Traditional Chinese Medicine symptom characteristics and prescriptions in 196 patients with COVID-19 from Wanzhou, Chongqing

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Abstract

Objective: Clinical symptoms of COVID-19 patients differ in regions. Our objective is to explore the characteristics of TCM symptoms and prescriptions of COVID-19 patients in Wanzhou area of Chongqing. Methods: We investigated hospitalized cases of COVID-19 in Wanzhou, Chongqing. The primary outcomes of interest were TCM symptoms and prescriptions, while the secondary outcomes included chest computed tomography (CT), white blood cell counts, lymphocyte levels, and C-reactive protein (CRP) levels.Results: Among the 196 included patients with COVID-19, the top five TCM symptoms were: poor appetite (82.14%), cough (65.31%), fatigue (17.86%), aversion to cold (16.84%), and fever (17.35%). Their five most common TCM prescriptions were: Sashen Radix Ophipodonis Decoction (38.22%), Sijunzi Decoction (37.7%), Maxing Shigan Decoction (31.94%), Sanren Decoction (15.71%), and Xiaochaihu Decoction (12.04%). Participants' TCM symptom scores before hospital discharge were lower than on admission (P < 0.05). There were also statistically significant differences in white blood cell counts, lymphocyte levels, and CRP levels before or after discharge from hospital as compared with before admission (P < 0.05).Conclusion: The dominant clinical symptoms of patients with COVID-19 in Chongqing were poor appetite, cough, and fatigue, which may be related to the geography and climate of Wanzhou. The TCM prescriptions given to the patients were consistent with their most common symptoms and the fact that the lung and spleen are the main viscera invaded by COVID-19. Traditional Chinese Medicine had a positive effect on patients with COVID-19.

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ABSTRACT :*Objective* : Clinical symptoms of COVID-19 patients differ in regions. Our objective is to explore the characteristics of TCM symptoms and prescriptions of COVID-19 patients in Wanzhou area of Chongqing.*Methods* : We investigated hospitalized cases of COVID-19 in Wanzhou, Chongqing. The primary outcomes of interest were TCM symptoms and prescriptions, while the secondary outcomes included chest computed tomography (CT), white blood cell counts, lymphocyte levels, and C-reactive protein (CRP) levels.*Results* : Among the 196 included patients with COVID-19, the top five TCM symptoms were: poor appetite (82.14%), cough (65.31%), fatigue (17.86%), aversion to cold (16.84%), and fever (17.35%). Their five most common TCM prescriptions were: Sashen Radix Ophipodonis Decoction (38.22%), Sijunzi Decoction (37.7%), Maxing Shigan Decoction (31.94%), Sanren Decoction (15.71%), and Xiaochaihu Decoction (12.04%). Participants' TCM symptom scores before hospital discharge were lower than on admission (P < 0.05). There were also statistically significant differences in white blood cell counts, lymphocyte levels, and CRP levels before or after discharge from hospital as compared with before admission (P < 0.05).*Conclusion* : The dominant clinical symptoms of patients with COVID-19 in Chongqing were poor appetite, cough, and fatigue, which may be related to the geography and climate of Wanzhou. The TCM prescriptions given to

the patients were consistent with their most common symptoms and the fact that the lung and spleen are the main viscera invaded by COVID-19. Traditional Chinese Medicine may have a positive effect on patients with COVID-19.

Key words: COVID-19; Wanzhou district; Chongqing; TCM; TCM symptoms; TCM prescriptions

What's known

The main symptoms of COVID-19 were fever and cough.

What's new

The clinical manifestations of COVID-19 patients may be related to geography and climate.

1. Introduction

In traditional Chinese medicine (TCM) novel coronavirus disease 2019 (COVID-19) belongs to the category of "epidemic diseases". The cause of the disease is "plague rage" with characteristics that include rapid onset, mutual infection, similar symptoms, and serious illness. The COVID-19 medical scheme (trial edition 8) (National,et al.,2020)suggests that different considerations such as the state of the illness, underlying physical conditions, and local climate characteristics impact the clinical manifestations and potential treatment of COVID-19. Current TCM understanding of the disease suggests that it primarily affects the lung, and its etiology and disease onset and progression are mainly due to the cold-dampness epidemic pathogen. Traditional Chinese medicine symptoms and protocols vary for COVID-19, which is a reflection of the complexity of the disease. The main cluster of COVID-19 patients in Chongqing, China was located in Wanzhou. Thus, this study conducted a retrospective analysis of patients with COVID-19 from Wanzhou to summarize their TCM symptom characteristics and prescriptions. These findings will provide a reference for the regional pathogenic characteristics of COVID-19 and TCM treatment based on symptom differentiation.

2. Methods

2.1 Source population

Patients with COVID-19 diagnosed and hospitalized at the Chongqing Three Gorges Central Hospital (Wanzhou, Chongqing, China).

2.2 Diagnostic criteria

Diagnostic and discharge criteria were based on The Diagnosis and Treatment Protocol for COVID-19 (Trial Version 8) issued by the National Health Commission and the State Administration of TCM [1].

2.3 Inclusion Criteria

We included patients (1) that fulfilled diagnostic criteria for COVID-19, (2) were aged 18 years or older, and (3) had complete inpatient medical records at the Chongqing Three Gorges Central Hospital.

2.4 Exclusion criteria

Exclusion criteria were: (1) multiple organ failure; (2) severe liver or kidney function impairment (i.e., alanine aminotransferase/glutamic-oxalacetic transaminase > three-fold upper limit or serum creatinine > 265 umol/L); (3) serious cerebrovascular diseases, blood system diseases, nervous system diseases, and malignant tumors; (4) acute myocardial infarction or cardiogenic shock; (5) pregnancy or lactation; and (6) a mental disorder or unwillingness to cooperate with study protocols.

2.5 TCM symptoms and auxiliary examinations

We identified inpatient medical records for all patients hospitalized with COVID-19 patients in the study hospital. We extracted and summarized patients' TCM symptoms (at time of admission), including fever, aversion to cold, cough, shortness of breath, fatigue, nasal congestion, runny nose, sore throat, body ache, poor appetite, and diarrhea [1]. The recorded body temperature caused by fever (as measured by the nursing

staff) was categorized as normal (36–37), low (37°C–38°C), medium (38.1°C–39°C), high (39.1°C–41°C), or ultra-high (> 40°C). All of the other symptoms were scored as 0, 1, 2, or 3 (integers) according to their severity. For example, in the case of a cough, 0 points were assigned for no cough, 1 point was assigned for occasional cough, 2 points were assigned for occasional cough, and 3 points were assigned for frequent cough. We also extracted serological results (as recorded by the physician) for the following variables: white blood cell count, lymphocyte count, and C-reactive protein (CRP) level. Finally, chest computed tomography (CT) images taken at admission were compared to those taken before discharge. These imaging tests were evaluated by a professional radiologist. Improved chest CT scans met the following criteria: no new exudative lesions, the scope of the exudative lesions was narrowed, and the density of the lesions was reduced. No significant changes in exudative lesions were considered as no significant changes, and more exudative lesions were considered as aggravation.

2.6 Statistical analyses

IBM SPSS Statistics for Windows, version 22.0 (IBM Corp., Armonk, N.Y., USA) was used for data analysis. Continuous data were summarized as mean $\pm$ standard deviation ($\bar{x} \pm s$) and compared using t-tests (normally distributed data) or non-parametric tests (non-normally distributed data). Statistical significance was set as $P < 0.05$.

3. Results

3.1 General information

Inpatient medical records of 207 patients with COVID-19 patients were identified. After excluding 11 patients younger than 18 years of age, 196 patients with COVID-19 were included in the study. Participants' average age was 46.5 ± 13.5 years age (age range = 20–82 years). There were 110 males (average age = 46.2 ± 12.8 years old) and 86 females (average age = 46.9 ± 14.4 years old). As shown in Table 1, there were no gender differences in age ($P = 0.516$).

3.2 Admission temperature

The lowest record body temperature was 36.2, highest was 39.4, and average was 36.9 ± 0.55. There were 162 (82.7%), 22 (11.2%), 10 (5.1%), 2 (1.02%), and 0 patients with normal (36–37), low (37degC–38degC), medium (38.1degC–39degC), high (39.1degC–41degC), and ultra-high (>40degC) fevers, respectively.

3.3 Traditional Chinese medicine symptom characteristics and prescriptions at admission

The five symptoms that occurred most commonly among participants were poor appetite (82.1%), cough (65.3%), fatigue (17.9%), fever (17.4%), and aversion to cold (16.8%), as shown in Table 2.

Of the 196 patients with COVID-19, 191 received TCM prescriptions for COVID-19. Of these, the five most common were Shashen Maidong Decoction (38.2%), Sijunzi Decoction (37.7%), Maxing Shigan Decoction (31.9%), Sanren Decoction (15.7%), and Xiaochaihu Decoction (12.0%), as shown in Table 3.

3.4 Changes in traditional Chinese medicine symptoms

The intention of these analyses was to investigate the curative effects of TCM. Thus, TCM symptom scores were only calculated for the 191 patients that received a TCM prescription. All of the changes in TCM symptom scores ($x \pm s$) were statistically significant ($P < 0.05$), as shown in Table 4.

3.5 Changes in chest computed tomography images

Chest CTs improved in 142 cases (72.45%), showed no significant change in 50 cases (25.55%), and showed aggravation in four cases (2%).

3.6 White blood cells, lymphocyte, C-reactive protein change

Four patients had incomplete white blood cell, lymphocyte, and CRP data. Among the 192 patients with complete data, there were statistically significant ($P < 0.05$) changes in these variables between admission

3

and discharge (Table 5).

4. Discussion

Through a retrospective review of inpatient medical records, we found that the TCM symptoms of patients with COVID-19 in Wanzhou were mainly poor appetite, cough, fatigue, aversion to cold, and fever. The TCM prescriptions most commonly prescribed to these patients were Sashanopong Decoction, Sijunzi Decoction, Maxing Shigan Decoction, Sanren Decoction and Xiaochaihu Decoction. These prescriptions correspond to the TCM symptoms experienced by patients. After TCM treatment, chest inflammation decreased, leukocytes and lymphocytes increased, and CRP decreased.

Patients with COVID-19 have presented with different TCM symptoms in different regions of China. In Hubei province, fever and fatigue were dominant(J et

al.,2020), in Guangdong and Zhejiang province, fever and cough were dominant(X et al.,2020; S et al.,2020), in Gansu and Shaanxi province, cough and fever were dominant (Z et al.,2020; Y et al.,2020), and in Tianjin, poor appetite and diarrhea were dominant(H et al.,2020). The dominant clinical symptoms of patients with COVID-19 in Chongqing were poor appetite, cough and fatigue, which may be related to the geographical and climate of the region. Specifically, Chongqing has a subtropical monsoon humid climate. The spleen likes dryness and dislikes dampness. Humid climate often hinders the transport and transformation of the spleen, resulting in symptoms such as poor appetite, cough, fatigue and other symptoms.

Our finding of the five most common TCM prescriptions given to patients with COVID-19 makes sense when considering patients' predominant symptoms and the typical indications for the prescriptions. Dryness damages the lungs and dampness impedes the spleen. Thus, when COVID-19 invades the respiratory system, it mainly presents with symptoms such as fever, cold, cough, shortness of breath, fatigue, stuffy nose, runny nose, and sore throat. When it invades the spleen and digestive system, symptoms like poor appetite and diarrhea will occur. The two most common TCM prescriptions in this study (i.e., Sashen Maidong Decoction and Sijunzi Decoction) are consistent with the most common TCM symptoms experienced by patients (e.g., numbness and cough). These, in turn, are consistent with the fact that the lung and spleen are the main viscera invaded by COVID-19(W et al.,2020).

In the relationship between "dryness" and "dampness" in the etiology of COVID-19, the "dryness" pathogen occupies a dominant position (Y et al.,2020). In the early stage of external infection, the "pathogenic heat" obstructs the lungs and presents symptoms such as cough. Maxing Shigan Decoction clears the lungs of asthma. In the middle stage of the disease, the Xiaochaihu Decoction with reconciling Shaoyang combats the "evil qi in the Half exterior and half interior." In the late stage of the disease, there is a "Consumption of Qi and injury of Yin," and the lungs and spleen are mainly affected by COVID-19. Therefore, the Shashen Maidong decoction can nourish yin and moisten the lung and stomach. Finally, when COVID-19 invades the spleen and stomach, it causes poor appetite and weakness in the spleen due to dampness. Sanren Decoction clears away dampness and heat, while Sijunzi Decoction cultivates the spleen and lung.

5. Conclusion

The symptoms of patients with COVID-19 in Wanzhou are different from those in other regions of China. This may be related to Wanzhou's geographical environment and climate. Laboratory tests and chest CTs showed consistent characteristics of COVID-19. After TCM treatment, TCM symptoms of Covid-19 showed an improvement, including the reduction of chest inflammation, increased leukocytes and lymphocytes, and decreased CRP.

Data Availability

The data used to support the findings of this study are included within the article.

Declarations of interest

None

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Author contributions

Chen Yong: Data curation, Formal analysis, Writing - original draft. **Liu Huabao:** Investigation, Formal analysis.**Wang Yujin:** Data curation,Statistic analysis.**Mou Fangzheng:** Investigation, Data curation. **Tang Lilin:** Project administration,Resources.**He Deying:** Investigation,Formal analysis. **Ren Yi:**Supervision, Writing - review & editing.

Acknowledgements

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