



Clinical Study on the Coinfection of Coronavirus Disease and Influenza A by the Treatment of Traditional Chinese Medicine and Western Medicine

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Abstract

This article is about the coinfection of 2019-nCoV and influenza A virus, secondary mycoplasma pneumonia infection. The patient has the primary disease of kidney stones, which belongs to the high-risk group. By the treatment of Traditional Chinese Medicine (TCM) and Western Medicine, the result showed that although Western Medicine can effectively remove influenza A virus and Mycoplasma pneumonia, it is not effective against 2019-nCoV. Finally, the treatment of TCM based on syndrome differentiation was used to effectively remove the 2019-nCoV, effectively prevent the occurrence of cytokine storms, and successfully cured this case of coronavirus disease. Simultaneously, to explore the pathomechanism of TCM and Western Medicine, to analyze the susceptible constitution, "preventing a change of disease", to prevent the transition to critical and critical illness, and to reduce mortality. It is of great significance to promote the treatment of TCM and Western Medicine to defeat the coronavirus disease in the whole country in the future.

Keywords

Coronavirus disease (COVID-19)
Influenza A virus
Constitution

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1. Introduction

The Coronavirus disease raged in the world in 2019. The epidemic situation had spread to the Yan'an area, resulting in COVID-19^[1]. This case was mixed with influenza infection and complicated by Mycoplasma pneumonia infection. After receiving the diagnosis, the hospital actively adopted an integrated traditional Chinese and Western medicine treatment and successfully cured the disease. The results of the combined treatment between China and the West are introduced as follows, to better explore the mechanism of traditional Chinese and Western medicine for readers.

Case introduction: the patient, male, 22 years old, Wuhan school student, Yan'an City, Shaanxi Province, Ansai District. On January 15, 2020, the patient had cough and expectoration during his study in Hongshan District of Wuhan City, showing irritating dry cough, not much sputum, white sticky phlegm, no obvious shortness of breath and discomfort, no fever, chills, no dizziness, headache, no nausea, vomiting, no abdominal pain, diarrhea, no panic, shortness of breath, food and sleep, normal stool and no treatment. On January 21, when the patient left Wuhan and returned to Yan'an, he felt febrile, accompanied by fatigue, dry throat, and an obvious runny nose. After arriving in Yan'an on the afternoon of January 22, the patient complained to the Emergency Department of Affiliated Hospital of Yan'an University with "cough, expectoration for eight days, and fever for one day." The body temperature showed 38.7 °C, and the emergency chest CT showed that: 1. Glass shadow in the left upper lobe of the lung. 2. Fracture of the second rib's front end on the right 3. The scanning range showed left kidney stones. The nucleic acid test of the pharyngeal swabs virus showed that it was positive. Consider pulmonary infection: COVID-19? To clear away heat and detoxify, support symptomatic, anti-infection treatment. For further diagnosis and treatment at 7: 30 on January 22, Yanda escorted 120 affiliated patients to Yan'an Second People's Hospital, as follows: "1. Pulmonary infection with COVID-19, mycoplasma pneumonia. 2. Influenza A virus infection. 3. Left kidney stone "received hospital treatment. Body examination: body temperature 36.0 °C, pulse 76 times/min, breathing 21 times/min, blood pressure 130/87mmHg, lip color ruddy, pharyngeal congestion obvious, no tonsil enlargement. The breathing sounds of both lungs were thick, no obvious dry and wet rale,

no pleural friction, rhythm, heart sound, no pathological murmur, a flat abdomen, no tenderness, and rebound pain in the whole abdomen. Auxiliary examination: respiratory tract four items: RSV-IgM negative, Fiu-IgM: negative, Ady-1 IgM: negative, mycoplasma pneumonia MP-1 IgM: positive. Blood routine: WBC $6.59 \times 10^9/L$, NEU 68.4%, LYM 18.7%, MONO 12.4%, EOS # 0.2%, MONO # $0.82 \times 10^9/L$, EOS # $0.01 \times 10^9/L$, RBC $4.97 \times 10^{12}/L$, HB 149g / L, PLT $146 \times 10^9/L$, PCT 0.14%. CRP: 12.49mg/L increased. Hs-CRP: > 5.0mg/L increased. The coagulation series showed: PT 12.7sec, FDP $6.44 \mu g \leq ml$, D-Dimer 1.99mg/L. The influenza A virus's nucleic acid was positive, CRP:14.4mg/L, hs-CRP: > 5.0mg/L, blood routine, biochemistry, coagulation series, erythrocyte sedimentation rate, and procalcitonin were normal, and the type B influenza virus nucleic acid was negative. Throat swabs were positive for NCP virus nucleic acid. Chest CT showed: 1. Glass shadow in the left upper lobe of the lung. 2. Fracture of the front end of the second rib on the right 3. The scanning range showed left kidney stones. Admission diagnosis: 1. COVID-19 2. Influenza A virus infection 3. Left kidney stone.

After admission, oxygen inhalation, respiratory tract isolation, intravenous drip of phlegm-heat clearance 20 ml/day, oral Ganke Shuangqing capsule 0.6 g, twice a day, clearing away heat and detoxification and relieving cough, oral administration of Lopinawetonavir tablets two tablets, twice a day, oseltamivir phosphate 75 mg, twice a day, antivirus, intravenous infusion of levofloxacin 0.4 g, once a day anti-infection, acetylcysteine solution 0.3 g, twice a day, atomized inhalation of expectoration, 2 times a day, two times a day. Energy mixture intravenous drip nutrition support and symptomatic treatment, and given psychological guidance, the patient's body temperature gradually decreased. On January 26, body temperature dropped to normal, symptoms gradually improved, but on January 28, symptoms aggravated, cough more frequent and violent, a small amount of white mucus sputum, easy to cough, no chest tightness, shortness of breath, no runny nose, sneezing, no dyspnea, no abdominal pain, diarrhea and other symptoms, body temperature fluctuated between 37 °C and 37.9 °C. There were two ulcer surfaces about 0.2 and 0.3cm near the left maxillary pharyngeal and palatal arch, poor food intake, and poor sleep at night. Chest CT showed that the original lesions of the left upper lobe of

the left lung were enlarged, and the density was higher than that of the former. There are many new infectious lesions in both lungs. The nucleic acid of the influenza A virus turned negative; mycoplasma antibody MP-IgM was negative; CRP: 14.4 mg/L, hs-CRP: > 5.0 mg / L; erythrocyte sedimentation rate: 22 mm/h; continued treatment with antiviral, anti-infection, clearing away heat, and detoxification, and resolving phlegm. The symptoms were repeated, and the relief was not obvious.

On January 31, Chinese medicine should enter the isolation ward for consultation: symptoms such as front, left zygomatic bone red, eyebrow too long, tongue light red, fur white and greasy, pulse slippery and big, the disease belongs to the category of "epidemic disease" of Traditional Chinese Medicine, the condition is located in the lung and spleen, syndrome belongs to cold and dampness attack lung hindering the spleen, has the sign of heat, has not yet injured yin, the treatment should Xuanfei stop coughing, remove dampness and avoid filth, strengthen the blood circulation. The prescription was supplemented with Qianhu Zhike Powder: Jingjie (*Herba Schizonepetae*) 10 g, Jiegeng (*Radix Platycodi*) 10 g, Ziwan (*Radix Asteris*) 30 g, Baibu (*Radix Stemonae*) 10 g, Chen Pi (*Pericarpium Citri Reticulatae*) 10 g, Huangqin (*Radix Scutellariae*) 10 g, Qianhu (*Radix Peucedani*) 10 g, Zhebeimu (*Bulbus Fritillariae Thunbergii*) 10 g, Rugen (*Rhisoma Phragmitis*) 10 g, xingren (*Semen Armeniacae Amarum*) 10 g, Guarou (*Fructus Trichosanthis*) 30 g, Taoren (*Semen Persicae*) 10 g, Yuxingcao (*Herba Houttuyniae*) 30 g, Cangzhu (*Rhisoma Atractylodis*) 20 g, Caoguo (*Fructus Tsaoko*) 10 g, Mahuang (*Herba Ephedrae*) 5 g, Pipaye (*Folium Eriobotryae*, wrapped) 30 g, Xianhecao (*Herba Agrimoniae*) 50 g, Puhuang (pollen *Typhae*, wrapped) 15 g, Shuizhi (*Hirudo*) 6 g, Zhigancao (*Radix Glycyrrhizae*, roasted) 6 g. Prepare a decoction with one bag of herbs per day. Decoct with water. The resulting liquid should be taken warm in three divided doses (morning, noon, and evening), 30 minutes after meals. The total course of treatment is three days. At the same time, one dose of the water-soluble vitamin was given intravenously, and thymosin 80 mg/ for injection was given intravenously once a day to improve the immunity of body. The body temperature dropped to normal on February 2, and the cough gradually improved. On February 2, a novel coronavirus NCP nucleic acid test of nasopharyngeal swabs and oropharynx swabs in the

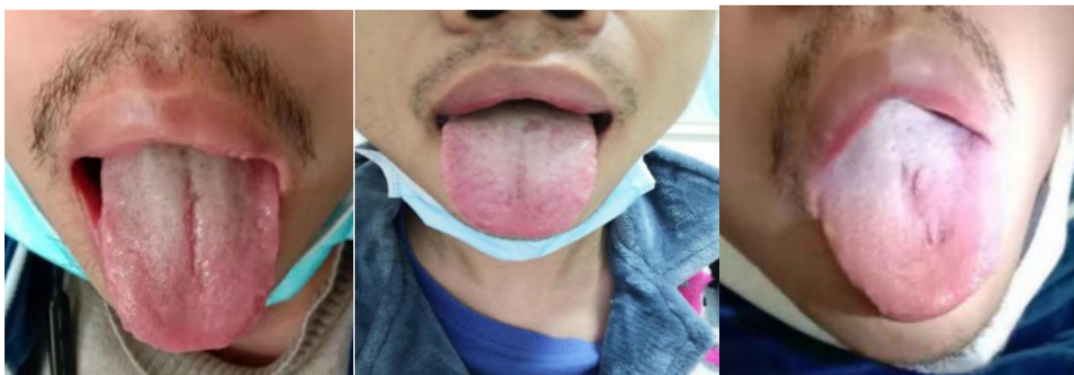
hospital was still positive. Chest CT: the lesions of the left upper lobe and the dorsal segment of the lower lobe were absorbed, and partial density decreased; the local lesions of the dorsal segment of the left lower lobe of the left lung were fibrotic. The lesions of the basal segment of the right lower lobe of the right lung were enlarged.

On February 3, the patient asked for a consultation with Traditional Chinese Medicine again: the cough was obviously improved in the past three days, no fever, the ulcer surface of the upper jaw was reduced, the skin was thick, the tongue was red, mossy white, and greasy, and the number of veins was slippery. The absorption of CT infection lesions in the chest was obvious. So, the doctors delete Rugen (*Rhisoma Phragmitis*), Qianhu (*Radix Peucedani*), and increase Daqingye (*Folium Isatidis*), Jinyinhua (*Flos Lonicerae*). The new prescriptions are as follows: Jingjie (*Herba Schizonepetae*) 10 g, Jiegeng (*Radix Platycodi*), Ziwan (*Radix Asteris*) 30 g, Baibu (*Radix Stemonae*) 10 g, Chen Pi (*Pericarpium Citri Reticulatae*) 10 g, Baiqian (*Rhizoma Cynanchi Stauntonii*) 10 g, Zhebeimu (*Bulbus Fritillariae Thunbergii*) 10 g, Xingren (*Semen Armeniacae Amarum*) 10 g, Guarou (*Fructus Trichosanthis*) 30 g, Taoren (*Semen Persicae*) 10 g, Yuxingcao (*Herba Houttuyniae*) 30 g, Cangzhu (*Rhisoma Atractylodis*) 20 g, Caoguo (*Fructus Tsaoko*) 10 g, Mahuang (*Herba Ephedrae*) 5 g, Pipaye (*Folium Eriobotryae*, wrapped) 30 g, Xianhecao (*Herba Agrimoniae*) 50 g, Daqingye (*Folium Isatidis*) 15 g, Huangqin (*Radix Scutellariae*) 15 g, Shuizhi (*Hirudo*) 6 g, Jinyinhua (*Flos Lonicerae*) 15 g, Puhuang (pollen *Typhae*, wrapped) 15 g, Zhigancao (*Radix Glycyrrhizae* roasted) 6 g. 4 pay, water decoction take the old dose, take it three times in the morning, middle and evening. The chest CT was reexamined on February 5: the lung lesions had absorbed before, and a few lesions were fibrosed. Novel coronavirus nucleic acid test of nasopharyngeal swabs in our hospital: negative, anal swabs novel coronavirus nucleic acid test: positive.

On February 5 and February 7, the CDC reported that the novel coronavirus NCP nucleic acid test of nasopharyngeal swabs was negative and lasted three times. The patient occasionally has a cough, no phlegm, no fear of cold, fever, no chest tightness, shortness of breath, no dyspnea, no abdominal distension, diarrhea, and another special discomfort, and normal body temperature. The

pharynx of the body was not red, the ulcer surface of the left upper jaw was smaller than that of the front, and the tonsil was not enlarged. No dry and wet tremors and pleural friction sounds were detected in both lungs, and no abnormalities were found in the heart and abdomen. The chest CT lesions were significantly absorbed on February 8. According to the “novel coronavirus infection pneumonia diagnosis and treatment plan (fifth trial edition),

meets the discharge standard. On February 8, reports to the Yan’an City Health and Health Commission for approval to go through the discharge formalities. Discharge diagnosis: 1. COVID-19, 2. Influenza A virus infection, 3. Left kidney stone. On February 13, the patient revisited, and the symptoms completely disappeared, and the focus of pulmonary infection was basically absorbed.



A

B

C

Figure 1. Tongue image: A, B, C are the tongue coating before, after treatment, and after discharge, respectively

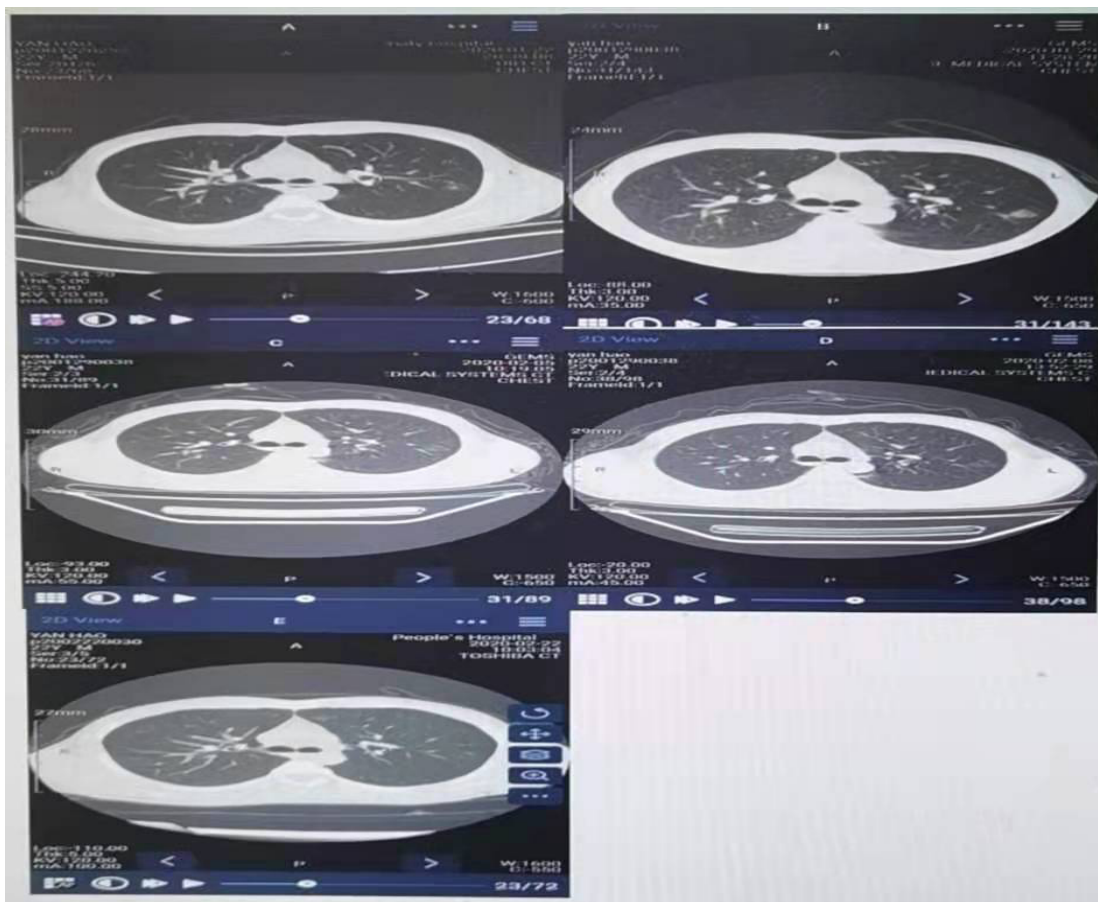


Figure 2. Chest CT: A, B, C, D, E are chest CT images on January 22, January 29, February 5, February 8, and February 22, respectively

2. Result

The tongue image and chest CT are shown in **Figures 1** and **2**, respectively.

3. Discussion

COVID-19 belongs to the category of “epidemic disease” in Traditional Chinese Medicine. Wu Jutong’s “differentiation of epidemic febrile diseases” states: “When the wind wood of Jueyin year is controlling the weather, the people are feverish and feverish.” Abnormal climate change, resulting in the production of epidemic poison gas^[2]. “The five diseases are easy to infect; without asking the size of the disease, the symptoms of the disease are similar.” “Avoid its poison gas, the sky female never”^[3]. It is suggested that the disease is mainly transmitted through the respiratory tract, in order to inhale the poison gas of the epidemic disease and enter the condition through the mouth and nose. Because of feeling the breath of epidemic toxin, the disease is located in the lung and spleen, and the pathogenesis is characterized by “dampness, heat, poison, and stasis.” According to the differences in personal physique, there are different manifestations such as cold, dampness, and heat. The main symptoms of the disease are fever, cough, and asthma, all of which are the main symptoms of breathing. The treatment should be treated by stages and syndrome differentiation.

Traditional Chinese Medicine observation: this patient left zygomatic bone looks redden, the eyebrow is too long, liver “Qi” is too prosperous, although liver function ALT and AST are critical, ALT/AST is 0.48, so there is inflammation, an observation also shows liver “yin” deficiency, liver, and kidney homologous, so kidney “water” shortage, consistent with the history of kidney stones, the patient’s tongue color is reddish, white and greasy coating, so phlegm is more, pulse smoothly. The plague theory stated, “when the wind and cold are on the surface, there is no coating in the tongue, that is, there is white coating, and it is also thin and smooth. When it is gradually introduced, it is from white to yellow, from yellow to dry, and from dryness to black.” As soon as the plague happens, headache and fever, white coating on the tongue is thick and not smooth; or yellow in color and yellowish; or as thick as powder. If the pathogenic factors enter the stomach, it will be two or three colors, and the

white coating will be dry or black and dry. Most of the epidemic evil into the stomach, tongue coating is quite like wind-cold, is both wet and therefore does not dry. However, the tongue coating is white and thick, different from typhoid fever. It can be distinguished in the eye, does not need pungent warming herbs to relieve exterior syndrome, into the inside, but with heat-clearing therapy can get it”^[4].

After early treatment with western medicine and proprietary Chinese medicine for antivirus, anti-infection, clearing away heat, detoxification, and phlegm treatment, mycoplasma pneumonia and influenza A turned negative. Although the symptoms were temporarily improved, the curative effect against the novel coronavirus was not ideal. The patients still had a recurrent fever, severe cough, a small amount of white mucus sputum, and no improvement in CRP. The chest CT showed that the focus of pulmonary infection was enlarged, and there were many new infectious lesions in both lungs and the struggle between good and evil was fierce. Syndrome belongs to cold and dampness attack lung hinders spleen, has the sign of clearing heat, has not yet injured “yin”, treatment should disperse wind, expel cold release lung “Qi” and stop cough, invigorate the spleen, dry dampness, Strengthening anti-pathogenic “Qi” and pathogenic factors, activate blood, remove stasis eliminate stagnation and dredge the collaterals, Cough is obvious at that time, therefore used experience prescription Qian Hu ZhiSou powder, prescription Qianhu (*Radix Peucedani*) stop cough and resolve phlegm, Jiegeng (*Radix Platycodi*) regulate lung “Qi”, dispelling phlegm and relieving cough, drawing medicine upward, one liter and one drop to restore lung “Qi” Xuanfa to exorcise evil function; Jingjie (*Herba Schizonepetae*) smell warm, its property is light and raises up, purges lung heat and reaches skin hair, relieves surface exorcism; Ziwan (*Radix Asteris*), Baibu (*Radix Stemonae*), Pipaye (*Folium Eriobotryae*, wrapped), Xingren (*Semen Armeniacae Amarum*) moisten lung to stop cough, at the same time Mahuang (*Herba Ephedrae*) with Xingren (*Semen Armeniacae Amarum*), Zhigancao (*Radix Glycyrrhizae*, roasted) to disperse wind and release lung “Qi”; Huangqin (*Radix Scutellariae*), Yuxingcao (*Herba Houttuyniae*), Guarou (*Fructus Trichosanthis*), Zhebeimu (*Bulbus Fritillariae Thunbergii*) clear away lung heat and resolve phlegm; Rugen (*Rhisoma*

Phragmites) clear lung heat, lung Qi, also for the introduction of meridians; Chen Pi (*Pericarpium Citri Reticulatae*), Cangzhu (*Rhisoma Atractylodis*), Caoguo (*Fructus Tsaoko*) dry dampness and invigorate the spleen, regulating Qi and dissipating phlegm; Taoren (*Semen Persicae*), Puhuang (pollen *Typhae*, wrapped), Shuizhi (*Hirudo*) activating blood circulation and removing blood stasis; Xianhecao (*Herba Agrimoniae*) strengthening anti-pathogenic Qi and eliminating pathogenic factors; Zhigancao (*Radix Glycyrrhizae*, roasted) regulate every herbs. So the effect of clearing the lung, relieving cough and removing phlegm, dispelling dampness, activating blood circulation, and removing blood stasis can be achieved by the combination of various drugs [5-6]. The prescription of dryness, dampness, and invigorating spleen is essential, and the scope of lung inflammation is expanded and has a tendency of fibrosis, so the products of clearing away heat and detoxifying, promoting blood circulation, and removing blood stasis are anti-inflammatory and anti-fibrosis. Puhuang (pollen *Typhae*, wrapped) and Cangzhu (*Rhisoma Atractylodis*) are the most important drugs for treating oral ulcers, which can relieve the heart fire and prevent the occurrence of a cytokine storm [7-8]. At the same time, Puhuang (pollen *Typhae*, wrapped), Rugen (*Rhisoma Phragmites*), and Xingren (*Semen Armeniacae Amarum*) all have the diuretic function, which can relieve the symptoms of left kidney stone. Taking three doses of medicine, combined with nutritional support and other symptomatic treatment, three days later, the cough of the patients was obviously improved, no fever, the ulcer surface of the upper jaw was reduced, and the cough symptoms of the patients were obviously improved compared with before, and the cough symptoms of the patients were obviously improved compared with before. On the basis of the original prescription, Rugen (*Rhisoma Phragmites*), Qianhu (*Radix Peucedani*), Daqingye (*Folium Isatidis*), and Jinyinhua

(*Flos Lonicerae*) were added 15 g each to enhance the effect of clearing away heat and detoxification and to enhance the antiviral and anti-inflammatory effects. Continue to clear the lung, dissipate phlegm and stop cough, dry dampness, promote blood circulation, and remove blood stasis. Results in the second party, NCP turned negative, but in the lung and large intestine, NCP positive in stool belonged to detoxification, evil had gone, can be understood, So people need not worry, western medicine understood as fecal mouth transmission and worry, it is unnecessary, tongue coating shows wet evil was away, The doctors thinks that NCP will lose the living environment, so pharynx swabs turn negative that was according to the national standard three times. This study also shows that the patient has an influenza and NCP mixed infection. According to the theory of traditional Chinese medicine, the patient's liver function is too strong; therefore, the spleen function has deficiency, which results in lung deficiency, that is, susceptible to COVID-19. According to the law of five elements, lung deficiency will not produce "water", coupled with a deficiency of liver "yin", liver and kidney homologous, so kidney "water" shortage. Hence, patients are prone to getting kidney stones. The pathogenesis of a stone lymphoid disease is caused by dampness and heat for a long time, causing the urine to form stones. The patient is a mixed infection of COVID-19, influenza A, and Mycoplasma pneumonia. In the past, there was a basic history of kidney stones, maternal diseases, and children. This treatment plan also treated Shi Lin (Kidney stone), reflecting the treatment concept of "disease prevention" in traditional Chinese medicine. A follow-up chest CT showed that the absorption of pulmonary lesions disappeared, and the symptoms completely disappeared, indicating that the great force of the combination of Chinese and Western medicine will certainly play a great role in the national fight against the epidemic situation.

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Disclosure statement

The authors declare no conflict of interest.

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