

Research Article

Open Access

Clinical Characteristics Analysis of 9 Cases COVID-19 Patients Receiving Integrated Traditional Chinese and Western Medicine: A Retrospective Study

Chengjian Cao^{1,2*}, Fang Zhang², Liuying Li³, Maoli Guo³, Minggang Yin^{1,2}, Huixiu Zhong³, Weiping Liu¹, Fuqiang Shao² and Deya Che^{3*}

¹Clinical Research Laboratory, Department of Clinical Examination, Zigong First People's Hospital, Zigong, PR China

²Zigong Academy of Medical Sciences, Zigong First People's Hospital; Zigong, PR China

³Department of Traditional Chinese Medicine, Zigong First People's Hospital, Zigong, PR China

ABSTRACT

Recently 2019-nCoV is still spreading around the world, vaccines have been developed but still no specific medicine so far, so here we want to provide a potential and complementary plan to COVID-19 or even other epidemic diseases. So, we hypothesized Traditional Chinese Medicine (TCM) may have positive effect on cure of COVID-19. Here we report 9 COVID-19 patients hospitalized in our hospital, including 8 mild-type and 1 severe-type. Besides antiviral and other supportive treatment (Western Medicine, WM), all of them received Traditional Chinese Medicine (TCM) at the same time, and we collected the epidemiological, demographic, clinical and laboratory data of the patients and analyzed the outcome. After treatment by integration of WM and TCM, the pulmonary inflammations are gradually absorbed and finally disappeared, and other laboratory tests turned to normal (hs-CRP, T lymphocytes, CD4+ T cells and CD8+ T, etc.). All patients (including the severe type) have been discharged from the hospital, and the shortest course of treatment is only 12 days. Together with the fact that other parts of China using TCM, we speculate TCM might play an encouraging role in this process and may be an adjuvant and complementary therapy of COVID-19, combined with the application of defeating SARS, which may bring a meaningful reference to COVID-19 or even other epidemic diseases' treatment worldwide, in spite of the efficacy and definite conclusions still need further study.

*Corresponding author's

Chengjian Cao, Clinical Research Laboratory, Department of Clinical Examination, Zigong First People's Hospital, Zigong, 643000, PR China.

Deya Che, Department of Traditional Chinese Medicine, Zigong First People's Hospital, Zigong, PR China

Received: March 21, 2024; **Accepted:** March 25, 2024; **Published:** March 30, 2024

Keywords: 2019-nCoV, COVID-19, Chinese Medicine, Western Medicine, Complementary Therapy

List of Abbreviations

TCM: Traditional Chinese Medicine

COVID-19: 2019 Novel Coronavirus Disease

2019-nCoV: 2019 Novel Coronavirus

Introduction

A new pneumonia called 2019 novel coronavirus disease (COVID-19) caused by the 2019 novel coronavirus (2019-nCoV) is a highly pathogenic and high-risk disease [1-2]. Recently, the COVID-19 has been effectively controlled in China, but the epidemic has been spreading rapidly around the world, especially in Italy, Iran, South Korea and Japan. Up to March 16, there are 167,511 confirmed (13,903 new) 6,606 deaths (862 new) globally; 86,434 confirmed (13,874 new) 3,388 deaths (848 new) 151 countries/territories/areas (4 new) [3]. On 11 March 2020, WHO has characterized COVID-19 as a pandemic disease [4].

Vaccines for 2019-nCoV have been developed in different countries, however, there still is no specific medicine so far. Although it has been reported that Remdesivir and Chloroquine can inhibit the 2019-nCoV in vitro It has also been reported that Remdesivir may have a promising clinical therapeutic effect and a Phase III clinical trial of the drug is also under going in China and the United States further Case-Controlled clinical studies of Remdesivir therapy are warranted to verify its therapeutic efficacy [5-8].

Hypothesis: Integration of Traditional Chinese and Western Medicine may accelerates COVID-19 Patients' Cure

To meet the challenges of controlling the epidemic situation of COVID-19, and with the successful experiences of cure SARS, we hypothesized Traditional Chinese Medicine (TCM) may have positive effect on cure of COVID-19. So, we treated the patients with TCM and Western Medicine (WM) at the same time, which obtained significant improvement. Here, we aim to provide a possible reference for the treatment of COVID-19 worldwide or even other epidemic diseases.

Evaluation of the Hypothesis: Data Collection and Analysis Patients

We collected the clinical data of 9 patients admitted to our hospital (the First People's Hospital of Zigong City, Zigong, China) from January 23, 2020 to February 27, 2020. And all patients were diagnosed with COVID-19 according to the "Diagnosis and treatment of pneumonia caused by 2019-nCoV (trial fourth edition)" issued by National Health Commission of China [9]. This study was approved by the Ethics Committee of First People's Hospital of Zigong City, and written informed consent was obtained from all patients.

Data Collection and Analysis

All patients underwent routine blood tests, liver biochemical indicators tests (ALT, AST, ALP, GGT, TP, TBIL, GLU, HDL-C, et al.), renal biochemical indicators tests (BUN, CREA, UA, et al.), hypersensitive C-Reactive Protein (hs-CRP) tests, 2019-nCoV nucleic acid test utilizing nasopharyngeal swabs (Novel Coronavirus PCR Fluorescence Diagnostic Kit, Bio Germ Medical Biotechnology, Shanghai) and tests of antibodies against pathogens associated with respiratory tract infection (including respiratory syncytial virus, adenovirus, Influenza A virus, Influenza B virus, parainfluenza virus, chlamydia pneumoniae, legionella pneumophila, mycoplasma pneumoniae, Cocksackie A virus, coxsackie B virus, ECHO virus), and in addition to Chest Computed Tomography (CT) imaging, and T-lymphocyte subsets analysis (performed by flow cytometry, Beckman Coulter, Navios, USA) [2].

We collected and analyzed their epidemiological, demographic, clinical manifestations and diagnosis, laboratory, treatment and outcome data by a retrospective study of the medical records. It should be pointed out that our Department of Clinical Laboratory had been approved by ISO15189 by China National Accreditation Service for Conformity Assessment (CNAS), and our hospital is a designated unit of 2019-nCoV detection. Besides, if the patient has other underlying diseases, there will be appropriate screening and monitoring and treatment.

Consequences of the Hypothesis and Discussion: LAMP-Based assays for Rapid Detection of COVID-19 Patients' Baseline Characteristics

As shown in Table 1, the COVID-19 patients were all middle-aged and elderly people, with the youngest age of 20 years old (Case 3) and the oldest age of 67 years old (Case 7), with an average age of 43.3; 7 females and 2 males (Case 1, Case 4), with a ratio of 3.5:1. All the patients had a history of sojourn in Wuhan or Hubei Province. 7 patients were diagnosed with COVID-19 on the same day, and two were diagnosed within 2 days when they admitted into hospital. 4 of the 9 patients had underlying diseases (Case 2: Syringomyelia, Case 4: Type 2 Diabetes Mellitus, Case 7: Hypertension/fatty liver, Case 8: Hypertension/Gallstone). The patient's condition improved in the shortest 2 days after treatment (Case 3, Case 4, Case 6) without recurrence, and improved in the longest 8 days without recurrence (Case 9). 1 of them had recurrent episodes (Case 1), and this one had the longest course, 32 days. The shortest course is only 12 days (Case 4).

Table 1: Basic Information of Patients

Items	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
Age(Year)	34	52	20	40	48	39	67	48	42
Average of Age	43.3								
Gender	M	F	F	M	F	F	F	F	F
F/M	3.5:1								
Whether has Hubei or Wuhan contact history	Y	Y	Y	Y	Y	Y	Y	Y	Y
Date of Admission	26,Jan.	27,Jan.	23,Jan.	25,Jan.	25,Jan.	30,Jan.	25,Jan.	26,Jan.	30,Jan.
Date of Discharge	27,Feb.	25,Feb.	7,Feb.	7,Feb.	20,Feb.	20,Feb.	18,Feb.	20,Feb.	18,Feb.
Disease courses(Days)	32	27	14	12	25	21	24	21	24
Average of Disease courses(Days)	22.2								
Time from Admission to Diagnosis	the day	the day	the day	the day	the day	the day	2 Days	the day	2 Days
Time from treatment to first improvement(Days)	5 days, but has relapse	7	2	2	3	2	6	3	8
Other diseases	None	Syringomyelia	None	Type 2 Diabetes Mellitus	None	None	Gastritis/ Hypertension (II Level, Moderate Group)/Gallstone	Hypertension (II Level, Moderate Group)/Fatty Liver	None

Note: M: Male; F: Female; Y: yes.

The above data indicate that if people who are from the epidemic area have the relevant symptoms still need to take relevant measures. And although Case 4 has Type 2 Diabetes Mellitus, but instead he has shortest duration, and the other patients who have underlying diseases were also cured without recurrence, suggest these underlying diseases did not affect the cure of COVID-19. It should also be noted that, except for the relapse in Cases 1, the symptoms of other patients had disappeared one week before discharge. And the virus nucleic acid was tested daily in the hospital to prevent recurrence, and the patients were not discharged until all nucleic acid was negative for 5 consecutive days. Of course, the same measures were taken for Cases 1 before his discharge.

Characteristics of Clinical Symptoms

As shown in Table 2, except for 2 patients with tachycardia, most of the patients had normal heart rates during the onset Case 8, Case 9). There was no increase in blood pressure except in two patients with chronic hypertension Case7, Case 8). All Respiratory Rates and Oxygen Saturation were normal. All the 9 patients had fever, but most of them had low fever, with the highest body temperature reaching 39.3°C. All the patients had no symptoms such as dizziness rhinobyon, rhinorrhea and headache. 8 out of 9 developed cough symptoms (except Case 1), 3 of them had no phlegm (Case 1, Case 2, Case 4) and the remaining 6 had phlegm. Only 1 out of 9 patients presented with systemic fatigue symptoms (Case 6), and 2 patients presented with systemic muscle stiffness & myalgia (Case 4, Case 6). In addition, there are 3 patients with Poor Appetite, Nausea, Acid Regurgitation and other gastrointestinal symptoms (Case 6, Case 7, Case 8), 2 patients appeared Chest Stuffiness (Case 5, Case 8), and 1 patient appeared nausea and vomiting after taking antiviral drugs. It can be seen the patients included in this study had fever and cough as the main symptoms, while the symptoms of fatigue and myodynia were less, which was consistent with previous reports by other study [2]. It is worth mentioning that Case 1 has neither cough nor phlegm nor muscle soreness and other symptoms, and has only fever and diarrhea with a maximum temperature of 38.6°C. However, it has also been diagnosed as COVID-19. Besides, he also had relapse.

Table 2: Clinical Characteristics of Patients

Items	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
Pulse Rate	86	78	86	86	90	80	85	104	110
Respiratory Rate	20	21	20	20	20	20	20	21	19
Blood Pressure	138/89	118/75	135/85	125/76	127/84	96/62	160/93	154/90	124/88
Blood Oxygen Saturation	96%	97%	99%	97%	98%	98%	96%	99%	97%
Fever(°C)	The highest is 38.6, last 3 days to normal	The highest is 38.0, last 4 days to normal	has fever on 29,Jan.last 3 days to normal, The highest is 37.9	The highest is 38.5, last 11 days and become normal on the second day of Admission	0	The highest is 38.0, last 7 days and become normal on the second day of Admission	The highest is 38.0,last 5 days and become normal on the second day of Admission	The highest is 39.3,last 5 days to normal	The highest is 38.4,last 3 days to normal
Dizziness	0	0	0	0	0	0	0	0	0
Rhinobyon	0	0	0	0	0	0	0	0	0
Rhinorrhoea	0	0	0	0	0	0	0	0	0
Headache	0	0	0	0	0	0	0	0	0
Cough	0	1	1	1	1	1	1	1	1
Phlegm	0	0	1	0	1	1	1	1	1
Dyspnoea	0	0	0	0	0	0	0	0	0
Fatigue	0	0	0	0	0	1	0	0	0
Constipation	0	0	0	0	0	0	0	0	0
Diarrhea	1	1	0	0	1	0	0	1	1
Muscular Stiffness&Myalgia	0	0	0	1	0	1	0	0	0
Other Symptoms	0	0	Nausea And Vomiting after Taking Antiviral Drugs	0	Chest Stuffiness; Palpitation	Poor Appetite; A Catsayer and Discomfort In The Abdomen On 2,Feb.	Ventosity; Poor Appetite; Nausea;Acid Regurgitation On 10, Feb.	Chest Stuffiness; Pharyngalgia;A Catsayer And Discomfort In The Abdomen; Acid Regurgitation	0

Note: 1 means Yes; 0 means No;

Examination, Treatment and Outcomes

As mentioned in the Methods part, all patients were undergoing routine blood tests, liver biochemical indicators tests, renal biochemical indicators tests, hypersensitive C-Reactive Protein(hs-CRP) tests and T-lymphocyte subsets analysis et al., also in addition to 2019-nCov nucleic acid test and chest CT imaging. In terms of treatment, as shown in Table 3, we applied the antiviral drugs Lopinavir/ Oseltamivir/Ritonavir, also used the Recombinant Human Interferon A2b and Chloroquine Phosphate Tablets, and also used specific antibiotics for therapy; Drugs such as Tetralogy of viable bifidobacterium tablet and Montmorillonite Powder were also used to improve the gastrointestinal reactions of patients such as diarrhea and diarrhea. Of course, different from some hospitals, we applied Traditional Chinese Medicine (TCM) treatment at the same time of antiviral and supportive treatment. According to the theory of traditional Chinese medicine, according to the different condition of each patient’s characteristics, our TCM doctors prescribed formulae that are the most consistent with the symptoms of the patients, thus ensure the curative effect and reduced the incidence of side effects.

Table 3: Clinical Treatment of Patients

Items	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
lopinavir/Oseltamivir/ Ritonavir	1	1	1	1	1	1	1	1	1
TCM (decoction) *	1	1	1	1	1	1	1	1	1
Chloroquine Phosphate Tablets	1	0	0	1	1	0	0	0	0
Recombinant Human Interferon A 2b	1	1	1	1	1	1	1	1	1
Antibiotic treatment**	1	1	1	1	1	0	1	1	1
Intestinal function improvement***	1	1	1	1	1	1	1	1	1

Note: 1 means Yes; 0 means No

* Because each patient’s symptoms are different, so according to the symptoms of each patient professional Traditional Chinese Medicine (TCM) doctors will appropriately prescribe a formulation to the patient, so here each TCM formulation is different from each other. Each patient’s formulation was shown in the Supplementary Materials 3.

**These drugs mainly are Moxifloxacin Hydrochloride, Piperacillin sodium tazobactam sodium et al.

*** These drugs mainly are Tetralogy of viable bifidobacterium tablets; Montmorillonite Powder et al.

According to the test results, in all patients, hs-CRP increased and T-lymphocytes decreased at onset, and the absolute values of CD4+ T cells and CD8+ T cells decreased in the T-cell subsets (as shown in Table 4). Chest CT shows all patients had presentation of the patchy scattered high-density shadows with the blurred boundary and ground-glass opacity or some consolidation in their bilateral or unilateral lung lobes, the upper lobe or the medial basal segment of the lower lobe, and ground glass opacities and patchy, and streaked shadows were the most common radiologic findings (as shown in Figure 1, 2, and Supplementary Materials 1), which is consistent with some results of other studies [10-11]. Other laboratory tests showed no specific changes (data are not listed here). And, after treatment, it can be seen that hs-CRP are reduced, the total number of T lymphocytes is increased, and the absolute values of CD4+ T cells and CD8+ T cells in the T cell subsets are also increased (as shown in Table 4, Figure 3, 4 and Supplementary Materials 2), meanwhile the chest CT examination shows that the inflammation is gradually absorbed and finally disappeared. As of Feb. 27, the last patient had been discharged (Case 1).

Table 4: Changes of Routine Blood Test and T Lymphocyte Subsets Analysis Before and After Treatment

Item	Case 1		Case 2		Case 3		Case 4		Case 5		Case 6		Case 7		Case 8		Case 9	
	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A
Routine Blood Test																		
Hypersensitive c-reactive protein (mg/L;normal range: 0-5)	12.10	0.6	26.7	0.8	1.11	3.6	25.4	1.4	3.94	0.4	0.67	0	94.4	4	14.68	9.2	4.1	0.3
White Blood Cells Count (10 ⁹ /L;normal range: 3.5-9.5)	2.9	4.74	2.16	3.38	6.04	5.42	4.84	4.84	4.4	5.79	2.67	4.74	5.38	5.72	5.17	7.7	4.71	4.19
Neutrophile Granulocyte Rate (%; normal range: 40-75)	65.50	51.30	51.3	60.6	46.8	48.5	64.4	44.5	57.3	63.8	43.4	60.2	76.5	63.9	68.4	62.3	59.3	53.6
Lymphocyte Rate (%; normal range: 20-50)	26.90	31.67	34.3	24.3	37.7	35.2	24	42.8	35.2	29.5	42.7	30.6	11.9	22	24.6	29.4	24.8	37.1
T Lymphocyte Subsets Analysis																		
CD3+CD4+ Rate (%; normal range:24.9-45.6)	46.11	44.19	49.87	31.59	45.65	39.96	37.79	59.44	42.81	48.53	34.76	37.03	48.53	50.14	56.28	55.19	50.28	49.83
CD3+CD8+ Rate (%; normal range: 16.4-33.8)	22.3	20.66	19.93	19.75	27.58	29.22	27.9	29.09	15.09	14.49	25.33	25.41	14.19	14.85	11.74	9.73	20.01	21.88
CD3+CD4+ Absolute Value (10 ⁶ /L;normal range: 200-1820)	448	481	211	229	870	977	539	1016	653	807	226	502	285	463	615	932	463	722

CD3+CD8+ Absolute Value (10 ⁶ /L;normal range:130-1350)	217	225	84	143	518	714	398	424	230	241	165	345	83	137	128	164	184	317
CD4/CD8 (normal range:0.89-2.01)	2.07	2.14	2.50	1.60	1.66	1.37	1.35	2.04	2.84	3.35	1.37	1.46	3.42	3.38	4.79	5.67	2.51	2.28
Lymphocyte Absolute Value (10 ⁶ /L;normal range:470-3260)	972	1,088	423	724	1851	2,445	1,427	1,716	1548	1,663	651	1,356	588	924	1,094	1,689	921	1,450

Note B: before treatment; A: after treatment.

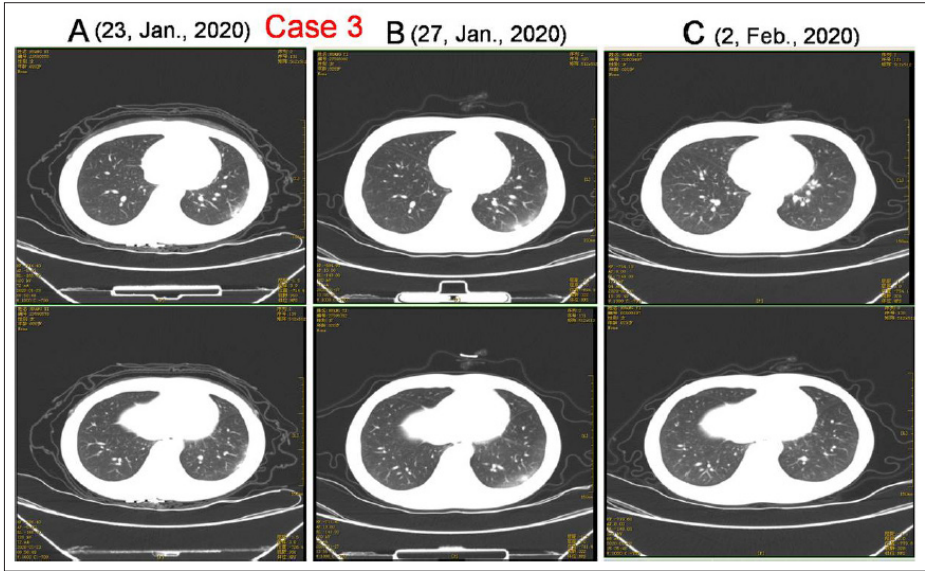


Figure 1: Chest CT Imaging of Patient 3

A: Below the Pleura Patchy Ground-Glass Opacity is seen in the Basement Segment of the Left Inferior Lobe.
B-C: Improvement is shown After Treatment with Integrated TCM and WM.

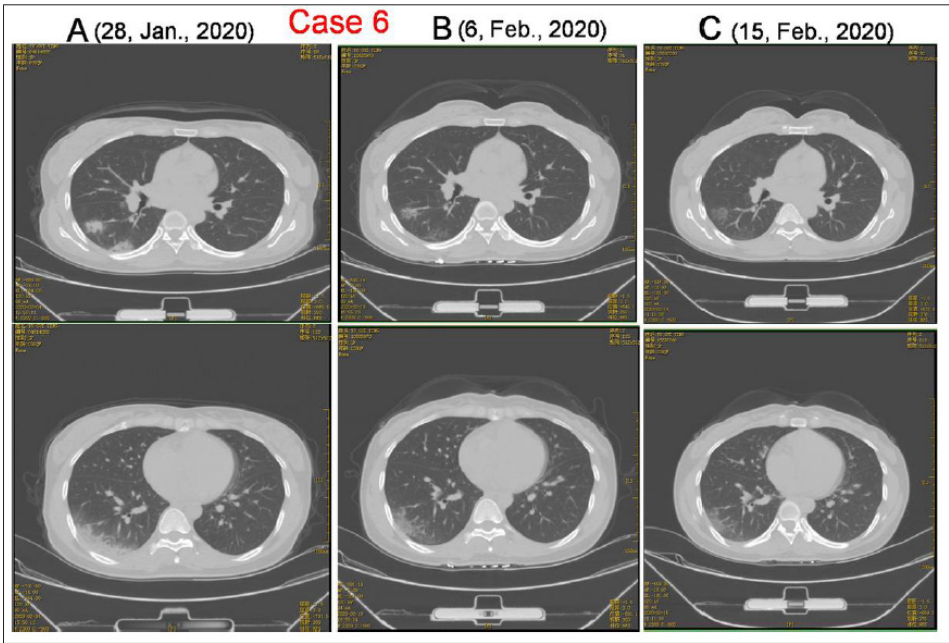


Figure 2: Chest CT Imaging of Patient 6

A: Patchy, Ground-Glass Opacity and Mesh Shadows were seen in the Lower Lobe of the Right Lung, with Blurred Edges. The Interlobular Septa were Thickened, changed significantly in the Peripheral Belt, and the Adjacent Pleura was Thickened and Adhered.
B-C: Improvement is shown after Treatment with Integrated TCM and WM.

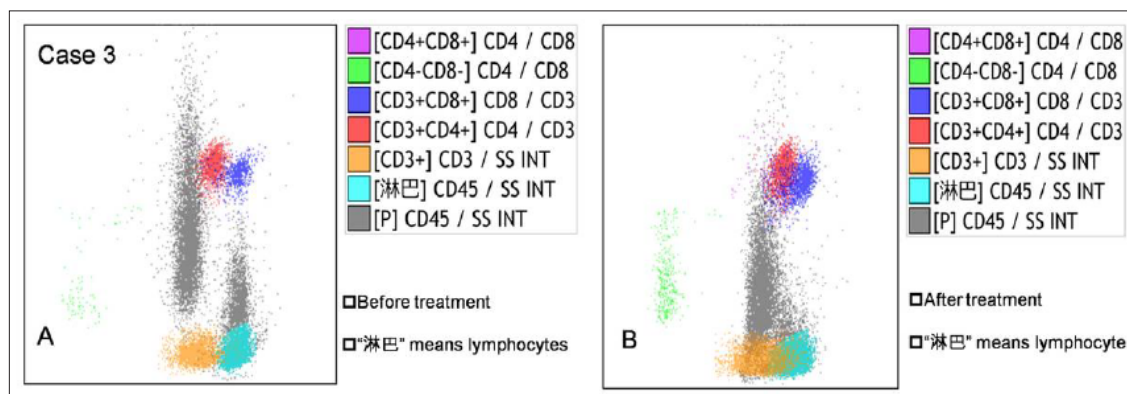


Figure 3: T Lymphocyte Subsets Analysis of Patient 3 Detected by FCM

A: Before Treatment. **B:** After Treatment. Gray: All white blood cells. Cyan: All lymphocytes We Analyzed, which are interacted with CD45 Antibody, named CD45+ T Lymphocytes. The Chinese Character “淋巴” means “Lymphocytes” in English. Saffron Yellow: All CD3+ T Lymphocytes. Red: CD3+ CD4+ T Lymphocytes. Blue: CD3+ CD8+ T Lymphocytes. Green: CD4- CD8- T Lymphocytes. Purple: CD4+ CD8+ T Lymphocytes.

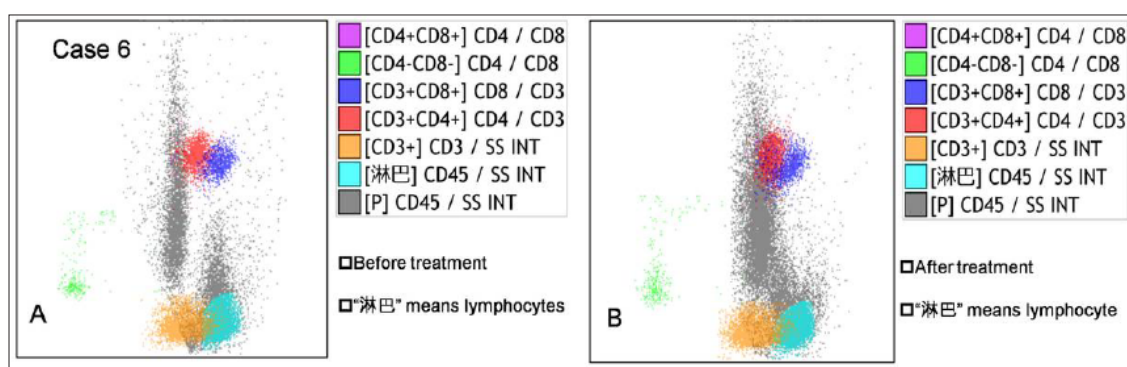


Figure 4: T Lymphocyte Subsets Analysis of Patient 6 Detected by FCM

A: Before Treatment. **B:** After Treatment. Gray: All White Blood Cells. Cyan: All Lymphocytes We Analyzed, which are interacted with CD45 Antibody, named CD45+ T Lymphocytes. The Chinese character “淋巴” means “Lymphocytes” in English. Saffron Yellow: All CD3+ T Lymphocytes. Red: CD3+ CD4+ T Lymphocytes. Blue: CD3+ CD8+ T Lymphocytes. Green: CD4- CD8- T Lymphocytes. Purple: CD4+ CD8+ T Lymphocytes.

Discussion

For now, total 9 patients have been recovered. Here it is worth mentioning 1 patient (Case 1) showed relapse. The relapse here means the chest CT examination of the two patients showed that the inflammation had been absorbed, but the viral nucleic acid test was sometimes negative and sometimes positive. Although it is impossible to completely rule out the errors caused by sample collection, transportation, detection reagent and operation, each inspection process is carried out in strict accordance with standard operating procedures. So Here we speculate 2 probable reasons: 1) We speculated there is a association between gut microbiota and 2019-nCov, because the related connections between the gut and lung, known as the “enter-lung axis”, has been cleared which means 2019-nCov may “hide” in the intestinal tract through “gut-lung axis” when treated with drugs, and may replace when efficacy of drugs disappearing via affecting the gut microbiota [12]. 2) We speculated the virus may have a variation to reduce virulence, but unfortunately due to our limited conditions, we were unable to conduct further in-depth studies on the specimens of the two patients (For example, gain the specimens for RNA-sequencing and perform RNA alignment with the existed sequences of 2019-nCov).

For now, there is no approved specific medicine or vaccine for 2019-nCov. Although it has been reported that Remdesivir may have a promising clinical therapeutic effect further Case-Controlled clinical studies are needed to verify its therapeutic

efficacy [6,8]. on the other hand, we can say that the control of the epidemic of COVID-19 in China nationwide is not due to the use of Remdesivir, but due to the widespread use of TCM combined with other western medicine. For example, TCM had appeared in the Trial Fourth Edition of the Clinical Guideline Diagnosis and Treatment Protocol for COVID-19 released by National Health Commission of China and National Administration of Traditional Chinese Medicine issued in January 28, 2020 and updated in the subsequent Editions (the newest is Trial Seventh Edition so far) and National Administration of Traditional Chinese Medicine also issued a specific TCM formulation Qing Fei Pai Du Tang (Lung cleansing & detoxifying decoction) to treat COVID-19 Furthermore, out of the 31 provinces in Chinese mainland, health authorities in 23 provinces had officially issued programs recommending TCM to preventing COVID-19 [9, 13-15]. And some studies reported that TCM could alleviate symptoms, shorten fever duration, recover radiological changes, and shorten hospital courses and Qing Fei Pai Du Tang has been used in 4 provincial hospitals in China to treat 214 COVID-19 patients, and the total effective rate was up to more than 90%; and 60% of them improved significantly in the symptoms and imaging performance, 30% of them have smooth symptoms without exacerbation [16, 17].

Besides, recently a cohort observational clinical trial on regularity of TCM syndrome and differentiation treatment of COVID-19 has been submitted to the National Library of Medicine (NLM)

belonging to National Institutes of Health (NIH), including two groups: Cohort of western medicine and Cohort of integrated TCM and western medicine, and possibly complete on May 2020 [18]. which may provide more conclusive proofs for utilizing TCM to COVID-19.

From our experience and results, TCM treatment of COVID-19 does not directly kill the virus, but promote the elimination of the virus by improving the patient's immunity. Our results showed that after treatment, the number of T lymphocytes increased significantly, especially CD4+ T cells and CD8+ T cells (FIG. 1). As we all know that CD4+ T cells are helper T cells that secrete interleukin and interferon, and CD8+ T cells are cytotoxic T cells that play an important role in killing infected cells. Besides, CD4+/CD8+ ratio also increased in 7 out of 9 patients, which indicated that TCM could improve the patients' immunity, which are also found in SARS treatment [19]. So, the application of TCM is like to equip with more powerful weapons and provide more soldiers for the human body to fight the virus, and the mechanism of TCM is different from that of antibiotics and also other antiviral drugs such as Remdesivir. Furthermore, TCM could play roles in every part of COVID-19, including prevention, Health care and treatment, and also including adult, elderly and children [20-22].

However, our retrospective study also had major drawbacks, such as the failure to establish a control group due to respect for life. Even so, we believe that from the situation of hospitals in other parts of the country that do not use TCM, as well as the curative effect of China using TCM to control COVID-19, there is also the application of TCM in the treatment of SARS in 2003 and in the treatment of H1N1 in 2009 TCM could play a significant role in the cure of COVID-19 [23-27].

On the other aspect, because TCM has the characteristics of symptom-based diagnosis, individual treatment and no need for large detection equipment, so we believe in this severe situation of the outbreak and spread of a new type of pathogen, and can't find or develop specific targeted drugs for a while, and even the clinical effect of TCM on COVID-19 is far from conclusive, TCM combined with WM treatment may be a good additional candidate

for the cure of COVID-19 [28, 29].

Conclusions

In conclusion, via our practical experiences and cases analysis, we consider the application of western medicine is indispensable in the process of COVID-19 treatment, however, if TCM also be applied at the same time, it can quickly alleviate the symptoms, accelerate the cure. So, together with the fact that other parts of China using TCM, we speculate TCM might play an encouraging role in this process and may be an adjuvant and complementary therapy of COVID-19, combined with the application of defeating SARS, which may bring a meaningful reference to COVID-19 or even other epidemic diseases' treatment worldwide, in spite of the efficacy and definite conclusions still need further study.

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of First People's Hospital of Zigong City, and written informed consent was obtained from all patients.

Consent for Publication: All authors have been consent for publication of this paper.

Availability of Data and Materials: All data and materials are available from the corresponding author anytime.

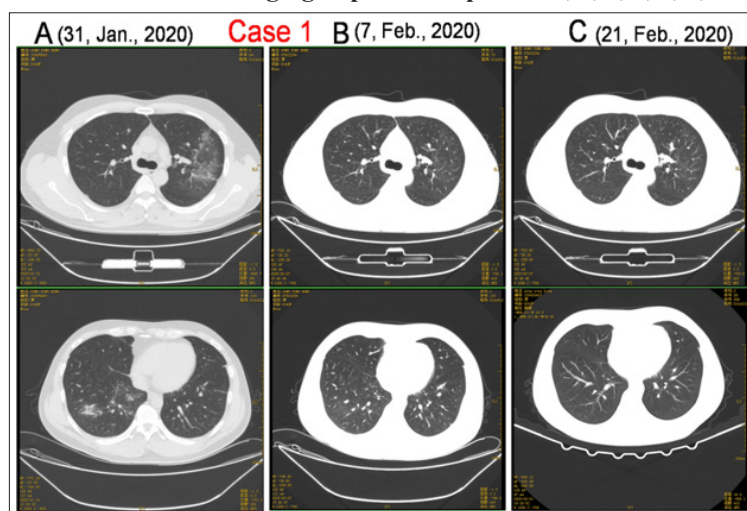
Acknowledgements: Many thanks for Daniel Sapozhnikov who helped to revise the manuscript.

Conflict of Interests: There is no conflict of interest to disclose

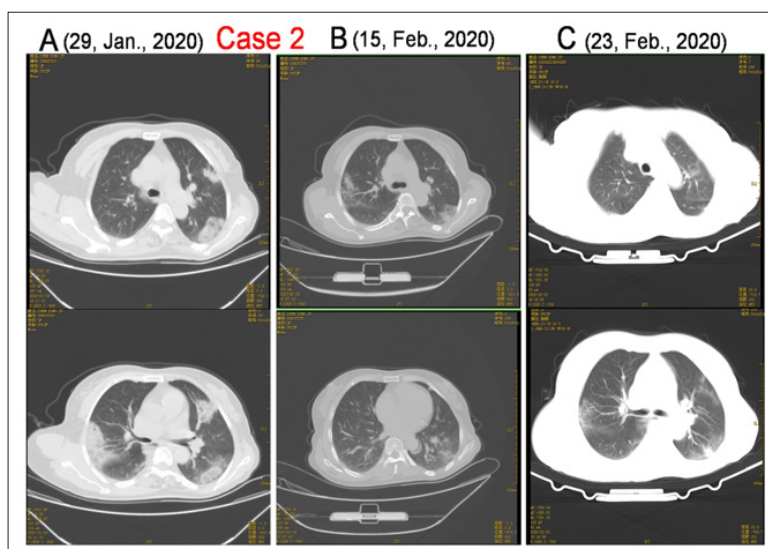
Funding: This work was supported by Key Science and Technology Projects of Science and Technology Bureau of Zigong (2019YLSF01).

Authors' Contributions: Conceived and designed the study: Chengjian Cao, Deya Che; Data collection: Liuying Li, Maoli Guo, Fuqiang Shao; Data analysis Chengjian Cao, Fang Zhang, Huixiu Zhong, Weiping Liu; Contributed to the writing of the manuscript: Chengjian Cao, Deya Che.

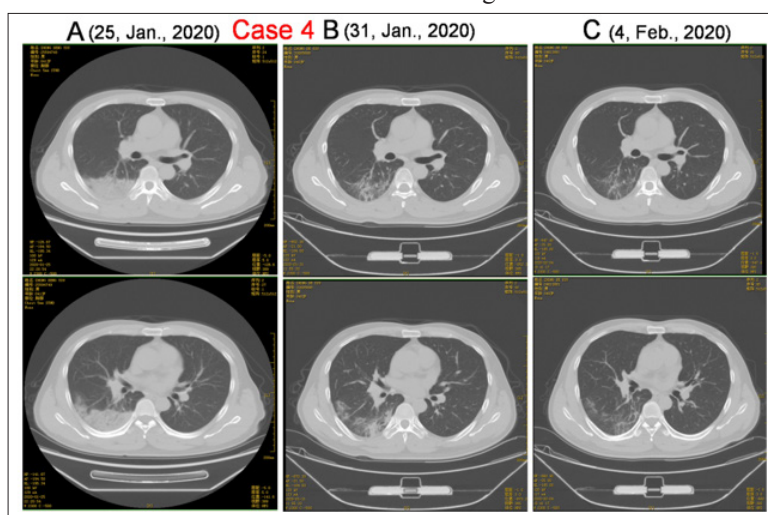
Supplementary materials 1 Chest CT imaging of patient of patient 1, 2, 4, 5, 7, 8, 9



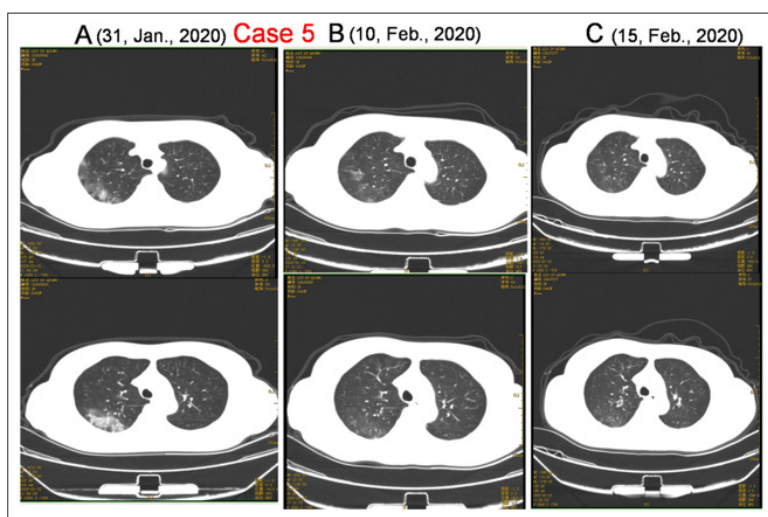
Sup-CT-Figure 1: Chest CT imaging of patient 1. A: In the lower lobes of the left and right lung, there are patchy streaked shadows and high density shadows with uneven density, some parts are thin. B-C: improvement are shown after treatment with integrated traditional Chinese and Western medicine



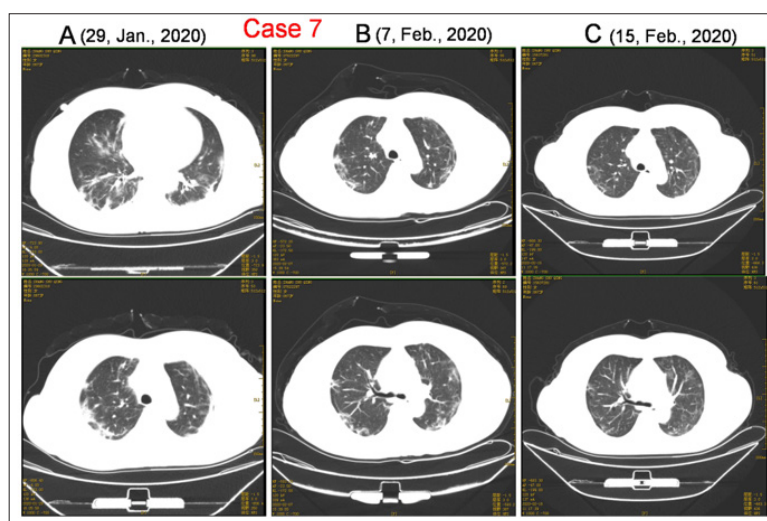
Sup-CT-Figure 2: Chest CT imaging of patient 2. A: The multilobular segments of the double lungs were speckled shadows with increased density, some of which showed ground-glass opacity, with slightly blurred edges, and the density was uneven, mainly in subpleural section. B-C: improvement are shown after treatment with integrated traditional Chinese and Western medicine



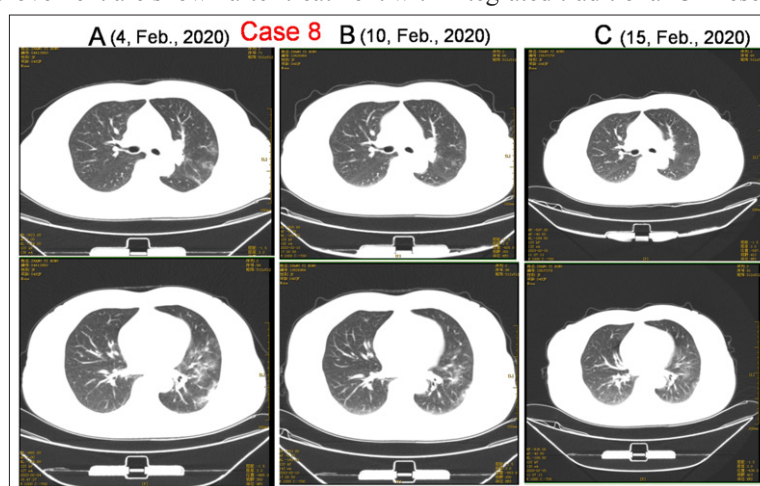
Sup-CT-Figure 3: Chest CT imaging of patient 4. A: Multiple patches of flocculation were found in the left and right lung, some of the boundary was unclear, the lower lobe of the right lung was involved, and some of the lung tissue consolidation was found. B-C: improvement are shown after treatment with integrated traditional Chinese and Western medicine



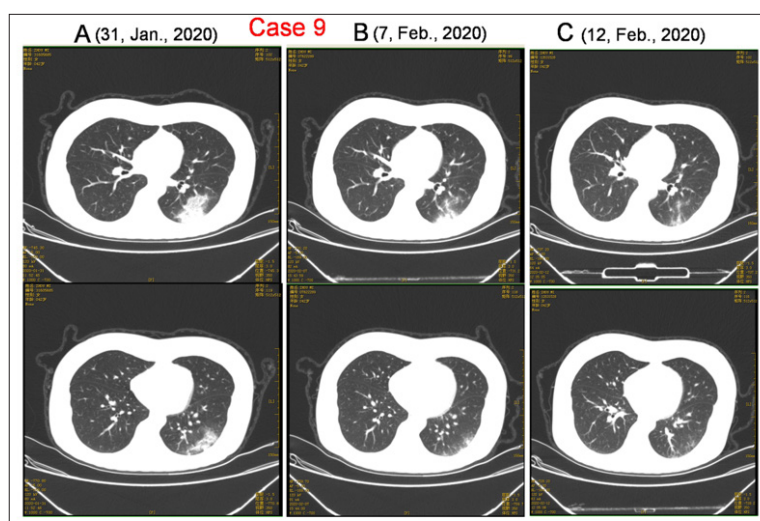
Sup-CT-Figure 4: Chest CT imaging of patient 5. A: Larger ground glass density shadows and partial consolidation shadows were seen in the tip of the upper lobe of the right lung. Others have small blotches on the left and right lung. B-C: improvement are shown after treatment with integrated traditional Chinese and Western medicine



Sup-CT-Figure 5: Chest CT imaging of patient 7. A: There were speckled, patchy, and streaked shadows in the left and right lungs. The density was not uniform, and part of the boundary was not clear, especially in the upper lobe of the left lung and the lower lobe of the right lung. B-C: improvement are shown after treatment with integrated traditional Chinese and Western medicine



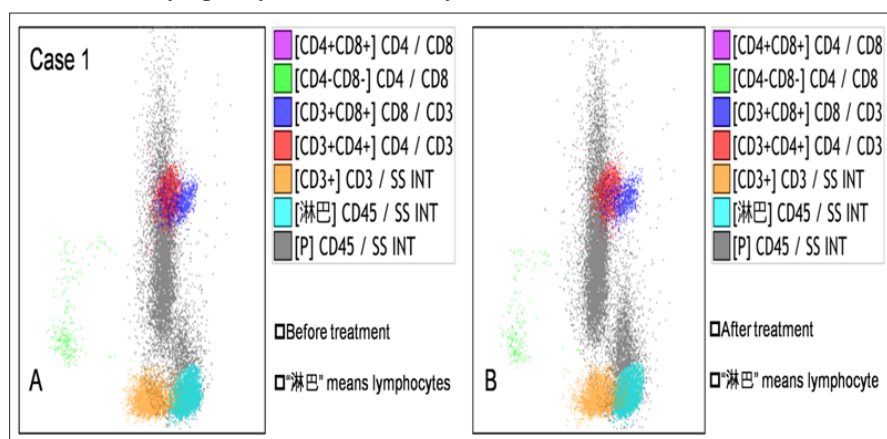
Sup-CT-Figure 6: Chest CT imaging of patient 8. A: In the left lung, there were patches, increased mesh density shadows, blurred edges, thickened interlobular septa, and obvious changes in the subpleural peripheral belt. There are few streaks in the lower lobe of the right lung. B-C: improvement are shown after treatment with integrated traditional Chinese and Western medicine



Sup-CT-Figure 7: Chest CT imaging of patient 9. A: In the lower lobe of the left lung, there was a mottled shadow with increased mesh density, some of which showed ground-glass opacity, mainly with the outer belt, and no exudation or space-occupying lesions were observed in the rest of the lung. B-C: improvement are shown after treatment with integrated traditional Chinese and Western medicine

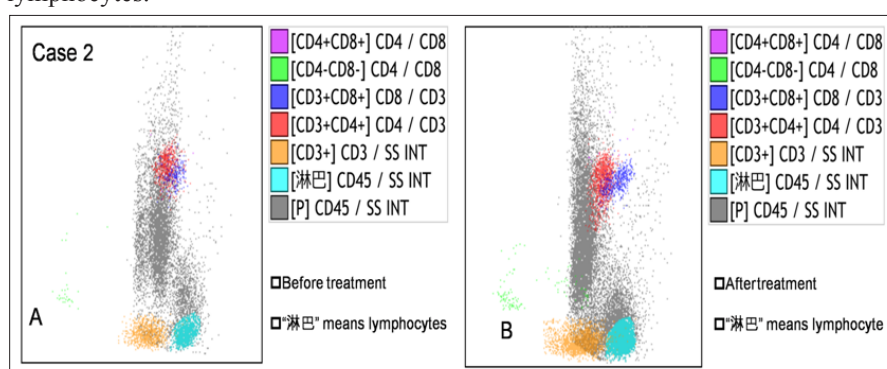
Supplementary Materials 2

T Lymphocyte Subsets Analysis of Patient 1, 2, 4, 5, 7, 8, 9



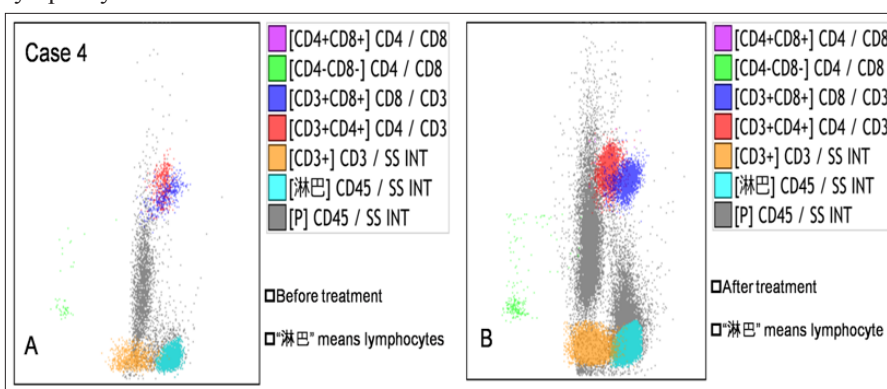
Sup-FCM-Figure 1: T lymphocyte Subsets Analysis of Patient 1 Detected by Flow Cytometry(FCM)

A: before treatment. **B:** after treatment. Gray: All white blood cells. Cyan: All lymphocytes we analyzed, which are interacted with CD45 antibodies, named CD45+ T lymphocytes. The Chinese character“淋巴” means “lymphocytes” in English. Saffron Yellow: All CD3+ T lymphocytes. Red: CD3+ CD4+ T lymphocytes. Blue: CD3+ CD8+ T lymphocytes. Green: CD4- CD8- T lymphocytes. Purple: CD4+ CD8+ T lymphocytes.



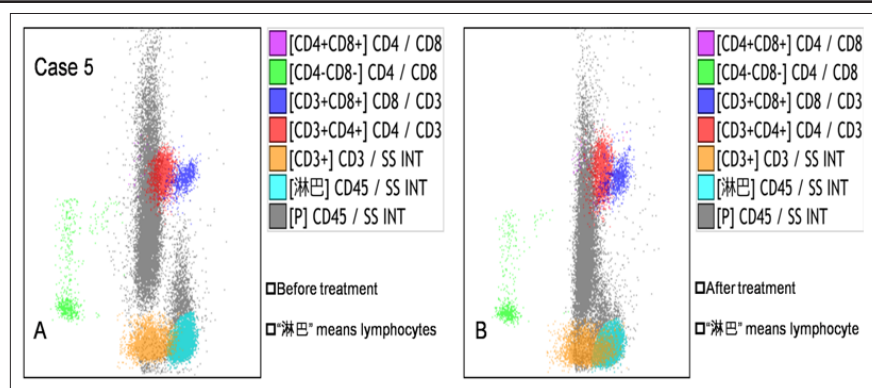
Sup-FCM-Figure 2: T lymphocyte Subsets Analysis of Patient 2 Detected by FCM

A: before treatment. **B:** after treatment. Gray: All white blood cells. Cyan: All lymphocytes we analyzed, which are interacted with CD45 antibodies, named CD45+ T lymphocytes. The Chinese character“淋巴” means “lymphocytes” in English. Saffron Yellow: All CD3+ T lymphocytes. Red: CD3+ CD4+ T lymphocytes. Blue: CD3+ CD8+ T lymphocytes. Green: CD4- CD8- T lymphocytes. Purple: CD4+ CD8+ T lymphocytes.



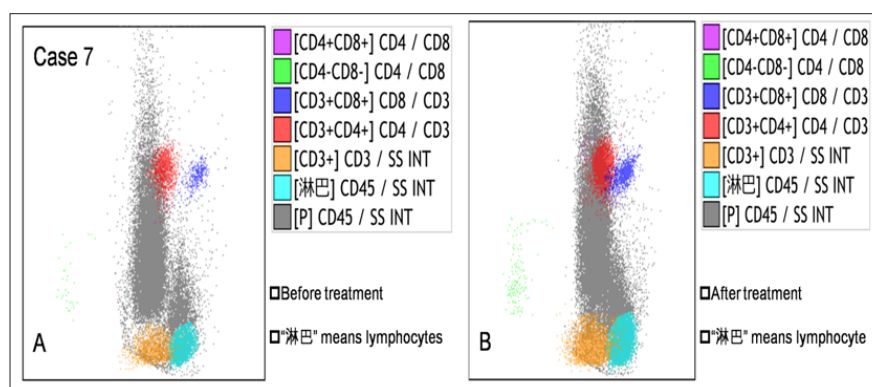
Sup-FCM-Figure 3: T lymphocyte Subsets Analysis of Patient 4 Detected by FCM

A: before treatment. **B:** after treatment. Gray: All white blood cells. Cyan: All lymphocytes we analyzed, which are interacted with CD45 antibodies, named CD45+ T lymphocytes. The Chinese character“淋巴” means “lymphocytes” in English. Saffron Yellow: All CD3+ T lymphocytes. Red: CD3+ CD4+ T lymphocytes. Blue: CD3+ CD8+ T lymphocytes. Green: CD4- CD8- T lymphocytes. Purple: CD4+ CD8+ T lymphocytes.



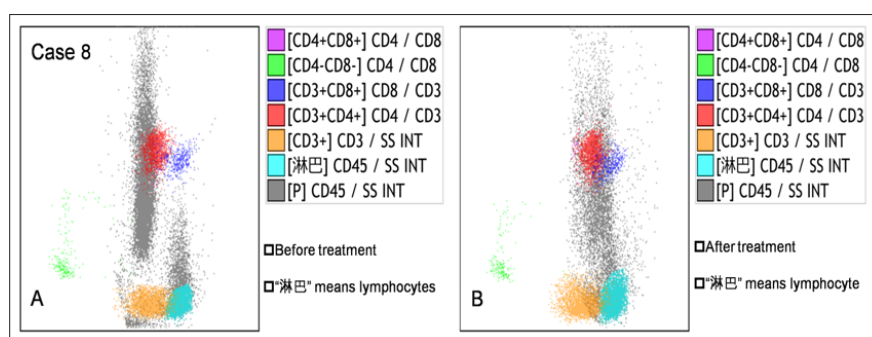
Sup-FCM-Figure 4: T lymphocyte subsets analysis of patient 5 detected by FCM

A: before treatment. **B:** after treatment. Gray: All white blood cells. Cyan: All lymphocytes we analyzed, which are interacted with CD45 antibodies, named CD45+ T lymphocytes. The Chinese character“淋巴” means “lymphocytes” in English. Saffron Yellow: All CD3+ T lymphocytes. Red: CD3+ CD4+ T lymphocytes. Blue: CD3+ CD8+ T lymphocytes. Green: CD4- CD8- T lymphocytes. Purple: CD4+ CD8+ T lymphocytes.



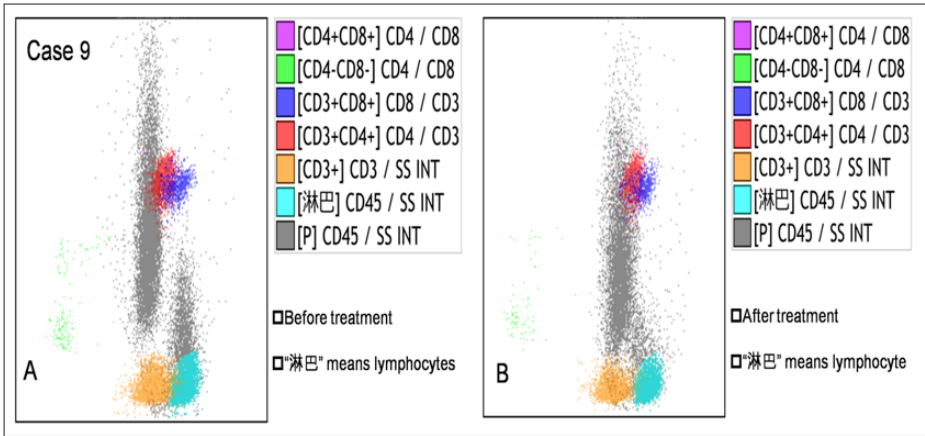
Sup-FCM-Figure 5: T Lymphocyte Subsets Analysis of Patient 7 Detected by FCM

A: before treatment. **B:** after treatment. Gray: All white blood cells. Cyan: All lymphocytes we analyzed, which are interacted with CD45 antibodies, named CD45+ T lymphocytes. The Chinese character“淋巴” means “lymphocytes” in English. Saffron Yellow: All CD3+ T lymphocytes. Red: CD3+ CD4+ T lymphocytes. Blue: CD3+ CD8+ T lymphocytes. Green: CD4- CD8- T lymphocytes. Purple: CD4+ CD8+ T lymphocytes.



Sup-FCM-Figure 6: T Lymphocyte Subsets Analysis of Patient 8 Detected by FCM

A: before treatment. **B:** after treatment. Gray: All white blood cells. Cyan: All lymphocytes we analyzed, which are interacted with CD45 antibodies, named CD45+ T lymphocytes. The Chinese character“淋巴” means “lymphocytes” in English. Saffron Yellow: All CD3+ T lymphocytes. Red: CD3+ CD4+ T lymphocytes. Blue: CD3+ CD8+ T lymphocytes. Green: CD4- CD8- T lymphocytes. Purple: CD4+ CD8+ T lymphocytes.



Sup-FCM-Figure 7: T Lymphocyte Subsets Analysis of Patient 9 Detected by FCM

A: before treatment. **B:** after treatment. Gray: All white blood cells. Cyan: All lymphocytes we analyzed, which are interacted with CD45 antibodies, named CD45+ T lymphocytes. The Chinese character“淋巴” means “lymphocytes” in English. Saffron Yellow: All CD3+ T lymphocytes. Red: CD3+ CD4+ T lymphocytes. Blue: CD3+ CD8+ T lymphocytes. Green: CD4- CD8- T lymphocytes. Purple: CD4+ CD8+ T lymphocytes.

Formula of the 9 patients and the QingFeiPaiDuTang(Lung cleansing & detoxifying decoction)

Case 1			
Latin name	Chinese pinyin name	Chinese name	Dose
Lonicerae Japonicae Flos	Jinyinhua	金银花	30 g
Taraxaciherba	Pugongying	蒲公英	30 g
Forsythiae Fructus	Lianqiao	连翘	15 g
Pogostemon Cablin (Blanco) Benth.	Guanghuoxiang	广藿香	15 g
Platycodon Grandiflorus	Jiegeng	桔梗	15 g
Polygoni Cuspidati Rhizoma Et Radix	Huzhang	虎杖	20 g
Sophorae Tonkinensis Radix Et Rhizome	Shandougen	山豆根	15 g
Gypsum Fibrosum	Shigao	石膏	30 g
Pheretima	Dilong	地龙	15 g
Cicadae Periostracum	Chantui	蝉蜕	15 g
Stemonae Radix	Baibu	百部	15 g
Poria Cocos (Schw.) Wolf.	Fuling	茯苓	15 g
Arctii Fructus	Niubangzi	牛蒡子	15 g
Cynanchistauntonii Rhizoma Et Radix	Baiqian	白前	15 g
Artemisia Annua L.	Qinghao	青蒿	20 g
Menthae Herba	Bohe	薄荷	15 g
Licorice	Gancao	甘草	10 g

Case 2			
Latin name	Chinese pinyin name	Chinese name	Dose
Pogostemon Cablin (Blanco) Benth	Guanghuoxiang	广藿香	15 g
Platycodon Grandiforus	Jiegeng	桔梗	15 g
Sophorae Tonkinensis Radix Et Rhizome	Shandougen	山豆根	10 g
Atractylodes Lancea (Thunb.)Dc.	Cangzhu	苍术	15 g
Atractylodes Macrocephala Koidz.	Baizhu	白术	15 g
Amomum Tsao-Ko Crevostet	Caoguo	草果	10 g
Isatidis Folium	Daqingye	大青叶	15 g
Oryzaefructusgerminatus	Daoya	稻芽	15 g
Hordei Fructus Germinatus	Maiya	麦芽	15 g
Coicis Semen	Yiyiren	薏苡仁	30 g
Magnolia Officinalis Rehd Et Wils.	Houpu	厚朴	10 g
Ephedra Herba	Mahuang	麻黄	15 g
Rhizoma Dioscoreae	Shanyao	山药	15 g
licorice	Gancao	甘草	10 g
Taraxacihherba	pugongying	蒲公英	30 g

Case 3			
Latin name	Chinese pinyin name	Chinese name	Dose
Ephedra Herba	Mahuang	麻黄	15 g
Amygdalus Communis Vas	Kuxingren	苦杏仁	15 g
Platycodon Grandiforus	Jiegeng	桔梗	15 g
Scutellariae Radix	Huangqin	黄芩	20 g
TARAXACIHERBA	pugongying	蒲公英	30 g
Isatidis Folium	Daqingye	大青叶	15 g
Cynanchistauntonii Rhizoma Et Radix	Baiqian	白前	15 g
Stemonae Radix	Baibu	百部	15 g
Forsythiae Fructus	Lianqiao	连翘	15 g
Dictamni Cortex	Baixianpi	白鲜皮	15 g
Mori Cortex	Sangbaipi	桑白皮	15 g
Pheretima	dilong	地龙	15 g
GYP SUM FIBROSUM	shigao	石膏	20 g
Radix Rhei Et Rhizome	Dahuang	大黄	6 g
Lepidii Semen Descurainiae Semen	Tinglizi	葶苈子	15 g
Perillae Fructus	Zisuzi	紫苏子	15 g
Licorice	Gancao	甘草	10 g

Case 4			
Latin name	Chinese pinyin name	Chinese name	Dose
Ephedra Herba	Mahuang	麻黄	15 g
Amygdalus Communis Vas	Kuxingren	苦杏仁	20 g
Platycodon Grandiforus	Jiegeng	桔梗	15 g
GYPSUM FIBROSUM	shigao	生石膏	30 g
Scutellariae Radix	Huangqin	黄芩	20 g
Isatidis Folium	Daqingye	大青叶	15 g
TARAXACIHERBA	pugongying	蒲公英	30 g
Cynanchistauntonii Rhizoma Et Radix	Baiqian	白前	15 g
Stemonae Radix	Baibu	百部	15 g
Cicadae Periostracum	Chantui	蝉蜕	15 g
Polygoni Cuspidati Rhizoma Et Radix	Huzhang	虎杖	20 g
Sophorae Tonkinensis Radix Et Rhizome	Shandougen	山豆根	10 g
Mori Cortex	Sangbaipi	桑白皮	15 g
Pheretima	dilong	地龙	15 g
Forsythiae Fructus	Lianqiao	连翘	15 g
Dictamni Cortex	Baixianpi	白鲜皮	15 g
Eriobotryae Folium	Pipaye	枇杷叶	15 g
Perillae Fructus	Zisuzi	紫苏子	15 g
Raphani Semen	Laifuzi	莱菔子	15 g
Licorice	Gancao	甘草	10 g
Lepidii Semen Descurainiae Semen	Tinglizi	葶苈子	15 g

Case 5			
Latin name	Chinese pinyin name	Chinese name	Dose
Ephedra Herba	Mahuang	麻黄	15 g
Amygdalus Communis Vas	Kuxingren	苦杏仁	20 g
GYPSUM FIBROSUM	shigao	生石膏	30 g
Platycodon Grandiforus	Jiegeng	桔梗	15 g
Scutellariae Radix	Huangqin	黄芩	20 g
Forsythiae Fructus	Lianqiao	连翘	15 g
Allium Azureum Ledeb.	Xiebai	薤白	20 g
Cynanchistauntonii Rhizoma Et Radix	Baiqian	白前	15 g
Stemonae Radix	Baibu	百部	15 g
Fritillariae Thunbergii Bulbus	Zhebeimu	浙贝母	10 g
Mori Cortex	Sangbaipi	桑白皮	15 g
Pheretima	dilong	地龙	15 g
Polygoni Cuspidati Rhizoma Et Radix	Huzhang	虎杖	15 g
Sophorae Tonkinensis Radix Et Rhizome	Shandougen	山豆根	10 g
Radix Rhei Et Rhizome	Dahuang	大黄	6 g
Dictamni Cortex	Baixianpi	白鲜皮	15 g
Perillae Fructus	Zisuzi	紫苏子	15 g
Eriobotryae Folium	Pipaye	枇杷叶	15 g

Licorice	Gancao	甘草	10 g
Crataegi Folium	Shanzhay	山楂	15 g

Case 6			
Latin name	Chinese pinyin name	Chinese name	Dose
Ephedra Herba	Mahuang	麻黄	15 g
Amygdalus Communis Vas	Kuxingren	苦杏仁	15 g
GYPsum FIBROsum	shigao	石膏	30 g
Atractylodes Lancea (Thunb.)Dc.	Cangzhu	苍术	15 g
Imperatae Rhizoma	Baimaogen	白茅根	30 g
Scutellariae Radix	Huangqin	黄芩	20 g
Cynanchistauntonii Rhizoma Et Radix	Baiqian	白前	15 g
Stemonae Radix	Baibu	百部	15 g
Fritillariae Thunbergii Bulbus	Zhebeimu	浙贝母	10 g
Mori Cortex	Sangbaipi	桑白皮	15 g
Pheretima	dilong	地龙	15 g
Amomum Tsao-Ko Crevostet	Caoguo	草果	10 g
Polygoni Cuspidati Rhizoma Et Radix	Huzhang	虎杖	15 g
TARAXACIHERBA	pugongying	蒲公英	30 g
Pogostemon Cablin (Blanco) Benth.	Guanghuoxiang	广藿香	15 g
Platycodon Grandiforus	Jiegeng	桔梗	15 g
Licorice	Gancao	甘草	10 g
Crataegi Folium	Shanzhay	山楂	15 g

Case 7			
Latin name	Chinese pinyin name	Chinese name	Dose
Ephedra Herba	Mahuang	麻黄	15 g
Lepidii Semen Descurainiae Semen	Tinglizi	葶苈子	15 g
Allium Azureum Ledeb.	Xiebai	薤白	30 g
Scutellariae Radix	Huangqin	黄芩	20 g
Platycodon Grandiforus	Jiegeng	桔梗	15 g
GYPsum FIBROsum	shigao	石膏	20 g
Cynanchistauntonii Rhizoma Et Radix	Baiqian	白前	15 g
Stemonae Radix	Baibu	百部	15 g
Dictamni Cortex	Baixianpi	白鲜皮	15 g
Mori Cortex	Sangbaipi	桑白皮	15 g
Pheretima	dilong	地龙	15 g
Isatidis Folium	Daqingye	大青叶	15 g
Forsythiae Fructus	Lianqiao	连翘	15 g
TARAXACIHERBA	pugongying	蒲公英	30 g
Polygoni Cuspidati Rhizoma Et Radix	Huzhang	虎杖	15 g
Pseudostellariae Radix	Taizishen	太子参	30 g
Radix Rhei Et Rhizome	Dahuang	大黄	6 g
Crataegi Folium	Shanzhay	山楂	15 g

Allium Azureum Ledeb.	Xiebai	薤白	30 g
Licorice	Gancao	甘草	10 g
Amygdalus Communis Vas	Kuxingren	苦杏仁	20 g

Case 8			
Latin name	Chinese pinyin name	Chinese name	Dose
Ephedra Herba	Mahuang	麻黄	15 g
Amygdalus Communis Vas	Kuxingren	苦杏仁	20 g
Platycodon Grandiforus	Jiegeng	桔梗	15 g
Scutellariae Radix	Huangqin	黄芩	20 g
Isatidis Folium	Daqingye	大青叶	15 g
TARAXACIHERBA	pugongying	蒲公英	30 g
GYP SUM FIBROSUM	shigao	石膏	30 g
Cynanchistauntonii Rhizoma Et Radix	Baiqian	白前	15 g
Stemonae Radix	Baibu	百部	15 g
Cicadae Periostracum	Chantui	蝉蜕	15 g
Polygoni Cuspidati Rhizoma Et Radix	Huzhang	虎杖	15 g
Sophorae Tonkinensis Radix Et Rhizome	Shandougen	山豆根	10 g
Mori Cortex	Sangbaipi	桑白皮	15 g
Radix Rhei Et Rhizome	Dahuang	大黄	6 g
Licorice	Gancao	甘草	10 g
Crataegi Folium	Shanzhay	山楂	15 g

Case 9			
Latin name	Chinese pinyin name	Chinese name	Dose
Lonicerae Japonicae Flos	Jinyinhua	金银花	30 g
Artemisia Annua L.	Qinghao	青蒿	20 g
Menthae Herba	Bohe	薄荷	15 g
Forsythiae Fructus	Lianqiao	连翘	15 g
Isatidis Folium	Daqingye	大青叶	15 g
TARAXACIHERBA	pugongying	蒲公英	30 g
Platycodon Grandiforus	Jiegeng	桔梗	15 g
Polygoni Cuspidati Rhizoma Et Radix	Huzhang	虎杖	15 g
Sophorae Tonkinensis Radix Et Rhizome	Shandougen	山豆根	10 g
Stemonae Radix	Baibu	百部	20 g
Cicadae Periostracum	Chantui	蝉蜕	15 g
Perillae Fructus	Zisuzi	紫苏子	15 g
Arctii Fructus	Niubangzi	牛蒡子	15 g
Scutellariae Radix	Huangqin	黄芩	20 g
Radix Rhei Et Rhizome	Dahuang	大黄	6 g
Ophiopogonis Radix	Maidong	麦冬	15 g
Licorice	Gancao	甘草	10 g

QingFeiPaiDuTang(Lung cleansing & detoxifying decoction)			
Latin name	Chinese pinyin name	Chinese name	Dose
Ephedra Herba	Ma Huang	麻黄	9 g
licorice	Gan Cao	炙甘草	6 g
Amygdalus Communis Vas	Xing Ren	杏仁	9 g
Gypsum Fibrosum	Shi Gao	石膏	20 g
Cinnamomi Ramulus	Gui Zhi	桂枝	9 g
Alisma Orientale (Sam.) Juz.	Ze Xie	泽泻	9 g
Polyporus Umbellatus(Pers)Fr.	Zhu Ling	猪苓	9 g
Atractylodes Macrocephala Koidz.	Bai Zhi	白术	9 g
Poria Cocos(Schw.) Wolf.	Fu Ling	茯苓	15 g
Radix Bupleuri	Chai Hu	柴胡	16 g
Scutellariae Radix	Huangqin	黄芩	6 g
Arum Ternatum Thunb.	Ban Xia	半夏	9 g
Zingiber Officinale Roscoe	Gan Jiang	生姜	9 g
Asteris Radix Et Rhizoma	Zi Wan	紫菀	9 g
Farfarae Flos	Kuan Dong Hua	款冬花	9 g
Belamcandae Rhizome	She Gan	射干	9 g
Asari Radix Et Rhizoma	Xi Xin	细辛	6 g
Rhizoma Dioscoreae	Shan Yao	山药	12 g
Aurantii Fructus Immaturus	Zhi Shi	枳实	6 g
Citrus Reticulata	Chen Pi	陈皮	6 g
Pogostemon Cablin (Blanco) Benth.	Huo Xiang	藿香	9 g

References

- Zhu N, Zhang D, Wang W (2020) A novel coronavirus from patients with pneumonia in China, 2019. *N Engl J Med* 382: 727-733.
- Huang C, Wang Y, Li X (2020) Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* 395: 497-506.
- World Health Organization (2020) World Health Organization Corona virus Disease 2019 (COVID-19) Situation Report-56. Geneva. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200316-sitrep-56-covid-19.pdf?sfvrsn=9fda7db2_2.
- World Health Organization (2020) WHO Director-General's opening remarks at the media briefing on COVID-19-11. <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>.
- Wang M, Cao R, Zhang L (2020) Remdesivir and chloroquine effectively inhibit the recently emerged novel coronavirus (2019-nCoV) in vitro. *Cell Res* 30: 269-271.
- Holshue ML, DeBolt C, Lindquist S, Lofy KH, Wiesman J, et al. (2020) First case of 2019 novel coronavirus in the United States. *N Engl J Med* 382: 929-936.
- Ministry of Science and Technology, PRC. A clinical trial of the antiviral drug Remdesivir was launched in Wuhan. http://www.most.gov.cn/kjbgz/202002/t20200206_151440.htm.
- Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh PR (2020) severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. *Int J Antimicrob Agents* 55: 105924.
- National Health Commission of China, National Administration of Traditional Chinese Medicine (2020) Diagnosis and treatment of pneumonia caused by 2019-nCoV (Trial Fourth Edition) [EB]. <http://bgs.satcm.gov.cn/zhengcewenjian/2020-01-28/12576.html>.
- Chen N, Zhou M, Dong X (2020) Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet* 395: 507-513.
- Wu JT, Leung K, Leung G M (2020) Now casting and forecasting the potential domestic and international spread of the 2019-nCoV outbreak originating in Wuhan, China: a modelling study. *Lancet* 395: 689-697.
- National Health Commission of China, National Administration of Traditional Chinese Medicine (2020) Diagnosis and treatment of pneumonia caused by 2019-nCoV (Trial Seventh Edition) [EB] <http://bgs.satcm.gov.cn/zhengcewenjian/2020-03-04/13594.html>.
- Enaud R, Prevel R, Ciarlo E (2020) The Gut-Lung Axis in Health and Respiratory Diseases: A Place for Inter-Organ and Inter-Kingdom Crosstalks. *Front Cell Infect Microbiol* 10: 9.
- National Administration of Traditional Chinese Medicine (2020) Notice on the recommendation of the use of "lung clearing and detoxification soup" in the treatment of COVID-19 in combination of traditional Chinese and western medicine. <http://yzs.satcm.gov.cn/zhengcewenjian/2020-02-07/12876.html>.
- Luo H, Tang QL, Shang YX (2020) Can Chinese Medicine Be Used for Prevention of Corona Virus Disease 2019 (COVID-19)? A Review of Historical Classics, Research Evidence and Current Prevention Programs. *Chin J Integr Med* 26: 243-250.
- Yao Kailao, Liu Ming Yu, Li Xin, Huang Ji Han, Cai Hong-Bin (2020) Retrospective clinical analysis of treating

- pneumonia with new coronavirus infection with Chinese traditional medicine lianhua qingwen. *Chinese journal of experimental formulae* pp: 1-7.
17. Progress in screening of effective prescriptions of traditional Chinese medicine. <http://bgs.satcm.gov.cn/gongzuodongtai/2020-02-06/12866.html>.
 18. Clinicaltrials.gov. (2020) Clinical Trial on Regularity of TCM Syndrome and Differentiation Treatment of COVID-19 in Jiangsu Province. <https://clinicaltrials.gov/ct2/show/NCT04306497?cond=covid-19&draw=2&rank=3>.
 19. Lau TF, Leung PC, Wong EL (2005) Using herbal medicine as a means of prevention experience during the SARS crisis. *Am J Chin Med* 33: 345-356.
 20. Joseph N, Lu G (1962) Hygiene and preventive medicine in ancient China. *J History Med All Sci*.17: 429-478.
 21. Chan KW, Wong VT, Tang SCW (2020) COVID-19: An Update on the Epidemiological, Clinical, Preventive and Therapeutic Evidence and Guidelines of Integrative Chinese-Western Medicine for the Management of 2019 Novel Coronavirus Disease. *Am J Chin Med* 48: 737-762.
 22. Zhu Yue Ling, Yang Bin Bin, Wu Fang (2020) Understanding of new coronavirus pneumonia (COVID-19) in children from different perspectives of Chinese and western medicine. *Journal of Chinese Traditional and Herbal Drugs* pp: 1-5.
 23. Leung PC (2007) The efficacy of Chinese medicine for SARS: a review of Chinese publications after the crisis. *Am J Chin Med* 35: 575-581.
 24. Lai ST (2005) Treatment of severe acute respiratory syndrome. *Eur J Clin Microbiol Infect Dis*. 24: 583-591.
 25. Liu J, Manheimer E, Shi Y, Gluud C (2004) Chinese herbal medicine for severe acute respiratory syndrome: a systematic review and meta-analysis. *J Altern Complement Med* 10: 1041-1051.
 26. World Health Organization (2004) SARS: clinical trials on treatment using a combination of traditional Chinese medicine and Western medicine. Geneva, Switzerland, Available at: <https://apps.who.int/medicinedocs/pdf/s6170e/s6170e.pdf>.
 27. Lau J, Leung P, Wong E, Fong C, Cheng K, et al. (2005) The use of an herbal formula by hospital care workers during the severe acute respiratory syndrome epidemic in Hong Kong to prevent severe acute respiratory. *J Alternat Complement Med* 11: 49-55.
 28. Wei Chen, Chi Eung Danforn Lim, Hong Jun Kang, Jianping Liu (2011) Chinese Herbal Medicines for the Treatment of Type H1N1 Influenza: A Systematic Review of Randomized Controlled Trials. *PLoS One* 6: e28093.
 29. Wang C, Wang H, Liu X, Xu D, Tang Y, et al. (2014) Traditional Chinese medicine for the treatment of influenza: a systematic review and meta-analysis of randomized controlled trials. *J Tradit Chin Med* 34: 527-531.