Etiology and pathogenesis of corona virus disease 2019 on the view of Chinese medicine

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Abstract

Traditional Chinese Medicine has played an important role in the prevention and treatment of the Corona Virus Disease 2019 epidemic. But in views of different TCM scholars there are different opinions about disease name, characteristic of etiology, law of pathogenesis about this epidemic. Based on related literatures, this article overviews the characteristics of TCM etiology, law of pathogenesis and methods of syndrome differentiation, hoping to find research method that fit in with TCM clinical practice. Prerequisite of treatment is identifying the cause. The clinical manifestations of patients are important to TCM, and the etiological attributes can be inferred from the clinical manifestations. SARS-CoV-2 belongs to exogenous etiological factors, but there are different opinions about its characteristics of six pathogenic factors. Cold, Dampness, Warm, Dry, Toxin, Summer-heat, Wind, are all involved. Thus, different understanding of the pathogenesis and the law of transmission is caused. Such as cold and dampness hurt Yang, furthermore, consumed of Qi; dampness and toxin infected from external environment, turbid dampness produced inside the body; dryness affecting lungs and consume of Yin; warm-heat-turbid-toxin affected lungs, stomach and intestine; and then produced phlegm stagnation or blood stasis, furthermore consumed Qi and Yin. Based on those differences, methods of syndrome differentiation in treatment of COVID-19 are diverse, which contain pattern differentiation of zang-fu organs, pattern differentiation of Wei-defence, Qi, Ying nutrients and blood; pattern differentiation by the eight principles, and pattern differentiation of six meridians. Because of SARS-CoV-2 can spread to the whole country or even the whole world in a short period of time, its pathogenic nature should be roughly the same. So studying the treatment of COVID-19 based on clinical cases, refining the similarities and differences in the clinical presentation of patients with different subtypes during the epidemic, clarification of the etiologic attribution and evolutionary patterns of disease mechanisms, developing a comprehensive understanding of COVID-19 in Chinese medicine is needed. Furthermore, getting a full understanding of COVID-19, and providing reference for the prevention and treatment of unknown infectious diseases.

Keywords: COVID-19; traditional Chinese medicine; etiology; pathogenesis
Background

The corona virus disease 2019 (COVID-19) pandemic was caused by severe acute respiratory disease corona virus 2 (SARS-CoV-2), until now, the virus has been mutating [1]. As of February 2024, there are over 774 million confirmed cases and more than seven million deaths have been reported world wide [2]. The sudden onset of the epidemic has posed a huge challenge to healthcare systems worldwide. Before the successful development of effective drugs and vaccines, Chinese medicine has made great contributions to the prevention and control of epidemics [3]. Despite the fact that scholars are not unanimous in their understanding of the etiology and pathogenesis of COVID-19, they have all achieved good clinical outcomes. Summarizing the similarities and differences in the therapeutic formulas of scholars will help to understand the common features of the etiology and pathogenesis of the COVID-19 furthermore better promote the experience of Chinese medicine in combating epidemics.

The epidemic will surely be forgotten with the passage of time, but the important role of traditional Chinese medicine (TCM) in responding to sudden infectious diseases must not be forgotten. The timely collation of valuable information on etiological attributes, evolutionary pattern of the SARS-CoV-2 after its attack on the human body, and the prescription and medication experience in the diagnosis and treatment of this epidemic, will help to enrich the knowledge of Chinese medicine in the new era of epidemics, and lay the foundation for the construction of a system for the prevention and treatment of epidemics by Chinese medicine.

The TCM etiology of SARS-CoV-2 is not clarty

Defining the cause of disease is a prerequisite for studying the evolution of disease mechanisms, but scholars’ knowledge on the categorization of etiologic attributes of SARS-CoV-2 in TCM is not yet unified. There are five main views about which of the six pathogenic factors COVID-19 belongs to, that will be described as follows.

SARS-CoV-2 is pestilence Qi with cold and dampness, which tends to impair Yang

Wang Yongyan’s team believed that this new corona virus belongs to the category of “cold epidemic”, it was caused by the feeling of dryness, followed by coldness or dampness and coldness [4]. Combined the clinical manifestations of the initial patients and the climate characteristics of Wuhan at that time, Tong Xiaolin believed that this outbreak is different from the common “dampness warm disease”, it was a special type of “cold epidemic” mixed with “turbid dampness” (a pathogenic factor that obstructs the flow of Qi). It is characterized by heaviness, turbidity, stickiness and downward flowing), while, he named this new disease as “cold-dampness epidemic” [5]. In Tong’s opinion, SARS-CoV-2 had a cold and wet nature, which was easily enter the blood to cause blood stasis [6].

After the virus has attacked the body, disease is located in the external (contains skin surface, respiratory mucosa, digestive mucosa) in early stages of disease development. In the middle and late stages, disease is located in Taiyin Lung and Spleen. In severe cases, it affects the heart, liver and kidneys [5]. Xin’an healer Hu Guojun also believed that cold and dampness are the initiating factors of COVID-19, meanwhile, with geographically diverse, patient's clinical presentation was varying with cold and heat on the basis of dampness [7]. Dry cough is one of the most typical symptoms in this pandemic, and is also the most controversial symptom when it comes to determining the cause of the disease [8]. Doctor Hu attributed to the cough as a deficiency of lung Qi and an inability to expel phlegm [9].

SARS-CoV-2 is damp toxin, transforming into heat easily

Zhang Boli and Liu Qingshan considered this disease is a “damp toxin epidemic” caused by damp toxin, which is one of exogenous etiological factors, and can combine with cold, heat, or transform to heat, cold, dryness [10, 11]. In Wang Yuguang’s opinion, the nature of the disease is dominated by dampness and heat [12]. However, by the time the omicron strain became endemic, the disease mechanism was again dominated by wind-cold combined with dampness or dryness. This view is similar to Chao Enxiang [13]. Comprehensive COVID-19 patients with tidal fever, fatigue, poor appetite, diarrhea and other symptoms, Yang Guanlan categorized the outbreak as a “wet epidemic” [14]. Furthermore, dampness and turbidity are the main characteristics of SARS-CoV-2, and warmth and heat are the secondary characteristics. Lin Juez generalized “damp toxin” as epidemic pestilence has the nature of dampness, while in Guangzhou, China, this “damp toxin” often accompanied by dampness and heat [15].

SARS-CoV-2 is exogenous evil of damp heat, “latent dryness” as an internal cause

Cold-dampness and damp toxin are the two main perspectives on the classification of SARS-CoV-2 in etiology. Based on theory of five movements and six qi and ancient epidemic related writings, there are many different points of view.

Combining the historical lineage of epidemic disease classification and the characteristic clinical manifestations of patients described in Novel Coronavirus Pneumonia Diagnostic and Treatment Protocols, Sang Xisheng believes the etiologic attribute of SARS-CoV-2 is dryness (a pathogenic factor that consumes body fluids and tends to damage the lung), and this outbreak is a dry epidemic, so he named the disease as dry epidemic prejudice lungs [16]. By counting the proportion of symptom of digestive tract present in patients with COVID-19 in the published literature, combined with dry cough, dry mouth, and dry throat, which were present at the early stage of the disease, Fan Fuyuan considered these symptoms to be consistent with the pathogenic characteristics of dryness [17]. And that severe and critically ill patients with severe disease and rapid transmission are also consistent with the characteristics of warm fever epidemics. So he classified SARS-CoV-2 belonging to the category of “warm, heat, and dry toxins”.

Li Dengling considered the outbreak as damp heat pestilence, discriminative part of the treatment, which about light, normal, critical typing in Novel Coronavirus Pneumonia Diagnosis and Treatment Protocol (Trial Version 7), can be a modernized version of the outline of the diagnosis and treatment of damp-heat diseases [18]. Zhang Yong categorized this disease as “wood epidemic”, “latent dryness” as a potential factor [19]. Fever, dry cough, and fatigue exhibited by patients with COVID-19 are indicative of latent dryness, at the same time, with climate change there are different manifestations of entrapped dampness, cold, fire and wind.

SARS-CoV-2 is warm-humid-turbidity toxin, in severe cases, phlegm and heat accumulate and block the movement of Qi

Based on clinical practice, Xiong Jibo categorized SARS-CoV-2's etiological attributes as warm-humid-turbidity toxin, its main location is lungs, involving stomach and intestines, and has a fast transmission speed [20]. In the critical stage, patient's tongue coating is mostly yellow greasy moss or even yellow thick greasy moss, which is a sign of phlegm-heat agglomeration. Similar to Xiong, Chen Siqing believed that the nature of this virus is mainly warm-heat with a combination of damp-heat [21]. On the period of COVID-19 outbreak in Shijiazhuang, climate features were hazy and warm dry. According to this, Liu Xiaofa believed that the epidemic was caused by external infection of “turbidity toxic pathogens”, which was prone to obstructing Qi, furthermore transforming heat and injuring the fluids [22].

SARS-CoV-2 keeps mutating, symptoms vary with time of onset and geographic region

Patients with COVID-19 of Delta variant strain admitted between May 21 and June 11, 2021 in Guangdong Province were mostly elderly people. Fever, cough, sputum and greasy moss are the main manifestations. Combined with the climate characteristics of Guangzhou, which is characterized by hot summer, Zhang Zhongde concluded that SARS-CoV-2’s Delta variant was characterized by
summer heat and humidity (a pathogenic factor commonly seen between the summer solstice and beginning of autumn. It is characterized by flames ascending and dispersing), who can rapidly evolving and had a high rate of transition to critical care [23]. This is in contrast to the predominantly “wet” nature of SARS-CoV-2 reported in most regions.

An'yang, Henan Province. Pediatric patients with COVID-19 omicron diagnosed since January, 2022. The main clinical symptoms were severe fever, aversion to wind, headache, nasal congestion and runny nose, cough, and coughing up yellow-colored, thick-textured sputum. This wind heat exterior pattern represented 76.74% of total cases [24]. It can be seen that the local SARS-CoV-2 at the time was of a wind heat nature.

Ningde, Fujian Province, in April 2022. The main symptoms of patients who diagnosed with omicron mutant strain, contained cough, thirst, dry throat, nasal congestion and runny nose, pale red tongue, thin white moss. As well as spleen symptoms such as poor appetite, fatigue, heaviness of the body, sticky and greasy taste etc. [25], Quanzhou, Fujian Province, in April 2022. At essentially the same time, another study was conducted in Quanzhou, Fujian. Studies have found that in the early and middle stages of the disease, the main symptoms of patients were also dominated by wind heat exterior pattern [26]. These two studies revealed, the nature of omicron mutant strain is mainly wind heat.

These results tips us that patients with COVID-19 in the same geographic area at the same time period have similarities in presentation, this compliance with the principle of local conditions. Similarities in patient symptoms persist after onset of disease at different times and/or geographic areas, suggests that SARS-CoV-2 share common pathogenic characteristics.

As shown in Table 1, the current views of scholars on COVID-19 classification are as follows: cold epidemic, cold-dampness pestilence, damp toxin epidemic, dry epidemic prejudice lungs, damp heat pestilence, wood epidemic, warm diseases, epidemic febrile disorders, etc. Knowledge of the nature of SARS-CoV-2 contains: dampness, coldness, dryness, toxin, damp heat, latent dryness, damp-heat-turbidity toxin, summer heat and humidity, etc. Lacking of uniformity in Chinese medicine's understanding of etiologic properties of SARS-CoV-2 and the names of the diseases. it's not conducive to the transmission of Chinese medicine's experience in fighting epidemics. There is, therefore, an urgent need for clinically based practical summarizing the common pathogenic characteristics of SARS-CoV-2 through the available information will help us to better understanding of COVID-19.

The pathogenesis and evolution pattern of COVID-19 infection need to be summarised

Based on the different understanding of the etiology of SARS-CoV-2, scholars have different understanding of the evolution of COVID-19. So there are different pattern differentiation methods used in clinic, not limited on pattern differentiation of Wei-defence, Qi, Ying nutrients and blood or pattern differentiation of the three jiao. There are four main ideas described as below.

The nature of SARS-CoV-2 was cold-dampness, it can consume Yang and Qi, develop phlegm and blood stasis further

In Tong's view, the evolutionary process of the disease is dominated by injuring to Yang combined with transforming pattern, such as transformed heat or dry pattern [28]. What's more damaged Yin, led to blood stasis, or a more serious illness, like blockage pattern or collapse pattern. “Cold- dampness lead to blood stasis, stasis and heat produced in body, stasis heat entering nutrient-blood” are the characterization of the evolutionary process of the disease mechanism.

The key pathogenesis of the exacerbation is “stasis heat entering nutrient-blood”. “Lack of Qi and Yin, the remains pathogenic Qi, secondary phlegm and blood stasis develop” are main features in the recovery period. He creatively proposed a complete system of differentiation and treatment of “cold-dampness plague” and named “four stages and sixteen syndromes”. This system integrates the eight principles of identification, zang-fu organs identification, Wei-defence, Qi, Ying nutrients and blood identification, and Qi, blood and bodily fluids identification.

Catch damp toxin external, generate turbid dampness internal, develop phlegm and blood stasis further

In diagnose of COVID-19, Jiang Liangduo complementing modern imaging and physicochemical tests to four examinations of TCM [29]. He concluded the basic mechanism of disease as “lung Qi damage resulting from dampness toxin, Qi failing to control the body fluid and due to generation of dampness and turbidity, lung vessels obstructed by dampness turbidity furthermore stagnantly Qi movement, accumulation of dampness-turbidity transforms into heat or generated phlegm, Qi stagnation and blood stasis in lungs”. The transmission mechanism of disease is “dampness toxin infection of other organs through the system of triple energizers”. “Reinforce the healthy Qi (it is a collective term for physiological functions of the body, including the body's ability to adapt to the external environment, defend against pathogens and recover from diseases) in order to eliminate the pathogenic factors” is the main method of treatment.

<table>
<thead>
<tr>
<th>Scholars</th>
<th>Nature of etiology</th>
<th>Pathogenic characteristics</th>
<th>TCM disease name</th>
<th>Literature</th>
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<tbody>
<tr>
<td>Wang Yongyan</td>
<td>dryness, followed by coldness or dampness and coldness</td>
<td>Impair of Yang</td>
<td>cold epidemic</td>
<td>[4]</td>
</tr>
<tr>
<td>Tong Xiaolin</td>
<td>cold and wet</td>
<td>Impair of Yang and easily cause blood stasis</td>
<td>cold-dampness pestilence</td>
<td>[5, 27]</td>
</tr>
<tr>
<td>Zhang Boli, Liu Qingquan</td>
<td>damp toxin</td>
<td>combine with cold, heat, or transform to heat, cold, dryness</td>
<td>damp toxin epidemic</td>
<td>[10, 11]</td>
</tr>
<tr>
<td>Sang Xisheng</td>
<td>dryness</td>
<td>damages the lung and consumes body fluids</td>
<td>dry epidemic prejudice</td>
<td>[16]</td>
</tr>
<tr>
<td>Li Dengling</td>
<td>damp heat</td>
<td>heavy and turbid</td>
<td>damp heat pestilence</td>
<td>[18]</td>
</tr>
<tr>
<td>Zhang Yong</td>
<td>latent dryness</td>
<td>consumes body fluids</td>
<td>wood epidemic</td>
<td>[19]</td>
</tr>
<tr>
<td>Xiong Jibo</td>
<td>warm-heat-turbidity toxin</td>
<td>transmission speed</td>
<td>warm diseases</td>
<td>[20]</td>
</tr>
<tr>
<td>Zhang Zhongde</td>
<td>summer heat and humidity</td>
<td>had a high rate of transition to critical care</td>
<td>epidemic febrile disorders</td>
<td>[23]</td>
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In views of Wang Yuguang, the core mechanism of COVID-19 contains “dampness, toxin, heat, phlegm, blood stasis, block, syncope, collapse” [12]. Cao Enxiang believed there are stages in the evolution of the disease mechanism, while “dampness toxin stagnated Qi of lungs and spleen” is the basic mechanism, and “dampness, toxin, blood stasis, deficiency” are in central [13].

After analyzing the symptoms of more than two thousand patients who diagnosed with COVID-19, team of Tianjin university of Chinese Medicine found that cough, low-grade fever, malaise, nausea, and thick and greasy tongue fur were summarized as the main symptoms [30]. Based on this, they concluded that the core mechanism of the disease was dampness and toxin stagnation of Qi movement. At the same time, with the different regions there are combined with different characteristics, such as dampness-heat, dampness-warmth, wind-heat, dryness, cold and other. They confirm that the COVID-19 belonged to “damp toxin epidemic”.

By deeply studying the clinical characteristics of patients with COVID-19 in Guangzhou, Wang Changjun concluded that its pathogenesis were “a combination of dampness toxin and dampness-heat invading the lungs and we-defence, entering interior transform into heat, consumption of bodily fluids, even injuring nutrient-blood” [15]. Then they made innovations about pattern identification methods based on the existing system. They proposed “Wei-defence, Qi, Ying nutrients and blood combined zang-fu organs diagnostic system” as a more suitable diagnostic method for this dampness-toxin epidemic. This helps to determine the condition, analyze the location of the disease, and clarify the order of the disease transmission pattern, which plays a better role in the treatment of patients with COVID-19.

Pathogen dryness damaging the lung, consuming body fluids, generating phlegm and blood stasis

In the opinion of Sang Xisheng, “pathogen dryness damaging the lung and consuming body fluids” is core disease mechanism. Because SARS-CoV-2 invades the body and directly injures the lungs, and “dry cough” is one of the most common symptoms, so Cao Peng detailed the nature of the virus as dryness, and named the disease “lung-dryness epidemic” [31, 32]. The mechanism of COVID-2 involves both Qi and essence of the lungs, but not reach to blood aspect. The pattern of transmission is different from law of six meridians.

3.4 Warm-heat-turbidity toxin invading lungs and gastrointestinal, leading to dual deficiency of Qi and Yin finally

Warm-heat-turbidity toxin enters through the mouth and nose, invaded lungs first. Xiong believed that because of lung meridian passes through the stomach and the large intestine, so gastrointestinal disorders can be seen in clinical [33]. In sever stage, heat accumulating in the lung, high fever, shortness of breath, chest tightness, constipation, abdominal distension as the main manifestations. Even heat toxin blocking the lung, the danger syndrome of internal block and external collapse can be seen. In restoration stage, main patterns are Yin deficiency of the lung and stomach and dual deficiency of the lung-spleen. These is Xiong’s four stages and nine types of treatment method.

Zheng used a cross-sectional survey method to assess the pattern type in patients discharged from hospitals after rehabilitation in Wuhan [34]. The results show that, “dual deficiency of Qi and Yin combined with Yin deficiency with internal heat”, “deficiency of Qi with intertwined phlegm and blood stasis combined with stagnant heat” are common patterns.

As show in Table 2, most scholars believe that “dampness” is the main etiology factor in COVID-19, and play an important role in mechanism of transmission. But in other reports, the occurrence of dampness patterns is not very high, such as torpid intake, diarrhea, thick and greasy tongue [8, 17, 40]. What counts is the description about internal and external dampness are unclear.

Based on clinical symptoms, most doctors agree that the disease initially invades the lungs and spleen. But The law of pathogenesis transmission has not yet reached a unified understanding. Moreover, syndrome differentiation methods used in clinical are diverse. In the actual diagnosis and treatment of COVID-19, some doctors even innovate the syndrome differentiation system, for improving the efficiency of treatment.

TCM has laid the foundation for clinical diagnosis and treatment of unknown diseases, so in face of the sudden outbreak, TCM practitioners can learn experiences from ancient and make innovations.

The experience of TCM in the fight against COVID-19 needs to be emphasized

Despite there is no completely unified understanding of the etiological feature and pathogenetic transmission patterns, in the fight against COVID-19, different doctor gives different therapeutic regimen, but they are all useful. This experience in fight against COVID-19 is worth in-depth study.

<table>
<thead>
<tr>
<th>scholars</th>
<th>mechanism of COVID-19</th>
<th>Pattern differentiation methods</th>
<th>Literature</th>
</tr>
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<tbody>
<tr>
<td>Tong Xiaolin</td>
<td>injured Yang, combined with transforming heat or dryness, damaging Yin, leading to blood stasis, even blockage or collapse pattern</td>
<td>cold-dampness plague differentiation system four stages and sixteen syndromes</td>
<td>[5, 35, 36]</td>
</tr>
<tr>
<td>Zhang Boli</td>
<td>dampness and toxin stagnation of Qi movement; in different regions combined with different characteristics</td>
<td>integrated TCM and Western medicine</td>
<td>[10, 37]</td>
</tr>
<tr>
<td>Zhang Zhongde</td>
<td>summerheat-dampness transformed into heat, plague toxin invaded lungs</td>
<td>pattern differentiation of zang-fu organs</td>
<td>[23]</td>
</tr>
<tr>
<td>Xiong Jibo</td>
<td>Warm-heat-turbidity toxin invaded lungs and gastrointestinal</td>
<td>pattern differentiation of zang-fu organs</td>
<td>[20]</td>
</tr>
<tr>
<td>Jiang Liangduo</td>
<td>lung Qi damage resulting from dampness toxin, Qi failing to control the body fluid and due to generation of dampness and turbidity, lung vessels obstructed by dampness turbidity furthermore stagnantly Qi movement</td>
<td>state Chinese medicine</td>
<td>[38]</td>
</tr>
<tr>
<td>Chao Enxiang</td>
<td>dampness toxin stagnated Qi of lungs and spleen, combined with dampness, toxin, blood stasis, deficiency</td>
<td>pattern differentiation of zang-fu organs</td>
<td>[39]</td>
</tr>
</tbody>
</table>
For the “cold-damp” property of SARS-CoV-2, Tong emphasized the method of treatment of differenting the lung and resolving dampness in treatment on COVID-19 [41]. He developed a formula, named “Cold-Dampness Epidemic Prescription”, for cold-damp epidemics that can be used to suspected patients as well as to confirmed patients with light and common types. This formula is formed by five classic decoctions, including Maxingxigan Decoction, Shenzhuansan, Da Yuan Yin, Huoxue xiaoling decoction, Tingli Danao XieFei decoction, and play a big role in contain COVID-19.

Unlike cold-damp, Xiong Jibo emphasized the pathogenic characteristics of warm-heat evils in his diagnosis and treatment of COVID-19 [20]. The epidemic is treated in four stages. In mild stage, the main treatment method is diffuse the lung to outthrust the pathogen, SanguiYin and YinqiaoSan are used. In critical stage, the main treatment method is “clear lung fire and promote bowel movements”, Xuanbai Chengqi Decoction is the domain formula. In severe stage, patterns of “Yin exhaustion and Yang collapse” and “internal block and external collapse” may appear, then we need combine traditional Chinese and Western medicine to save lives. Shengmaisian, Shenuo Decoction can be used. In recovery stage, “supplement Qi and nourish Yin” is main method, Shashen Maidong Decoction and Huangqi Liuqinzi Decoction can be used.

Jiang Bohua takes the pleuropulmonary pragmatic interspace as the center of the disease site, release the exterior and interior [42]. In early stage, exterior pattern with wind, cold or dampness are main patterns, DayuYanin combined with HuoxiangZhenqiSan are fitted formula. In middle stage, exterior pathogen entering the interior and transforming heat, binding dampness, blood stasis, YinqiaoJiedu Decoction is needed. In severe and recovery stage, Jiang’s treatment methods is similar to other scholars.

Compliance with pattern differentiation of six meridians, Qu Jie combined acupuncture therapy with classical formula, accelerates recovery in patients and with good patient compliance [43].

Synthesizing the above information shows that, in face of the dangerous and changes rapidly severe diseases, although TCM practitioners do not have a consistent understanding of SARS-CoV-2 and COVID-19, all of them have achieved the purpose of preventing and controlling the epidemic, according to the principles of treatment based on pattern differentiation and considering factors of seasons, environment and body constitution. Thus, the similarities are summarized and the differences are separated, may contribute to our understanding of the common etiology features of SARS-CoV-2, and individual characteristics of morbidity in different regions and populations.

Discussion

Internal cause, external cause and cause neither internal nor external are the types of causes of disease categorized by TCM practitioners. Exogenous etiological factors contain six climatic exopathogens and epidemic pathogen. Zhu Weijiao (a famous doctor lived from 1884 to 1951) categorized the causes of exopathogens into organic and inorganic pathogens, of which organic pathogens include pathogenic microorganisms. Obviously, SARS-CoV-2 belongs to epidemic pathogen, is an organic pathogen.

Pathogenic microorganisms need the right environment to survive, seasons, environment and body constitution are influence factors. Thus, geographic area, climatic condition and patient symptoms are important elements in determining etiology. Especially the symptoms manifested in the earliest stages of the disease. Diseases caused by the same virus at the same time and place should have the same clinical manifestations. But in practice, after the virus attacks a person, there will be personalized patterns. COVID-19 lasts for more than four years, mutating virus, worldwide dissemination and complex symptoms involving multiple systems, all of these resulted in differences in clinicians’ perceptions of the etiologic properties of SARS-CoV-2. Because of SARS-CoV-2 can spread to the whole country or even the whole world in a short period of time, its pathogenic nature should be roughly the same. The early articles of COVID-19 shows, fever, cough and fatigue were common symptoms. While, sputum production, headache, hemoptysis and diarrhea were less common symptoms [44, 45]. In the theory of TCM, dry cough or wet cough is the key to distinguish dryness or dampness pathogenesis. And sweating is the key point to identifying whether the cause is cold or heat. The primary basis for judging the etiology is the initial clinical manifestation of the disease. The reason why scholars have different understandings of six pathogenic factors of SARS-CoV-2 may lie in the different disease stages of patients. But this has a great impact on the construction of transmission rules and treatment principles, methods and therapies, and is not conducive to the summary and inheritance of TCM’s experience in combating COVID-19.

Therefore, there are different point of views on pathogenesis of COVID-19. COVID-19 is an externally contracted disorder, for these diseases, “pattern differentiation of six meridians”, “pattern differentiation of Wei-defence, Qi, Yin nutrients and blood” and “pattern differentiation of the three jiao”, those pattern differentiation methods are often used. However, in the information that has been compiled, TCM practitioners apply more “pattern differentiation of zang-fu organs”, the reasons for this remain to be explored.

In “Wuchang model,” “Cold-Dampness Epidemic Prescription” is a “general treatment prescription” for COVID-19, and is effective in treating the clinical symptoms of COVID-19 without obvious adverse reactions. Gradually, personalized diagnosis and treatment are provided, contains three TCM drugs and three herbal formulas, moxibustion, tuina, acupuncture, music therapy based on the theory of the five elements and so on. In the fight against COVID-19, TCM is effective and safe, and there are many more treasures to be found [46].

WHO announced the end of the emergency phase of COVID-19 in May 2023, but global cumulative number of confirmed cases of new coronavirus infections are 774,699,366, of these, 7,031,216 were fatal cases, as of February 2024 [47]. From 2019 to now, SARS-CoV-2 Variants of Concern still mutating, the current dominant strain is JN.1 [1, 48, 49]. The international community urgently needs effective treatment programs.

In the fight against COVID-19, TCM has shown its unique advantages in preventing, treating, and rehabilitating [50]. Therefore, using Chinese clinical case study for the treatment of COVID-19 as a starting point, refining the similarities and differences in the clinical presentation of patients with different subtypes during the epidemic, clarification of the etiologic attribution and evolutionary patterns of disease mechanisms, developing a comprehensive understanding of COVID-19 in Chinese medicine, can further improve the theory of epidemics in Chinese medicine, and for the information of the international community.

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