



TCM Analysis and Treatment of Early Symptoms of Covid-19

Liuzhong Ye, Peilin Sun and Tianjun Wang

ABSTRACT

The novel coronavirus that causes coronavirus disease first broke out and was identified in Wuhan, China in late 2019. On 11 March 2020, based upon the fact that in a period of merely two weeks, the number of cases of Covid-19 outside China had increased 13-fold and the number of affected countries had tripled, WHO declared Covid-19 a pandemic.¹ However, sadly, no specific drugs are available to treat and prevent Covid-19 at this moment. There are some typical early symptoms, along with other less identifiable manifestations, red-flagging the presence of the illness. Early identification and management of these seemingly scattered early symptoms are extremely important in terms of controlling the spread and preventing further deterioration of Covid-19. Authors in this article attempt to explore the pathogenesis and mechanisms of these early symptoms and provide advice on relevant treatments from the viewpoint of TCM, illustrating that precise reading of all these early symptoms has significant importance in order to achieve successful TCM management in time.

Keywords: Coronavirus, SARS-CoV-2, Covid-19, pneumonia, TCM, early symptoms

The SARS-CoV-2 virus is a virus strain that causes severe acute respiratory syndrome. It is contagious in humans, and the World Health Organization (WHO) has designated the ongoing pandemic of Covid-19 a Public Health Emergency of International Concern and new outbreaks can emerge rapidly.^{2,3,4}

In terms of the contagious capacity of SARS-CoV-2, Wölfel, R. et al. have done some scientific researches and pointed out that SARS took seven to ten days after onset until peak RNA concentrations (of up to 5×10^5 copies per swab) were reached. In the present study, peak concentrations were reached before day 5, and were more than 1,000 times higher. Extended tissue tropism of SARS-CoV-2 with replication in the throat is strongly supported by the studies of sgRNA-transcribing cells in throat swab samples, particularly during the first five days of symptoms. Critically, the majority of patients in the present study seemed to be already beyond their shedding peak in upper respiratory tract samples when first tested, while shedding of infectious virus in sputum continued through the first week of symptoms. Based on the present findings, early discharge with ensuing home isolation could be chosen for patients who are beyond day 10 of symptoms

with less than 100,000 viral RNA copies per ml of sputum. These research results were published online in *Nature* on 1 April 2020.⁵

Although comprehensive testing is key to confirming coronavirus, and plays an important role in deciding on procedures of quarantine and treatment as early as possible, it is almost impossible for many countries to currently carry out this procedure thoroughly for various reasons. Iceland is the only exception as the government enables everyone in the country to be tested for the virus. The government says it spent years perfecting its approach.⁶

It therefore appears more important, in order to avoid spreading infection on a wider scale, to have full awareness of the early symptoms of Covid-19 infection in a more proactive and health monitoring sense, in addition to the common methods introduced by most countries like social distancing and self-isolating. Although most countries in the world apparently remain conservative about providing proper medical treatment of the infection in the early stages, identification and understanding of the early symptoms could determine how well the whole world copes with the outbreak and could help provide accurate information for healthcare and prevention strategies.

Manifestations of early symptoms of Covid-19 infection

While the Covid-19 pandemic is still sweeping across the world, it has only been a time span of six months since it was first identified and announced to the public in December 2019 by China. We generally still have very little knowledge about the virus. It now becomes essential that by identifying the early symptoms of the infection and carrying out some immediate tailored treatment, in order to slow down the further progress of the infection or reduce the activity of the virus replication, the impact of the infection could be greatly reduced. Since the list of most commonly reported symptoms on Covid-19 patients across the world during this pandemic is still incomplete and ongoing, we searched through the published literature globally in an attempt to give TCM's in-depth insight into it.

The Covid-19 associated early symptoms coming into people's full attention still has a long way to go. Our study indicates that the relevant symptoms include not only the commonly recognised ones like fever and respiratory manifestations next to the major flu-related symptoms, but also some digestive and urological

signs, apparent physical and mental fatigue, musculoskeletal pain or discomfort, as well as some other less identifiable symptoms like loss of taste and smell, skin rash, chilblain-like wounds and eye irritations, and different levels of nervous system impairments. Although there is a lack of an inner logical connection between each individual symptom in a Western context, these clinical manifestations have various underlining mechanisms in TCM.

Regarding the early symptoms, different countries have taken varying attitudes towards them. Symptoms of loss of smell and taste were added to the UK list of coronavirus symptoms only on 18 May, whereas previously the NHS website had sited only fever, cough and difficulty breathing as the key symptoms of Covid-19 infection and thus the trigger for NHS medical professionals to consider admission for tests and hospital treatments. This method had completely excluded all other mild symptoms in the early stages of the infection, which in our opinion, may greatly have contributed to the UK being among those having the highest Covid-19 casualties after the US, as of 18 May 2020.

In comparison, the US National Centre for Disease Control and Prevention (CDC), had emphasised those symptoms that appear 2-14 days after exposure to the virus including fever, cough, shortness of breath or difficulty breathing, chills, repeated shaking with chills, muscle pain, headache, sore throat, new loss of taste or smell.⁷

Medical researchers are taking a more systematic view over the complexity of the virus. Hussin A. Rothan summarised that the symptoms of Covid-19 infection appear after an incubation period of approximately 5.2 days. The period from the onset of Covid-19 symptoms to death ranged from 6 to 41 days with a median of 14 days.

It lists two groups of symptoms: 1. systematic disorders: fever, cough, fatigue, sputum production, headache, haemoptysis, acute cardiac injury, hypoxemia, dyspnoea, lymphopenia, diarrhoea; 2. respiratory disorders: rhinorrhoea, sneezing, sore throat, pneumonia, ground-glass opacities, RNAemia, acute respiratory distress syndrome. The article particularly pointed out that Covid-19 infection presented more symptoms of gastrointestinal symptoms like diarrhoea than other coronaviruses like SARS-CoV and MERS-CoV, and that the higher potential of digestive and urinary impact with Covid-19 infection needs attention.⁸

However, these are not adequate to cover all the symptoms especially in the very early stage of the infection, taking into account the intense battle over time against the progress of the virus. Following the development of the pandemic, there are more and more discoveries of potential signs and symptoms of the infection being reported across the world since its outbreak

globally. It is worth mentioning that some of these newly reported Covid-19 symptoms were not widely identified and reported in China. The reason for the difference between China and other countries is worth discussing in the future.

The *New York Times* reported that doctors from different countries of surging Covid-19 cases, including South Korea, Italy, Germany, UK and US, urged the awareness for doctors to screen for patients with symptoms of lost sense of smell and taste, with many cases following no noticeable nasal congestion. The percentage of the presence of anosmia among the Covid-19 positive patients is between 30-59 per cent according to different researches.^{9,10} Loss of taste or smell appeared around 24-72 hours before more typical symptoms, such as fever.¹¹

Some patients also reported rash-like frostbite or toes turning blue/purple in Italy and Spain and the Middle-East.^{12,13} But the percentage of skin rash occurrence in Covid-19 positive patients presents a big difference between the studies of China and other countries, with Western countries much higher.¹⁴

Skin changes can be found throughout the whole process of Covid-19 infections. Magro et al. studied five cases of severe Covid-19 associated respiratory failure, of which three had purpuric skin rash, and pointed out the potential key role of microvascular injury and thrombosis in the pathogenesis of Covid-19.¹⁵

There were also reports of red and irritated eyes in some cases. Cheema and Aghazadeh et al. reported the first case of Covid-associated keratoconjunctivitis in North America, presenting with red eyes and watery eye discharge without any fever and respiratory symptoms.¹⁶

The damage and impact of Covid-19 on the nervous system and particularly the brain are also raising people's concern. There have been only a few scattered published articles on the relevant CNS (central nerve system) symptoms on Covid-19 cases, although signs like nausea, headache and vomiting are commonly recorded in patients. In a review, Asadi-Pooya and Simani quoted that about 25 per cent of the Covid-19 infected patients present CNS manifestations.¹⁷ A study of 214 Covid-19 infected patients in China showed 36.4 per cent of them displayed neurological symptoms, including CNS manifestations like dizziness, headaches, impaired consciousness, acute cerebrovascular disease, ataxia, seizures, and peripheral manifestations like taste and smell impairment, vision impairment and nerve pain as well as skeletal muscle injury.¹⁸ To add some more evidence between Covid-19 and CNS impairment, a team led by Dr Oxley in the Department of Neurosurgery, Mount Sinai Health System, New York, investigated five cases of large vessel stroke over a two-week period in Covid-19

patients under 50 years of age, with either no or mild Covid-19 symptoms. This represents a sevenfold increase in what would normally be expected.¹⁹ This study implies Covid-19 may attack large vessels in a younger population to cause thrombosis and clotting at an early stage of the infection. However, it is still too early to conclude that Covid-19 leads to a higher risk of stroke in the early stage of the infection.²⁰

All these reports from all over the world, from the view of Western medicine, reflect a broad variety of different clinical symptoms in different anatomic systems. Due to the limitation of the scale and quantity of observations by individual clinicians in different countries and regions, these symptoms do, however, represent some level of similarity and coincidence, although each symptom identified is still lacking strong supporting evidence in connection with a certain pathogenesis, in terms of when and why they show up in one patient but not in others. It will, therefore, be very salient if we can find a new viewing point from which to understand this disease.

TCM's mechanisms in the early symptoms of Covid-19 infection

In fact, TCM has a much more logical line of insight into these seemingly random and scattered manifestations and all these clinical manifestations have various and intersecting underlining mechanisms. TCM treatment is thus well documented based upon these understandings.

In general, when the EPF (external pathogenic factors) enter the body, they develop and progress following certain patterns, rarely involving multiple internal organs and channels at the same time. As a result, well trained TCM practitioners can easily and promptly identify these external symptoms and signs associated with the relevant patterns. However, when it comes to a pandemic EPF, even though it appears as an external invasion pattern at the start, the pathogenic factors can rapidly fall into multiple internal organ and system disorders, creating a mixture of complications involving multiple malfunctions, of which Covid-19 is a living example.

Coronavirus pneumonia at the beginning presents a typical pattern of Cold-Damp with evil toxin. Since it is a mixture of external pathogenic factors, sharing inevitably some features of external symptoms and signs, it lays a solid foundation for a treatment principle to dispel and eliminate the external evils.

In studying this disease, it is interesting to start with looking at the climate of Wuhan, when Covid-19 first broke out in December 2019. The local weather was very rainy and wet, however with a higher average temperature than records of previous winters, with not much lack of sunlight. Reviews of tongue images of patients with Covid-19 also show the similarity of a white and greasy

coating, with not so many showing a yellow, thick and greasy coating, confirming the presence of Cold and Damp, especially at the beginning of the infection.

Taking all the early symptoms listed above into consideration, TCM's understanding of the development of EPF invasion, provides a perfect insight into the infection. *Simple Questions* Chapter 63: 'when an evil settles in the physical appearance, it will first lodge in the skin and its hair. It stays there and does not leave. Then it enters more deeply and lodges in the tertiary vessels (*sun mai*). It stays there and does not leave. Then it enters further and lodges in the network vessels (*luo mai*). It stays there and does not leave. Then it enters further and lodges in the conduit vessels (*jing mai*, channels). It links up with the five depots (*wu zang*, internal *yin* organs) internally and spreads into the intestines and the stomach. With both the *yin* and the *yang* (regions/ channels) being affected, the five depots (*wu zang*, internal *yin* organs) will be harmed.'

This chapter provides a clear pathway of the mechanisms of evil EPF's invasion into the body:

1. EPF enter the body first in stage one via the skin and the cutaneous section to disturb the *wei-qi* level;
2. EPF secondly lodge in stage two, the channel and collateral vessel level. Because the cutaneous section belongs to the *jing/luo* complex system, it is clear that stage one and two are both disorders of the channel system, a superficial level of disorder. Regarding invasion at these two early stages, if a tailored treatment to dispel and eliminate the EPF from the channel system can be applied promptly, it will cease or at least slow down the further development of the invasion, and this is the core of our emphasis on the early intervention for Covid-19 infections;
3. The invasion ends in stage three, after affecting the stomach and intestines. The invasion settles finally in the five *yin* organs (*wu zang*) and damage of the five *yin* organs (*wu zang*), leading to more severe systematic illness.

However, when considering its epidemic character, it is important to emphasise that Covid-19, although bearing the nature of external Cold-Damp factors, is not the same type of 'Cold' or 'flu' we encounter in everyday clinical practice. It occurs and progresses extremely fast, in an unusual, unpredictable, and hard to control pattern, involving much higher mortality than usual. Many patients with severe cases of infection could face death within 20 days from the start when the early symptoms appear. Therefore TCM calls it '*han shi yi* (寒湿疫)', the term *yi* (疫) means plague and epidemics. 'Evil toxin' is the name we give to describe another aspect of its pathogenesis. Due to the nature of the evil

toxin mixed with Cold-Damp, *yi*, the plague, enters the body quickly, develops and changes rapidly. Sometimes it can even skip the first two stages and collapse into stage three within a very short period, affecting organs that present symptoms of a mixture of Cold-Damp and toxic Heat.

It becomes, in consequence, even more crucial that identifying and acknowledging the first two earliest stages and properly applying relevant tailored preventive intervention is the key to winning the battle in fighting this virus infective illness.

Based on the three *yang* and three *yin* channel system, Shang Han Lun's six-channel differentiation provides a great approach to analysing Covid-19 pathogenesis. Especially when we look at the early symptoms of it, differentiation of the three-*yang*-channel enables us to have a broader view to link together all those scattered symptoms at the early stage of infection. Three-*yang*-channel system represents the individual channels of six *yang* organs (*liu fu*), lying on the outer side of the body, which serve as the defending front line against external invasion. Illnesses of the three-*yang* channel system manifest two aspects of the disorders:

1. The symptoms on body parts and areas along the distribution of the relevant channels
2. The malfunction symptoms of the relevant *yang* organs.

The three-*yang*-channel system clearly draws a line on the process of external invasion between stage one, two and stage three within which the internal *yin* organs are affected and harmed. In other words, stage three represents the three-*yin*-channel system that is stated in *Shang Han Lun*.

In addition, invasion can attack a single one or a cluster of several channels, and the *yin yang* internal-external paired channels tend to have patterns with more direct interlapping influence on each other in the process of the epidemic infection, which happens very frequently with the Covid-19 pandemic. This all adds more complexity to the disease.

The six channel differentiations related to Covid-19 early stage symptoms

***Tai yang* channel syndrome**

Aversion to cold, slight fever, headache, runny nose, loss of smell, neck pain, muscle pain or stiffness of the muscles, dry cough, tickling throat, thin, white and greasy tongue coating, superficial and slippery pulse, etc.

In Covid-19 cases, we saw a lot of patients with forehead (close to *Ex-yin tang*) and top of head pain, and upper or middle back

pain often as the very early symptoms. Watery eyes and urinary dysfunction can be related to *tai yang* syndrome too.

***Tai yang* and *yang ming* channel syndrome**

Alongside *tai yang*'s symptoms of slight aversion to cold, high fever, headache, neck pain, muscle pain, cough, carrying a mixed nature of Damp, Cold and toxic Heat, two aspects of symptoms can also present:

1. Dampness related vomit, diarrhoea of strong smell and fatigue;
2. Toxic Heat related fever, red face, restlessness, insomnia, constipation, yellow and dry coating, rapid and forceful pulse.

In Covid-19 cases, we saw patients with sudden loss of smell or taste, purple toes or chilblain patch starting on regions where stomach and large intestine meridians distribute. Because of the *yang ming-tai yin* Lung interconnection, it is common to see patients presenting skin rashes in the early stage, as well as blisters under the Damp category. It is worth mentioning that the further development of *yang ming* Heat from skin can invade into Blood, and may end in Kawasaki disease, in which inflammation of blood vessels and heart are widely involved (that is classified as a *shao yin* or *jue yin yin* depleted complication, as a later stage pattern).

***Tai yang* and *shao yang* channel syndrome**

Alternate aversion to cold and fever, headache, neck pain, muscle pain or stiffness of the muscles, cough with fullness of chest, bitter taste in the mouth, poor appetite, depression, soreness and dryness in the throat, vomiting, ataxia, thin, yellow and greasy coating, wiry and slippery pulse. In Covid-19 cases, we often saw patients with neck and shoulder pains, temporal headaches with repetitive pattern of feverish tides, red eyes or eye irritations; disturbance and blockage energy in *shao yang* can cause chest tightness and palpitation too.

***Tai yang*, *yang ming* and *shao yang* channel syndrome**

Aversion to cold, slight fever, headache, neck pain, muscle pain or stiffness of the muscles, cough, redness of the face, throat pain, bitter taste in the mouth, white and greasy coating, yellow and greasy coating, rapid and slippery pulse.

Obviously this is a combination of all the three *yang*-channel syndromes, usually an extensive development of the previous three patterns. We take this as the step prior to stage three, that red-flags the condition collapsing further.

As mentioned above, it is highly common to see *yin yang* complex patterns in Covid-19 patients in the early stage, as the evil EPF develop much faster. The most common combined *yin yang* patterns are listed below:

***Tai yang* and *tai yin* channel syndrome**

Slight aversion to cold, little fever, headache, muscle pain, cough, throat pain, tiredness, fullness of abdomen with slight pain, lack of taste, poor appetite, looser stools, or diarrhoea usually of less odour, weakness of the muscle, pale tongue, white and greasy coating, thin, weak and slippery pulse, etc.

With Damp involvement and weakened *tai yin* Spleen, patients present much more noticeable fatigue with heaviness of body, Cold limbs, and stronger and longer-lasting loss of appetite, even anosmia.

***Tai yang* and *shao yin* channel syndrome**

Aversion to cold, no fever, headache, cough, throat pain, Colder and purpler hands and feet, extreme tiredness, somnolence, weak heartbeat, semi-consciousness, pale coating, wet coating, thin, slow and weak pulse, etc.

With Cold involvement and weakened *shao yin* Kidney and Heart, patients present much more noticeable low spirit, lethargy and exhaustion, purple lips and palpitation with mild exertion. In addition, the involvement of toxic Heat can damage the *shao yin* channel and cause *yin* depletion too, featuring deep red skin rash or bleeding complications, but this is usually a later stage condition, which is not covered completely in this article. With this complex state, a critical condition will be expected to manifest soon. Therefore attention is urgently needed once this complex pattern is identified.

In addition to the six-channel differentiation by *Shang Han Lun*, *zang fu* differentiation may give more detailed analysis to the stage three development. It mainly involves the three organs: Lung, Spleen and Triple Heater at the beginning of Covid-19 infection.

Lung functions in maintaining respiration, dispersing and descending the Lung *qi*, opening into the nose, dominating the skin and regulating the Water passage. While Spleen has physiological functions in producing *qi* and Blood, transporting and transforming food and fluid, dominating the muscles and four limbs, opening into the mouth, harmonising with the Stomach, controlling the Blood circulation within the vessels. Triple Heater functions in harmonising the Three Heater, regulating the corridor of *yan qi* and Water, distributing *qi* to all parts of the body. If the *qi* distribution and Water metabolism of the Triple Heater become disturbed or blocked, Water retention could happen, which leads to various dysfunctions throughout the whole body across the different *jiao(s)*. Considering the nature of pathogenesis of Covid-19, Damp, Cold and toxic Heat, closely in connection to the disorders of body fluid and Water metabolism, we find Lung,

Spleen and Triple Heater are the most essential organs to be often involved at the beginning of the infection. Cold-Damp pathogens may dominate the beginning stage of the illness leading to disturbance and blockage of Water metabolism, toxic Heat can then dominate a later stage that burns out the body fluid leading to severe *yin* depletion. However in many fast-progressing cases, the two factors often mingle together.

The Lung becomes impaired or blocked, involving:

- Disruption of its dispersing function
Aversion to cold, or chilliness, slight fever, cough, and itching in the throat
- Failure of the Lung to open into the nose
Loss of smell, stuffy nose, runny nose and nasal bleeding
- Dysfunction of the Lung in descending the *qi*
Fast development of chest congestion, increasing pressure feeling in the chest, hypoxemia.
- Blockage of *wei qi*
Muscle pain, joint pain, sweating and sensitivity to Wind
- Disruption of its role as the upper source of Water
Rapid build-ups of fluid in the Lung, scanty urination and mild oedema.

Spleen

- Dysfunction of transportation and transformation
Poor appetite, loss of taste of food, nausea, vomiting, formation of thin and white phlegm (mucus) in the mouth, bloating of abdomen, soft or loose stool, or diarrhoea, or signs of build-up of Damp in the body, including blisters on the feet or somewhere on the body
- Poor function of *qi* and Blood production
Lassitude, fatigue, difficulty walking for a short distance, and pale complexion, and Cold hands and feet
- Lack of domination of the muscles and four limbs
Muscle weakness and lack of force in the four limbs
- Failure of the Spleen in controlling the Blood
Bruises and haemoptysis.

Triple Heater

- Disturbance of *yan qi* distribution
Tiredness, weakness, mentally fatigued lacking power to do things, in some cases even minor activities such as reading, writing, or moving for a very short distance, e.g. 20 metres, could become a challenging effort
- Blockage of the Water metabolism
Rapid Water retention in the Lung, formation of Phlegm and mucus in the Lung, or fast build-up of general Water retention, or oedema on the lower limbs and scanty urination, or even heart palpitation, shortness of breath, fullness of abdomen, or constipation.

The prognosis of the infection depends on the patient's constitution, age and underlying sickness. The invasion of Cold-Damp, toxin and Heat may enter either Cold dominant or Heat dominant directions. The Cold dominant direction takes the system to excessive accumulation of mucus in the Lung and/or Kidney system resulting in ARDS (acute respiratory distress syndrome) or Heart and Kidney failure; the Heat dominant direction takes the system to the over-burning of multiple organs resulting in general cytokine storm and multiple organ failure. By us foreseeing the possible consequence of the development of relevant pathology, a proper intervention of herbal or acupuncture treatment, as early as we can, will be able to shorten the process of the illness and avoid the further progress into critical conditions. Unlike ordinary flu, Covid-19 has a much faster and higher chance of driving the whole system into extensive crisis. From this point of view, it is no doubt that promptly identifying the early stage symptoms and managing the original pathogen with proper intervention can prevent drastic system deterioration and reduce mortality rate.

TCM's treatment of early symptoms of Covid-19 infection

The main and important focus of TCM treatment for the symptoms at an early stage of Covid-19 is to dispel the pathogenic factors, namely Cold-Damp and toxin Heat, restore the functions of Lung, Spleen and Triple Heater, and other relevant organs. We particularly want to emphasise here the application of Ghost points in acupuncture treatment. The idea of a combination of Ghost points, Lu 11 *shao shang* with Sp 1 *yin bai* comes from the ancient analogy that the evil epidemic EPF are acting as 'ghosts' into a human's body. We are also keen on the eight extraordinary Confluent points that have multidimensional actions on both the primary 12 channels and extraordinary vessels.

a. *Tai yang* channel syndrome

Principle of treatment

Dispel Cold-Damp, remove toxin, disperse the Lung *qi* and relieve external symptoms.

Herbal formula

Jing Fang Bai Du San, or *Qiang Huo Sheng Shi Tang*.

Herbal modifications

- > *Cang zhu* 10g, *huo xiang* 10g, *qing hao* 10g and *jin yin hua* 10g could be added into the formulas to strengthen the effect of eliminating Cold-Damp and Toxin.
- > In case of obvious dry cough, add *tian hua fen* 5g and *mai men dong* 10g to moisten the Lung and reduce dry cough.
- > In case of severe anhidrosis, add *ma huang* 10g and *gui zhi* 10g to promote sweating strongly and relieve the external symptoms.
- > In case of severe throat pain, add *she gan* 10g to relieve the throat pain.
- > In case of loss of smell, add *cang er zi* 10g and *xin yi hua* to open the nasal orifice and improve the smell.

- > In case of loss of taste, add *sha ren* 5g to eliminate Cold-Damp and improve the taste.

Acupuncture points

- Ghost points: Lu 11 *shao shang* and Sp 1 *yin bai*. Puncture superficially.
- Lu 7 *lie que* + Ki 6 *zhao hai*, TH 5 *wai guan* + GB 41 *zu lin qi* with even method.
- LI 4 *he gu*, GB 20 *feng chi*, TH 6 *zhi gou*, BL 13 *fei shu*, Ren 12 *zhong wan*, St 40 *feng long* and St 36 *zu san li* with reducing method.

Points modifications

- > In case of obvious dry cough, add Lu 8 *jing qu* to moisten the Lung and reduce dry cough.
- > In case of severe anhidrosis, add moxa on LI4 *he gu*, BL 13 *fei shu* and St 36 *zu san li* to promote sweating and relieve the external symptoms.
- > In case of muscle pain, add BL 58 *fei yang* and BL 60 *kun lun* to harmonise the collaterals and relieve the muscle pain.
- > In case of severe throat pain, add Ren 23 *lian quan* to relieve the throat pain.
- > In case of loss of smell, add LI 20 *ying xiang* and St 3 *ju liao* to open the nasal orifice and improve the smell.

b. *Tai yang* and *yang ming* channel syndrome

Principle of treatment

Clear Heat, remove toxin, disperse the Lung *qi* and clear the Heat.

Herbal formula

Da Qing Long Tang

Herbal modifications

- > *Cangzhu* 10g, *huo xiang* 10g, *qing hao* 10g and *jin yin hua* 10g could be added into the formulas to strengthen the effect of eliminating Cold-Damp and toxin.
- > In case of high fever, add *zhi mu* 10g and *huang qin* 10g to clear the Heat in the *yang ming* and reduce the fever.
- > In case of severe thirst, add *tian hua fen* 10g to benefit the body fluid and relieve the thirst.
- > In case of yellow phlegm, add *zhe bei mu* 10g and *niu bang zi* 10g to resolve Heat-Phlegm and reduce the cough.
- > In case of haemoptysis, add *bai ji* 10g and *xian he cao* 10g cool Blood and stop bleeding.
- > In case of constipation, add *da huang* 10g to clear the Heat and promote defecation to relieve the constipation.

Acupuncture points

- Ghost points: Lu 11 *shao shang* and Sp 1 *yin bai*. Puncture superficially.
- Lu 7 *lie que* + Ki 6 *zhao hai*, P 6 *nei guan* + Sp 4 *gong sun* with even method.

- Lu 5 *chi ze*, Bl 13 *fei shu*, Ren 17 *shan zhong*, Lu 10 *yu ji*, Li 4 *he gu*, Li 11 *qu chi*, St 25 *tian shu* and St 44 *nei ting* with reducing method.

Points modifications

- > In case of high fever, add Du 14 *da zhui* to clear the Heat and reduce fever.
- > In case of blocked nose and nasal bleeding, add Li 20 *ying xiang* to open the nasal orifice and stop the bleeding.
- > In case of loss of taste, add St 4 *di cang* to regulate the channel and harmonize the collateral to improve the tastes.
- > In case of skin red rashes or irritations (Heat oriented), add Sp 10 *xue hai* and Bl 17 *ge shu* to clear the Heat and eliminate Heat in the Blood.
- > In case of excessive yellow phlegm, add Ren 17 *shan zhong* to eliminate Phlegm and stop cough.
- > In case of haemoptysis, add Lu 6 *kong zui* to cool Blood and stop bleeding.

c. *Tai yang* and *shao yang* channel syndrome

Principle of treatment

Dispel Cold-Damp, remove toxin, disperse the Lung *qi* and harmonise *shao yang*.

Herbal formula

Chai Hu Gui Zhi Tang.

Herbal modifications

- > *Cang zhu* 10g, *huo xiang* 10g, *qing hao* 10g and *jin yin hua* 10g could be added into the formulas to strengthen the effect of eliminating Cold-Damp and toxin.
- > In case of redness of eyes or eye irritation, add *xia ku cao* 10g to clear the Heat in the Liver and relieve the eye complaints.
- > In case of severe vomiting, bitter taste in the mouth, add *xuan fu hua* 10g (packed with gauze) to descend the Stomach *qi* and relieve the vomiting.
- > In case of emotional depression, add *he huan pi* 10g to smooth the *qi* circulation and tranquillise the *shen*.
- > In case of ataxia, add *tian ma* 10g to subdue the Wind and improve the balance of the body.

Acupuncture points

- Ghost points: Lu 11 *shao shang* and Sp 1 *yin bai*. Puncturing superficially.
- Lu 7 *lie que* + Ki 6 *zhao hai*, TH 5 *wai guan* + GB 41 *zu lin qi*, P 6 *nei guan* + Sp 4 *gong sun* with even method.
- Lu 5 *chi ze*, Bl 13 *fei shu*, Lu 10 *yu ji*, GB 34 *yang ling quan*, GB 43 *xia xi* and Sp 6 *san yin jiao* with reducing method.

Points modifications

- > In case of much dry cough, add Lu 8 *jing qu* to moisten the Lung, disperse the Lung *qi* and relieve the dry cough.

- > In case of redness of eyes, or eye irritation, add TH 1 *guan chong* and Liv 2 *xing jian* to clear the Heat in the Liver and relieve the eye complaints.
- > In case of severe vomiting, bitter taste in the mouth, add GB 40 *qiu xu* and Ren 12 *zhong wan* to descend the Stomach *qi* and relieve the vomiting.
- > In case of emotional depression, add Liv 14 *qi men* and Ht 3 *shao hai* to smooth the *qi* circulation, tranquillise the *shen*.
- > In case of chest tightness or pressure over the chest, add Ren 17 *shan zhong* and P 4 *xi men* to descend the *qi*, regulate the chest and relieve the chest tightness and pressure.

d. *Tai yang*, *yang ming* and *shao yang* channel syndrome

Principle of treatment

Dispel Cold-Damp, remove toxin, clear Heat, disperse the Lung *qi* and harmonise *shao yang*.

Herbal formula

Chai Ge Jie Ji Tang.

This pattern is mostly seen in the clinic or practice. After launching the 'Screening Study of Effective Prescriptions of Traditional Chinese Medicine for the Prevention and Treatment of New Coronavirus Pneumonia' in Shanxi, Hebei, Heilongjiang and Shaanxi with a very effective therapeutic result, the State Administration of Traditional Chinese Medicine in China has encouraged applying a herbal formula named *Qing Fei Pai Du Tang* (Lung Cleansing & Detoxifying Decoction) to treat patients with Covid-19 pneumonia.

Qing Fei Pai Du Tang is a new compound formula composed of four classic prescriptions, containing pungent and Warm, pungent and Cold, and light and fragrant herbs to disperse the Lung, stop cough, clear Heat, resolve Damp and remove toxin. It contains:

<i>ma huang</i> (Ephedrae Herba)	9g
<i>xing ren</i> (Armeniacae Semen)	9g
<i>shi gao</i> (Gypsum fibrosum)	30g
<i>zhi gan cao</i> (prepared Glycyrrhizae Radix)	6g
<i>gui zhi</i> (Cinnamomi Ramulus)	9g
<i>ze xie</i> (Alismatis Rhizoma)	9g
<i>zhu ling</i> (Polyporus)	9g
<i>bai zhu</i> (Atractylodis macrocephalae Rhizoma)	9g
<i>fu ling</i> (Poria)	15g
<i>chai hu</i> (Bupleuri Radix)	16g
<i>huang qin</i> (Scutellariae Radix)	6g
<i>zhi ban xia</i> (Pinelliae Rhizoma preparatum)	9g
<i>sheng jiang</i> (Zingiberis Rhizoma recens)	9g
<i>zi wan</i> (Asteris Radix)	9g
<i>kuan dong hua</i> (Farfarae Flos)	9g
<i>she gan</i> (Belamcandae Rhizoma)	9g

<i>xi xin</i> (Asari Radix et Rhizoma)	6g
<i>huo xiang</i> (Pogostemonis Herba)	9g
<i>shan yao</i> (Dioscoreae Rhizoma)	12g
<i>zhi shi</i> (Aurantii Fructus immaturus)	6g
<i>chen pi</i> (Citri reticulatae Pericarpium)	6g

Directions

- Decoct one package of crude herbs each day and take the decoction once in the morning and once in the evening (40 minutes after a meal). If conditions permit, take half a bowl of rice soup after drinking the decoction.
- Three days of treatment constitutes one course. Usually only one or two courses of treatment are required.
- If the patient does not have a high fever, the amount of *shi tao* can be reduced, conversely, if the fever is high the amount of *shi gao* should be increased.

Acupuncture points

- Ghost points: Lu 11 *shao shang* and Sp 1 *yin bai*. Puncture superficially.
- Lu 7 *lie que* + Ki 6 *zhao hai*, P 6 *nei guan* + Sp 4 *gong sun* with even method.
- Lu 5 *chi ze*, Bl 13 *fei shu*, Lu 10 *yu ji*, Ll 4 *he gu*, Ll 11 *qu chi*, GB 20 *feng chi*, GB 34 *yang ling quan* and St 44 *nei ting* with reducing method.

Points modifications

Selections are as above patterns.

e. *Tai yang* and *tai yin* channel syndrome

Principle of treatment

Dispel Cold-Damp, remove toxin, disperse the Lung *qi* and strengthen the *tai yin*.

Herbal formula

Huo Xiang Zheng Qi San, or *Ge Gen Jia Ban Xia Tang*.

Herbal modifications

- > *Cang zhu* 10g, *qing hao* 10g and *jin yin hua* 10g could be added into the formulas to strengthen the effect of eliminating Cold-Damp and toxin.
- > In case of loss of taste, add *sha ren* 5g to eliminate Cold-Damp and improve the taste.
- > In case of severe diarrhoea, add *ge gen* 10g to ascend the clear-*qi* and descend the turbid-*qi*.
- > In case of severe tiredness, add *shan yao* 10g to activate the Spleen and tonify Spleen *qi* to improve the energy.
- > In case of bruises and haemoptysis, add *xian he cao* 10g and *bai ji* 10g to stop bleeding.
- > In case of frostbite/chilblain (Cold oriented), add *bai jie zi* 10g to *rou gui* 3g and *bai jie zi* 10g to warm the channels and eliminate blockage in the collaterals.

Acupuncture points

- Ghost points: Lu 11 *shao shang*, Sp 1 *yin bai*. Puncture superficially.
- TH 5 *wai guan* + GB 41 *zu lin qi*, P 6 *nei guan* + Sp 4 *gong sun* with even method.
- TH 6 *zhi gou*, P 6 *nei guan*, Bl 13 *fei shu*, GB 34 *yang ling quan*, Ren 12 *zhong wan*, St 40 *feng long*, St 25 *tian shu*, Sp 9 *yin ling quan*, St 36 *zu san li* with even method. Moxa on St 36 *zu san li*.

Points modifications

- > In case of severe fatigue, add Bl 20 *pi shu* and Ren 6 *qi hai* with moxa to activate the Spleen and tonify Spleen *qi* to improve the energy.
- > In case of loss of taste, add St 4 *di cang* and St 42 *chong yang* to regulate the channel and harmonize the collateral to improve the tastes.
- > In case of severe diarrhoea, add St 37 *shang ju xu* to stop diarrhoea.
- > In case of loss of appetite, add Sp 3 *tai bai* to activate the Spleen and improve the appetite.
- > In case of excessive mucus in the mouth, add Ren 22 *tian tu* to descend the *qi* and relieve the mucus.
- > In case of frostbite/chilblain (Cold oriented): moxa on *jing* Well points of nearest relevant meridians or the tip of the nearest toe.
- > In case of skin blisters, add Lu 9 *tai yuan* and Sp 3 *tai bai* to eliminate Cold-Damp in skin and muscle and relieve the skin blisters.

f. *Tai yang* and *shao yin* channel syndrome

Principle of treatment

Dispel Cold-Damp, remove toxin, disperse the Lung *qi* and tonify the *shao yin*

Herbal formula

Ma Huang Fu Zi Xi Xin Tang, or *Ma Huang Fu Zi Gan Jiang Tang*.

Herbal modifications

- > *Cang zhu* 10g, *huo xiang* 10g and *qing hao* 10g could be added into the formulas to strengthen the effect of eliminating Cold-Damp and relieve the external symptoms.
- > In case of weak heartbeat, add *gui zhi* 10g and *zhi gan cao* 10g to warm the Heart and strengthen the heartbeat.
- > In case of scanty urination, or oedema on the lower limbs, add *fu ling* 15g, *zhu ling* 10g and *ze xie* 10g to promote urination and relieve oedema.
- > In case of semi-consciousness, combination of Chinese herbs and Western medicine should be applied.

Acupuncture points

- Ghost points: Lu 11 *shao shang*, Sp 1 *yin bai*. Puncture superficially.
- Lu 7 *lie que* + Ki 6 *zhao hai*, P 6 *nei guan* + Sp 4 *gong sun* with even method.

- LI 4 *he gu* and BL 13 *fei shu* with reducing method;
BL 15 *xin shu*, BL 23 *shen shu*, Ren 6 *qi hai*, Ren 4 *guan yuan*,
Ki 3 *tai xi* and St 36 *zu san li* with tonifying method with moxa
on Ki 3 *tai xi*, Ren 4 *guan yuan* and Ren 6 *qi hai*.

Points modifications

- > In case of weak heartbeat, add BL 15 *xin shu* with moxa to warm the Heart and strengthen the heartbeat.
- > In case of scanty urination, or oedema on the lower limbs, add St 29 *shui dao* and Sp 9 *yin ling quan* to promote urination and relieve oedema.
- > In case of semi-consciousness, Ht 8 *shao fu* and Ki 1 *yong quan* with tonic method could be applied.
- > In case of hypoxaemia with difficulty inhaling, add Ki 10 *yin gu* and Ren 17 *shan zhong* to tonify the *qi*, relax the chest and improve inhalation.

CONCLUSION

In this article, we set our foot on the path of understanding the early stage of Covid-19 infections. By analysing the early symptoms of the infection from a systematic TCM point of view, we are able to obtain a comprehensive reading of the relevant pathogenesis and pathology of it and give our suggestions on the relevant treatments. We are convinced a proper early intervention of correct differential treatments strictly under TCM principles can play a very important role in controlling the infection and reducing mortality. TCM's early intervention should not be underestimated and neglected in the current pandemic situation.

TEXT REFERENCES

1. <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>
2. WHO Director-General's opening remarks at the media briefing on Covid-19 - 11 March 2020. World Health Organization (WHO) (Press release). 11 March 2020. Archived from the original on 11 March 2020. Retrieved 12 March 2020.
3. **Wee, S.L., McNeil Jr, D.G., Hernandez, J.C.** (30 January 2020). "W.H.O. Declares Global Emergency as Wuhan Coronavirus Spreads". *The New York Times*. Archived from the original on 30 January 2020. Retrieved 30 January 2020.
4. **Chan, J.F., Yuan, S., Kok, K.H., To, K.K., Chu, H., Yang, J. et al.** (February 2020). "A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster". *The Lancet*. 395 (10223): 514–523. doi:10.1016/S0140-6736(20)30154-9. PMC 7159286. PMID 31986261
5. https://www.nature.com/articles/s41586-020-2196-x_reference.pdf
6. <https://www.msn.com/en-au/news/coronavirus/iceland-is-allowing-everyone-in-the-country-to-be-tested-for-the-coronavirus-the-government-says-it-spent-years-perfecting-its-approach/ar-BB12550J>
7. <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>
8. **Hussin, A. Rothan, and Siddappa, N. Byrareddy.** The epidemiology and pathogenesis of coronavirus disease (Covid-19) outbreak. *Journal of Autoimmunity*. 2020 May; 109: 102433. Published online 2020 Feb 26. doi: 10.1016/j.jaut.2020.102433
9. https://www.nytimes.com/2020/03/22/health/coronavirus-symptoms-smell-taste.html?_ga=2.188496424.1813510712.1587638610-1648265835.1587638610
10. **Menni, C., Valdes, A., Freydin, M.B., et al.** Loss of smell and taste in combination with other symptoms is a strong predictor of Covid-19 infection. MedRxiv doi: <https://doi.org/10.1101/2020.04.05.20048421>
11. **Vaira, L. A., Salzano, G., Deiana, G., & De Riu, G.** (2020). Anosmia and ageusia: common findings in Covid-19 patients. *The Laryngoscope*. doi:10.1002/lary.2869
12. **Fernandez-Nieto, D., Ortega-Quijano, D. et al.** Comment on: Cutaneous manifestations in Covid-19: a first perspective. Safety concerns of clinical images and skin biopsies. *J Eur Acad Dermatol Venereol*. 2020 Apr 15. doi: 10.1111/jdv.16470. [Epub ahead of print]
13. **Alramthan, A., Aldaraji, W. et al** A case of Covid-19 presenting in clinical picture resembling chilblains disease. First report from the Middle East. *Clinical and Experimental Dermatology*, 2020 Apr 17. doi: 10.1111/ced.14243. [Epub ahead of print]
14. **Mahé, A., Birckel, E. et al.** A distinctive skin rash associated with Coronavirus Disease 2019. *Journal of the European Academy of Dermatology and Venereology*. 2020 Apr 15. doi: 10.1111/jdv.16471. [Epub ahead of print]
15. **Magro, C., Mulvey, J.J. et al.** Complement associated microvascular injury and thrombosis in the pathogenesis of severe Covid-19 infection: A report of five cases. *Translational Research: The Journal of Laboratory and Clinical Medicine*. 2020 Apr 15. pii: S1931-5244(20)30070-0. doi: 10.1016/j.trsl.2020.04.007. [Epub ahead of print]
16. **Cheema, M., Aghazadeh, H. et al.** Keratoconjunctivitis as the initial medical presentation of the novel coronavirus disease 2019 (Covid-19). *Canadian Journal of Ophthalmology*. 2020 Apr 2. pii: S0008-4182(20)30305-7. doi: 10.1016/j.jco.2020.03.003. [Epub ahead of print]
17. **Asadi-Pooya, A.A. & Simani, L.** Central nervous system manifestations of Covid-19: A systematic review. *Journal of the Neurological Sciences* 2020 Apr 11;413:116832. doi: 10.1016/j.jns.2020.116832. [Epub ahead of print]
18. **Roe, K.** Explanation for Covid-19 infection neurological damage and reactivations. *Transboundary and Emerging Diseases* 2020 Apr 22. doi: 10.1111/tbed.13594. [Epub ahead of print]
19. <https://www.nejm.org/doi/full/10.1056/NEJMc2009787>
20. http://www.xinhuanet.com/2020-01/28/c_1125508711.htm