of the body's immune defense system, but the role of humoral immunity in *Candida albicans* infection has been a topic of debate. Some experiments have denied the protective role of humoral immunity against *Candida albicans* infection. For example, in patients with leukemia who died from *Candida albicans* infection, the titer of anti-*Candida albicans* antibody in serum has increased significantly, and B-lymphocyte defects have little effect on the protective immunity of *Candida albicans* [2].

Modern medicine believes that *Candida albicans* is one of the parasitic flora of the human body or host, is a conditionally pathogenic bacteria, and is a resident parasitic fungus of the human respiratory, gastrointestinal and urogenital systems. *Candida albicans* in the skin and mucous membranes can lead to osteomyelitis. Systemic disseminated infection of *Candida albicans* can occur in patients with neutropenia or leukemia, patients receiving antibiotics or chemotherapy, and major abdominal surgery.

Candida albicans is a conditional pathogen, a resident parasitic fungus in the human respiratory, gastrointestinal, and urogenital systems. Leukocytes are also normally present in the blood or tissues. When a trigger occurs, they all show an inflammatory response. Leukocytes in the blood of leukemia patients increase significantly, and leukemia patients often die from *Candida albicans* infection. And the shape of white blood cells and *Candida albicans* are also highly similar, are nucleated single cells, *Candida albicans* cells are spherical, candidal mycelium morphology and white blood cells with pseudopodia are also like coronavirus. The function of white blood cells is to defend and participate in the body's response to invading foreign bodies. The exuded white blood cells are called inflammatory cells and cause inflammation infiltration. From the invention of penicillin, it can be concluded that mold has the effect of engulfing other pathogens, and humoral immunity can suppress other pathogens, but it has no inhibitory effect on *Candida albicans* infection. Therefore, I believe that white blood cells belong to the *Candida* family.

I think that the germ world has characteristics similar to those of kingdoms, the host is their territory, the fungus is the ruling class, and *Candida albicans* is the king. The various white blood cells in the blood are like a Legion of *Candida*. When foreign bacteria invade, *Candida albicans* in the body will spontaneously organize forces to resist the invaders in order to maintain its dominance, namely "rejection reaction" or "immune reaction". When the invading bacteria are more powerful, the two sides will have a fierce battle. This is an overreaction of the immune system, which causes a large number of white blood cells (*Candida albicans*) in the blood to proliferate. A large number of *Candida* infections cause serious damage to the host and even death.

The COVID-19 coronavirus has similar properties to *Cryptococcus*. When COVID-19 invades the human body, normal white blood cell strength cannot prevent COVID-19 invasion, and COVID-19 damages the immune system. In order to enhance the resistance of white blood cells, it can induce a large amount of *Candida albicans* in the body, form a systemic inflammatory infiltration, and induce a systemic disseminated infection of *Candida albicans*. The more intense the battle between COVID-19 and leukocytes, the more intense the infiltration of *Candida albicans*, and the stronger the destructive power of COVID-19, resulting in accelerated death of the patient.

Aspergillus is a potent carcinogen, and consensus has been reached. There are still many debates on the carcinogenic factors of *Candida*. Dr. Tulio Simoncini, an Italian oncologist and author of "Cancerisa Fungus" (*CancerisaFungus*), believes that cancer is a fungal disease, and the cancer is a fungal infection caused by *Candida*, especially Different histological reactions caused by *Candida albicans*. I very much agree with him, because cancer is a chronic invasive inflammatory reaction of *Candida albicans*. When the invading germs are severe, the two sides fight fiercely, and the patient will die quickly. But when *Candida* wins and the excessive immune response is controlled, the patient will enter various chronic disease states, but the host will eventually die because of the chronic systemic disseminated infection of *Candida*.

The extraction of effective chemical ingredients from plants originates from modern western medicine. Many scholars at home and abroad have found that alkaloids have many pharmacological activities, including anti-tumor, anti-virus, anti-inflammatory, antibacterial, analgesic, liver protection, cardiovascular effects and many other aspects. However, the pharmacological mechanism of anti-tumor, anti-virus, anti-inflammatory, antibacterial, analgesic, liver protection, and cardiovascular effects of alkaloids in the medical community has not been fully studied. Also, because the pharmacological mechanism of alkaloids has not been studied clearly in the prior art, and the synergy between various alkaloids is unclear, the existing chemicals are all single alkaloids contained in single-flavor plants. The disadvantage of a single alkaloid drug is that the amount of alkaloid used is too large, and it is easy to produce toxic and side effects.

Modern pharmacological experiments on volatile oil have shown that volatile oil has anti-inflammatory, anti-allergic, anti-microbial, anti-mutation and anti-cancer, anthelmintic

effect, enzyme inhibitory effect, effect on central nervous system, effect on respiratory system, etc. However, the understanding and research on the active mechanism or pharmacological mechanism of volatile oil is still very limited. Modern research has also found that some volatile oils can inhibit fungi.

Inspired by Zhang Yuan, a famous doctor in the Jin Dynasty, "The Headache Case", research on traditional Chinese medicine believes that *Candida albicans* belongs to "wind evil, wet evil, cold evil" in traditional Chinese medicine, and COVID-19 or cryptococcus belongs to "Wind evil, wet evil, hot evil. " Therefore, the anti-wind medicine, anti-humidity medicine, anti-cold medicine or heat-clearing medicine in traditional Chinese medicine have antiviral and antifungal effects. I was inspired by the characteristics of the fungi like acid and alkali, and concluded that the alkaloids contained in the plant raw materials have antifungal effects, and inspired by the traditional Chinese medicine "aromatic dampness, spicy to dampen, warm to cold", The volatile oil contained in the raw material medicine of the plant also has an antifungal effect. Modern pharmacological studies have also proven that alkaloids, volatile oils, and polysaccharides have antiviral, anti-inflammatory, and anti-cancer effects. Therefore, the pharmacological mechanism of botanical drugs in the treatment of COVID-19 is that the alkaloids, volatile oils, and polysaccharides contained in the plants have broad-spectrum antiviral and broad-spectrum antifungal effects. A combination of multiple botanical drugs can kill COVID-19. It can also inhibit *Candida albicans* or white blood cell's own immune over-reaction or inhibit the inflammation and infiltration of white blood cells, quell the war between the two sides, so as to achieve the purpose of treatment.

Because of the difference in chemical composition of alkaloids, volatile oils, and polysaccharides contained in various plant medicines, various alkaloids, volatile oils, and polysaccharides have common antiviral and antifungal properties, but they have characteristics and have different targeting effects Therefore, various botanical drugs should be used selectively according to different clinical symptoms. Medicine and food are homologous. Due to the limitation of natural conditions, ancient medical practitioners called plants that can be directly eaten as food, and plants that were not directly eaten as medicine. Modern nutrition has also proved that many vegetables, fruits, nuts such as sweet potatoes, potatoes, taro, garlic, onions, pumpkin, tomatoes, peanuts, coriander or spices have medicinal value. The pharmacological mechanism of vegetables, fruits, and nuts is also that the alkaloids, volatile oils, and polysaccharides they contain have broad-spectrum antiviral and antifungal effects. Therefore, "self-limiting disease" is not mainly the immune function of lymphocytes, but the vegetables, fruits, nuts, vegetable oils, salt, sugar and other foods we eat daily can inhibit or kill invading viruses or suppress whiteness in the body. *Candida* over proliferates. Therefore, a reasonable diet is also an important method to resist disease.

In the course of treatment against COVID-19 in 2020, the comprehensive treatment of COVID-19 using traditional plant medicine decoction + chemical drugs and other treatments has achieved good therapeutic effects. Moreover, it has been proved that the traditional botanical

decoction can play a relatively good effect on mild patients, and it also proves that the combined effect of multiple botanical drugs is significantly higher than that of a single drug.

Compared with the existing chemicals that are made from single plant alkaloids, I believe that the use of a mixture of multiple alkaloids can reduce the content of a single alkaloid in the drug and reduce the single alkaloid due to excessive consumption. The resulting toxic reactions can also improve drug resistance. Because of the synergistic effect of various alkaloids, it can more effectively target different clinical symptoms caused by viruses or fungi, and it is also more resistant.

I think that the technical solution of combining alkaloids, volatile oils, and polysaccharides contained in various plant medicines has obvious advantages, that is, it absorbs the advantages of the combination of multiple plants in ancient traditional medicine, and absorbs the advantages of modern chemical medicines. In addition to the shortcomings of the ancient traditional classics that are not clear about the effective chemical composition, it also overcomes the shortcomings of modern western medicine with a single chemical composition that is prone to side effects, toxic reactions and drug resistance.

Reference

[1] Cold Wars: The Fight Against the Common Cold

[2] Medical mycology, Hai Wen