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SHORT REVIEW

Conventional Therapeutic Drugs and Traditional Herbal Medicine in Prevention and Treatment of Novel Corona Virus (COVID-19): An Update

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Abstract

Background: Since December 2019, severe acute respiratory syndrome coronavirus to developing severe acute respiratory disease originated from Wuhan, China, and further spread rapidly all over the world except very few counties. On 30th January 2020, The WHO confirmed the epidemic as a community health crisis all over world. No drug was approved for treatment but some conventional and traditional medicinal plants are being used against COVID-19 infections. **Objective:** The present review is to illustrate current updates on conventional and traditional herbal medicine used for deterrent and treatment of SARS-CoV-2 infection. **Methods: S**earch engines like Scopus, Pubmed, and World Health Organization (WHO) literature on current advances about novel coronavirus (COVID-19) were reviewed. **Discussion and Conclusion:** Current research data indicated that the outbreaks caused by SARS MERS and COVID-19 have produced substantial community health problems. Currently, there are no vaccines for prevention or specific treatments however it can be managed by using oxygen therapy, convalescent plasma therapy, antimalarial drugs, and broad-spectrum antiviral drugs. Many traditional herbal and Chinese medicines may be useful.

Keywords: Conventional Drugs, COVID-19, Diagnosis, Traditional Herbal Medicine

1. Introduction

Recently (December 2019), a novel virus with the potential to cause respiratory illness like symptoms was discovered in urban center town, Hubei province, China[1]. This virus modified as a more advanced type of virus called SARS-CoV-2 is responsible for respiratory syndrome[2]. On 30th January 2020, the WHO confirmed the epidemic as a community health crisis all over the world[3]. COVID-19 infected patients were characterized by cough, fever, and different symptoms like fatigue, myalgia, and diarrhea[4,5]. On 6th May 2020, 3 595 662 were infected by COVID-19, of which, 247 652 patients died in 205 countries around the World[6]. SARS-CoV-2 speedily spread via droplet and physical contact[7]. SARS-CoV-2 is associated with nursing engulfed single-stranded ribonucleic acid (ssRNA)[8]. Coronaviruses have prominent Ribonucleic Acid (RNA) genome and their normal size ranges from 27 to 34 kilobases[9]. It may be recognized by using RTPCR (real-time polymerase chain reaction) and some extent by chest computed tomography scan. Presently, there is no medicine that has proven to be the cure for COVID-19 patients[10,11]. In the present review we have discussed the efficiency of drugs in clinical management of novel corona virus infected patients and about some medications that are recommended for curing such patients however; their efficacy has not been proven via clinical trials.

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2. Epidemiology

Since its emergence, the virus has spread to two hundred countries within 3-4 months. It originated from China but it affected most of the developed counties like the U.S., U.K., Germany, Spain, etc.[12].

3. Transmission of COVID-19

Respiratory droplets generated by sneezing and coughing can transmit it. Infected people might spread to a number of people when they come in contact. COVID-19 may also transmit by touching the contaminated surfaces and subsequently touching one's own mouth, nose, or eyes. It may spread via the feces of COVID-19 patients. Feline coronavirus (FCoV) can spread by contact feces. It has been well documented that angiotensin-converting enzyme-2 receptor mediates spreading SARS coronavirus[13].

4. Clinical Manifestations

The clinical features are inconsistent from person to person. It may be symptomatic or asymptomatic. The symptoms can be found within three to fourteen days after infection. It includes high body temperature, shortness of breath, dry cough, joints pain, diarrhea, etc.[14]. In an advanced stage, many clinical symptoms may appear like shortness of breath, persistent pressure with chest pain, blue-black lips or face, metabolism syndrome, and renal failure[15]. However, some cases may be observed as asymptomatic.

5. Diagnosis

COVID-19 patients suffer a deficiency of lymphocytes level. Whereas, many blood parameters like clotting factor time, creatinine and liver function parameters may be in high levels. Chest X-ray of COVID-19 patient usually shows bilateral infiltrates. CT scan is sensitive and specific than X-ray for the same observation. CT scans are utilized to identify symptomless COVID-19 infected patients[17].

Suspected COVID-19 patient samples are collected from the upper and lower respiratory tract by a healthcare provider. These samples are analyzed by real time reverse transcription enzyme chain reaction (rRT-PCR)[18,19] method to detect COVID-19.

6. Prevention

Coronavirus can be prevented by using many measures that include washing hands by soap for 20 to 40 seconds and by using alcohol-based sanitizer for cleaning hands. People should avoid touching eyes, nose, and mouth with unclean hands. People should avoid contact with the infected patient and should follow the social distance rule (about two meters distance). People should cover their face with tissue paper during a cough or sneeze. Disinfection should be practiced on a daily routine basis. People should home quarantine themselves when they feel unwell. If they feel feverish, are coughing or sneezing, and experience shortness of breath, they must consult general practitioners[20].

7. Treatment with Predictable Medical Care and Medicines

No drug has been discovered to cure COVID-19, however, some drugs can be used to manage COVID-19 patients. Due to the deficiency of precise antiviral drug or immunizing agent, the core treatment approach for this infection can treatment with broad-spectrum antimicrobial agents, medical care, convalescent plasma, antiviral, and corticosteroids (as shown in Table 1).

Table 1. Predictable clinical management of SARS-CoV-2 infection patients

Approaches of clinical management	Curative agents
Oxygen therapy	Invasive and non-invasive mechanical ventilation
Convalescent plasma	Convalescent plasma
Antiviral	Chloroquine Favipiravir Oseltamivir Remdesivir Interferon Ribavirin
Corticosteroids	Methylprednisolone

7.1 Oxygen Therapy

Oxygen therapy is a first-line medical care during hypoxia condition of respiratory illness of COVID-19 patients. The aim of clinical management is to maintenance saturation >90%[21].

7.2 Convalescent Plasma Medical Care

Yoo (2020) has reported that convalescent plasma could also be used for management of Corona Virus -19[22].

7.3 Chloroquine

Chloroquine, an antimalarial drug is also used in the treatment. *In-vitro* studies have suggested that chloroquine might inhibit COVID-19[23]. On 21st March 2020, the Indian Council of Medical Research has suggested that hydroxychloroquine can be used as prophylaxis.

7.4 Remdesivir

It is mainly to treat the Ebola virus. Many studies have reported that remdesivir is highly effective against the novel coronavirus in isolated cells[24].

7.5 Lopinavir and Protease Inhibitor

They are used for HIV positive patient management. Lopinavir, protease inhibitor, and ribavirin combination have a synergistic impact. Recently, it was reported that lopinavir and protease inhibitor or alone had no significant efficacy. However, a combination of these three drugs showed good efficacy[25].

7.6 Favilavir

In China, favilavir has been approved for the treatment of COVID-19. It was mainly used in the treatment of nose and throat inflammation. It may interrupt the transcription SARS-CoV-2 virus because it has an RNA genome. Recently it was accepted for the treatment of COVID-19 in some counties[26].

7.7 Steroids

Most patients recovered with steroid therapy unless critical. Steroids can be prescribed as a preventive impact at an initial stage of infection. Dexamethasone reduces fluid accumulation in the body at a normal therapeutic dose[27].

7.8 Tocilizumab

It is a monoclonal antibody and is used for treating rheumatoid arthritis. It blocks the functions of interleukin-6. It has been well documented that interleukin-6 participates as an inflammation mediator and further leading to chronic disease. Thus, this drug may be used to manage cytokine mediated respiratory diseases. Therefore, tocilizumab can make a significant effect in COVID-19 patients[28].

8. Treatment with Traditional Herbal Medicine

Out of some traditional herbal medicines, thirteen were reported to have a significant effect on COVID-19[29] and twenty-six herbs were significantly effective for the treatment of virus causing respiration metastasis infections[30]. Twenty-two, herbal extracts were analyzed and reported to have significant inhibition against Mouse Infectious disease Virus (MHV). These products might be used as anti-COVID medicine[31]. It was well documented that Litchi seed flavonoids could exploit or inhibit SARS-CoV protease because this flavonoid inhibits the peptidase activity of coronavirus[32]. Many studies mention about traditional medicines like San Wu Huangqin boiling, Lianhuaqingwen Capsule, and Yinhuapinggan grain, rule Qiao San, Yu Ping Feng San, Ma Xin Gan Shi Tang, Shuang Huang Lian - all these possess antiviral effects, which may inhibit proliferation and replication of virus mediated respiratory illness[33–36]. It was also reported that traditional Chinese flavoring medicines have significant strength to prevent and treat respiratory illness[37–39]. Further the combination drug of traditional medicinal plant with synthetic regime minimized unfavorable effects[40,41]. Novel herbal products can be isolated from traditional medicinal plants that are used for the prevention and cure of various human disorders[52]. Researchers have reported many herbal formulae containing traditional medicinal plants for clinical management of the SARS-CoV disease (Table 2).

Table 2. Treatment SARS-CoV infection by using herbal formulation

Herbal formulation	Compositions	Therapeutic effect
Yin Qiao San[42,43]	It is composed of many traditional Chinese medicine such as *Rhizoma Phragmitis, Herba Schizonepetae, Fructus arctii, Radix Platycodonis, Lonicerae, Herba Lophatheri, Fermented soybean, Radix Glycyrrhizae, Herba Menthae,* and *Fructus Forsythiae,*	Improved the functions of the upper respiratory
Yu Ping Feng San[44–46]	It is composed of many traditional medicine which includes *Astragalus membranaceus, Saposhnikoviae Radix, Astragali radix* and *Atractylodes macrocephala*,	It regulates immune system and acts as antiviral, anti-inflammatory.
Sang Ju Yin and Yu Ping Feng San[47]	It composed of *Hrysanthemum*, mulberry leaves along with six other herbs.	Its inhibited viral infection and improved immune regulation
Lian Hua Qing Wen Capsule[48]	It has many herbal ingredienst like *Glycyrrhizae, uralensis, Dryopteris crassirhizoma, Gypsum Fibrosum, Mentha haplocalyx Isatis indigotica, Forsythia suspensa, Pogostemon cablin, Rheum palmatum, Houttuynia cordata, Ephedra sinica, Rhodiola rosea, Armeniaca sibirica* and *Lonicera japonica*	It inhibited viral infection and improved immune
Shuang Huang Lian[49]	It is made by using herbs like Forsythia Suspense, *Lonicera japonica, and Scutellaria baicalensis*,	It inhibited SARS-CoV-2 and improved immunity
Ma Xin Gan Shi Tang [50,51]	It is also combinations of many herbs which includes *Anemarrhenae rhizoma*, *Ephedrae herba*, *Dioscoreae rhizoma*, *Glycyrrhizae raadix*, *Gypsum fibrosum*, *Arecae semen*, *Magnoliae officinalis* cortex, *Tsaoko fructus*, Da Yuan Yin, *Scutellariae radix* and *Armeniacae semenamarum*	It assisted to air away vintilation passage to the lung and have anti-SARS-CoV activity

As we know, COVID-19 is modified from SARS-CoV, so these drugs may also be used for the treatment. It was found that 3- chymotrypsin-like proteolytic enzyme (3CLpro) plays a significant role in virus replication. So, this enzyme has been targeted by using some natural products for clinical management of SARS-CoV. Many scientific studies indicated that traditional Chinese medicines extract has significant potential to reduce the proteolytic enzyme 3CLpro activity[53]. *Houttuynia cordata* extract[54,55] and litchi seeds were used for the extraction of flavonoids which have significantly inhibited respiratory syndrome[56,57]. These natural products are significantly inhibiting 3CLpro enzyme leading to the treatment against respiratory infections[58,59]. It has also been reported that many flavonoids specifically like isobavaschalcone, herbacetin, 3-β-D-glucoside, and quercetin significantly impair the proteolytic enzyme 3CL activity of MERS-CoV[60]. Yu et al. have documented well about natural product scutellarein and myricetin, which have powerfully impaired helicase enzyme of SARS-CoV[61]. Whereas, helicase enzyme helps replication of the virus. Wu et al. carried out huge- level screening of drugs, traditional medicinal plant products, and synthetic drugs for their effectiveness against SARS-CoV through virus and Vero E6 cell line assay. They found that ginsenoside-Rb1, aescin of horse chestnut, Sandril, and Japanese honeysuckle were inhibiting replication of SARS-CoV[62].

9. Conclusion

It is concluded that the novel coronavirus (COVID-19) is extremely infectious and it spreads via droplets from person to person. It may be prevented by personal quarantine and maintaining social distance to break the cycle. Currently, there are no specific vaccines reported till now, but this infection might well be treated by predicable medical aid, drugs, some traditional flavoring medication.

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