



## A clinical approach to COVID-19

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### ABSTRACT

The Corona Virus COVID-19 pandemic is the defining global health crisis emerging these days and the most significant challenge faced since World War Two. Corona Virus disease 2019 (COVID-19) is defined as an illness caused by a novel Corona Virus now called severe acute respiratory syndrome Corona Virus 2 (SARS-CoV-2), which was first identified due to outbreak of respiratory illness cases in Wuhan City, China. The most common symptoms include dry cough, fever and tiredness. Some may also develop aches and pains, nasal congestion, runny nose, sore throat or diarrhoea. There are no drugs or other therapeutics approved by the US Food and Drug Administration to prevent or treat COVID-19. Both ancient, as well as modern therapeutic procedures, can be adopted for COVID -19. Current advanced clinical management includes infection prevention and control measures and supportive care, including supplemental oxygen and mechanical ventilator support depending upon the condition. On the other hand, Ayurveda is equipped with a variety of treatment protocols including Dincharya (daily regime), Rutucharya (seasonal regime), Pranayama (Breathing exercise), and various Panchakarma (Purification) procedures.



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### INTRODUCTION

Corona Virus disease 2019 (COVID-19) is defined as an illness caused by a novel Corona Virus which was first identified amid an outbreak of respira-

tory illness cases in Wuhan City, China. On January 30th, 2020, the WHO declared the COVID-19 epidemic a global health emergency. On March 11th, 2020, the WHO announced COVID-19 a global pandemic, its first such designation since reporting H1N1 influenza a pandemic in 2009. Illness caused by SARS-CoV-2 was recently termed COVID-19 by the WHO, so derived from "Corona Virus disease 2019." All over the world total, 1,521,966 cases of the corona were reported of which 332,310 have recovered with 88,659 deaths (Hui *et al.*, 2020).

CoVs are positive-stranded RNA viruses with a crown-like appearance under an electron microscope. SARS-CoV-2 belongs to the beta CoVs category. It has a round/elliptic form. Like other CoVs; it is sensitive to ultraviolet rays and heat. Furthermore, these viruses can be effectively inactivated by lipid solvents, including ether (75%), ethanol,

and chlorine-containing disinfectant and chloroform (Cascella *et al.*, 2020).

### Therapeutic Procedure

As the world continues to try to control the spread and impact of the Corona Virus disease 2019 (COVID-19), there is an increasing focus on the care and treatment of symptomatic patients who are SARS-CoV-2 positive. There are currently no FDA-approved medications for the treatment or prevention of COVID-19. However, drugs that are approved to treat other diseases may be useful and are presently being used and studied.

The clinical management of COVID 19 includes screening and triage, i.e. early detection of patients, implementation of appropriate IPC measures, collection of samples for investigation, symptomatic treatment, oxygen therapy and monitoring, prevention of complications, adjunctive therapy. Safety and efficacy for these drugs are not yet established in patients with COVID-19. Patients receiving Hydroxychloroquine, Chloroquine and Azithromycin for FDA-approved uses have reported difficulty in filling their prescriptions, presumably because the drugs are being used to treat COVID-19.

## MATERIALS AND METHODS

### Clinical approach as per modern science includes

#### Screening and Triage

Screen and isolate all patients suspected with COVID 19 at the first point of contact with any health care system. Consider Covid 19 as possible aetiology of the patients with complaints of acute respiratory illness under certain conditions. Triage patients using standardised triage tools and start first-line treatment. The presence of viruses in samples is confirmed by RT-PCR, which detects the Corona Virus' RNA. This test is specific and is designed to detect the RNA of the SARS-CoV-2 virus. It is used to confirm recent or acute infections.

Detection of antibodies can be used both for diagnosis and population awareness. Antibody tests show how many people have had the disease, including those whose symptoms were minor. An accurate mortality rate of the disease and the level of herd immunity can be determined from the results of this test (World Health Organization, 2020b).

#### Immediate implementation of IPC [Infection Prevention and Control] measures

It has been adapted from WHO's Infection prevention and control, during health care for probable or confirmed cases of Middle East respiratory syn-

drome Corona Virus (MERS-CoV) infection, based on current knowledge of the situation in China and other countries where cases are identified, and experiences with the severe acute respiratory syndrome (SARS)-CoV and MERS-CoV.

1. Initiate IPC at the point of entry of the patient to the hospital. Screening should be done at the first point of contact at the emergency department or outpatient department/clinics. Suspected COVID-19 patients should be given a mask and directed to a separate area. Keep at least 1 m distance between suspected patients.

2. Standard precautions should always be applied in all areas of health care facilities. Standard precautions include hand hygiene and the use of personal protective equipment (PPE) when in indirect and direct contact with patient's blood, body fluids, secretions (including respiratory secretions) and non-intact skin. Standard precautions also include prevention of needle-stick or sharps injury; safe waste management; cleaning and disinfection of equipment; and cleaning of the environment (Contaminated, 2020).

3. In addition to standard precautions, health care workers should do a point-of-care risk assessment at every patient contact to determine whether additional precautions (e.g. droplet, contact, or airborne) are required (Training, 2020).

#### Remdesivir

Remdesivir is an investigational intravenous drug with a broad antiviral activity that inhibits viral replication through premature termination of RNA transcription and has in-vitro activity against SARS-CoV-2 and in-vitro and in-vivo action against related beta Corona Viruses. Remdesivir is an investigational antiviral drug being developed by Gilead Sciences for the treatment of Covid-19, a Corona Virus disease, and Ebola virus infection. (Saha *et al.*, 2020).

The drug is currently not approved for any indication globally. The US Food and Drug Administration (FDA) reviewed the investigational new drug (IND) application filed by the company for Remdesivir to treat Covid -19 and granted experimental study the drug in February 2020.

The drug is supplied as a stable formulation for intravenous administration during clinical development. Remdesivir inhibited the ability of the Corona Viruses that cause SARS and MERS to infect cells in a laboratory dish. The drug also was effective in treating these Corona Viruses in animals. There was a reduction in the amount of virus in the body, even an improvement in lung disease caused by the virus (Eastman *et al.*, 2020).

The drug appears to be effective in the laboratory dish, in protecting cells against infection by the COVID virus. Remdesivir was used in the first case of COVID-19 that occurred in Washington State, in January 2020. The patient was severely ill but survived. Of course, experience in one patient does not prove the drug is effective ([Herper, 2020](#)).

### Hydroxychloroquine and Chloroquine

Hydroxychloroquine and Chloroquine are oral prescription drugs that have been used for the treatment of malaria and certain inflammatory conditions. Hydroxychloroquine and Chloroquine are under investigation in clinical trials for pre-exposure or post-exposure prophylaxis of SARS-CoV-2 infection, and treatment of patients with mild, moderate, and severe COVID-19 ([Ben-Zvi et al., 2012](#)).

No drug is perfectly safe, but these drugs are quite safe when used for just the several days they might be needed to treat COVID-19. They are also cheap, already available at our local drug stores, and relatively free of side effects. There is strong evidence that both drugs kill the COVID-19 virus in the laboratory dish. The drugs appear to work through two mechanisms. First, they make it harder for the virus to attach itself to the cell, inhibiting the infection from entering the cell and multiplying within it. Second, if the virus does manage to get inside the cell, the drugs kill it before it can reproduce ([Yao et al., 2020](#)).

One report, published in February 2020, claimed that Chloroquine had been used in more than 100 patients in China who had COVID-19. The scientists stated that their results demonstrated that Chloroquine is superior to the control treatment in inhibiting the worsening of pneumonia, improving lung imaging findings, eliminating the virus from the body, and shortening the duration of the disease ([Gao et al., 2020](#)).

### Hyperbaric oxygen therapy

Hyperbaric oxygen therapy (HBOT) treatment is provided to patients as an adjunct to standard therapy for COVID-19-positive patients with respiratory distress. All patients before the clinical application of HBOT will be evaluated by the primary care team and hyperbaric physician.

This is a single-centre prospective pilot study to evaluate the safety and efficacy of hyperbaric oxygen therapy (HBOT) as an emergency investigational device for treating patients with Corona Virus, disease, COVID-19. Patients that meet inclusion criteria will be asked to give consent by the hyperbaric physician. They will then be transported from

the ED or other unit to the hyperbaric unit maintaining airborne precautions based on the most current hospital protocol. All study personnel will have proper PPE at all times. The patient will then be placed into the mono-place chamber, and when the chamber door is closed, the patient will remove any respiratory filter/mask that was placed. The patient will receive 90 minutes of hyperbaric oxygen at 2.0 ATA with or without air-breaks per the physician. Upon completion of the treatment, the patient will then return to the medical unit and continue all standard of care. Additional treatments (up to 5) can be given if warranted and agreed upon by the patient and all members of the team caring for the patient ([Chander et al., 1999](#)).

### Convalescent Plasma Therapy

Convalescent Plasma Therapy, plasma from a COVID-19 recovered patient, is transfused into an infected patient. The antibodies present in the plasma of the recovered patient help in neutralising the SARS-CoV-2 virus in the infected patients. CONVALESCENT PLASMA THERAPY plasma from a COVID-19 recovered patient is transfused into an infected patient. The antibodies present in the plasma of the recovered patient help in neutralising the SARS-CoV-2 virus in the infected patient ([Lu et al., 2016](#)).

Though convalescent plasma has been used for many years, and with varying success, not much is known about how effective it is for treating COVID-19. There have been reports of success from China, but no randomised, controlled studies (the gold standard for research studies) have been done. Experts also don't yet know the best time during the illness to give plasma ([Chen et al., 2020](#)).

On March 24th, the FDA began allowing convalescent plasma to be used in patients with severe or immediately life-threatening COVID-19 infections. This treatment is still considered experimental.

To donate plasma, a person must meet several criteria. They have to have tested positive for COVID-19, recovered, have no symptoms for 14 days, currently test negative for COVID-19, and have high enough antibody levels in their plasma. A donor and patient must also have compatible blood types. Once the plasma is donated, it is screened for other infectious diseases, such as HIV.

Each donor produces enough plasma to treat one to three patients. Donating plasma should not weaken the donor's immune system nor make the donor more susceptible to getting reinfected with the virus ([Tanne, 2020](#)).

### Ibuprofen

Some French doctors advise against using ibuprofen (Motrin, Advil, many generic versions) for COVID-19 symptoms based on reports of otherwise healthy people with confirmed COVID-19 who were taking an NSAID for symptom relief and developed severe illness, especially pneumonia. These are only observations and not based on scientific studies.

The WHO initially recommended using acetaminophen instead of ibuprofen to help reduce fever and aches and pains related to this Virus infection, but now either acetaminophen or ibuprofen can be used. Rapid changes in recommendations create uncertainty. Since some doctors remain concerned about NSAIDs, it still seems prudent to choose acetaminophen first, with a total dose not exceeding 3,000 milligrams per day. Ibuprofen boosts the angiotensin-converting enzyme 2 (ACE2), which may facilitate and worsen COVID-19 as a result, WHO initially warned most patients to stick with acetaminophen, which is also known as Paracetamol or Tylenol.

However, if you suspect or know you have COVID-19. You cannot take acetaminophen, or have taken the maximum dose and still need symptom relief; taking over-the-counter ibuprofen does not need to be specifically avoided ([World Health Organization, 2020a](#)).

### Vitamin C

Some critically ill patients with COVID-19 have been treated with high doses of intravenous (IV) vitamin C in the hope that it will hasten recovery. However, there is no clear or convincing scientific evidence that it works for COVID-19 infections, and it is not a standard part of treatment for this new infection. A study is underway in China to determine if this treatment is useful for patients with severe COVID-19; results are expected in the fall. ([Peng, 2020](#)).

The idea that high-dose IV vitamin C might help in overwhelming infections is not new. A 2017 report found that high-dose IV vitamin C treatment (along with thiamine and corticosteroids) appeared to prevent deaths among people with sepsis, a form of overwhelming infection-causing dangerously low blood pressure and organ failure. Another study published last year assessed the effect of high-dose vitamin C infusions among patients with severe infections who had sepsis and acute respiratory distress syndrome (ARDS), in which the lungs fill with fluid. While the study's primary measures of improvement did not improve within the first four days of vitamin C therapy, there was a lower death rate at 28 days among treated patients ([Boretti and Banik, 2020](#)).

Though neither of these studies looked at vitamin

C use in patients with COVID-19, the vitamin therapy was given explicitly for sepsis and ARDS, and these are the most common conditions leading to intensive care unit admission, ventilator support, or death among those with severe COVID-19 infections. Regarding prevention, no evidence taking vitamin C will help prevent disease with the Corona Virus that causes COVID-19. While standard doses of vitamin C are generally harmless, high doses can cause several side effects, including nausea, cramps, and an increased risk of kidney stones.

### HIV Drugs Combination

Drugs developed to treat HIV are used in the treatment of other viral diseases such as hepatitis B. They have also shown substantial clinical benefit in the treatment of emerging diseases such as severe acute respiratory syndrome, or SARS, which is caused by a Corona Virus similar to that which causes COVID-19. In the race to find effective treatments or a cure for COVID-19, researchers are now testing antiretrovirals used to treat HIV such as Lopinavir, Ritonavir, and another protease inhibitor called Darunavir.

There is anecdotal evidence to suggest that anti-HIV drugs may be effective. Thai doctors gave Lopinavir and Ritonavir in combination with a flu drug to a coronavirus patient, who tested negative for the virus within two days. In Japan, a patient from Wuhan, China, was treated with just the two HIV drugs and her fever subsided within five days of being admitted to the hospital. And a report in the journal JAMA in March 2020 showed that three of five patients recovered after being treated with the same two drugs.

These reports are encouraging, but public health experts caution that more testing is needed before concluding that HIV drugs can effectively treat COVID-19.

### Clinical approach as per ancient science includes

#### Tulsi leaves

Tulsi leaves are consumable and are being used to normalise Kapha (humour in the body) and Vata (humour in the body). Tulsi is being used in the management of pain diarrhoea cough and fever, which are common symptoms of COVID 19. The leaves, along with cow's ghrita (Ghee) were described for the management of pneumonia. There exists a piece of strong scientific evidence for the antiviral effect of Tulsi. Clinical trials conducted earlier in India where the extract of Tulsi leaves was administered for patients with viral hepatitis and encephalitis. Interestingly there was an increase in survival and symptomatic improvement in Tulsi group when compared with controls. Another study

proved improvement in respiratory parameters and relief from symptoms of asthma with three days of consumption of Tulsi leaves.

Tulsi consumption increases the antioxidant molecules and enzymes in the body and protects the cell and its membrane from being damaged by the toxic substances. Tulsi boosts the immunity and helps to defeat the dangerous virus and bacteria (Goothy *et al.*, 2020).

### **Dinacharya (as a preventive measure)**

This is a period to go within so that we can follow our Dinacharya [daily routine]. Wake up early in the morning, brush your teeth, scrape your tongue, rinse your mouth and drink hot or warm water. Have ginger, cinnamon and cardamom tea, regular chai made with Tulsi (holy basil, one or two leaves), or even mint, cinnamon and cardamom tea. These herbal teas boost energy.

As long as we keep our Agni (digestive fire) strong, then illness will not happen to us. So, Ayurveda has a great way of prevention as to how we can prevent being affected by the Corona Virus. Keep your Agni strong and, to do that, follow your Dinacharya. It is the first important thing that Ayurveda recommends.

For Dinacharya, you wake up in the morning, scrape your tongue and brush your teeth. Drink a glass of warm water then do Pranayama. There is a package of eight [beneficial] Pranayama exercises: Bhastrika, Kapala Bhati, Anuloma Viloma, Brahmari, Utjayi, Utgeet, and finally Sheetali and Sheetkari. Just by doing this package of eight Pranayama, we can strengthen our immune system, including our Pranavaha Srotas (respiratory system). Rasavaha srotas (lymphatic system) will be cleansed, and that way we can boost our energy. This will maintain the balance of ojas (immunity, strength), Tejas (digestion both subtle and gross), and prāna (vital life force).

And there are simple herbal remedies that Charaka has mentioned. Even though there is no common cold, Charaka says that you should take sitopaladi, talisadi, abhrak bhasma, and mahasudarshan churna (Ayurvedic Herbal medicines). Take this preparation,  $\frac{1}{2}$  teaspoon three times a day or twice a day, every morning and evening. If you are tired, you may not want to do that. You can make a chai and just put a pinch of Sitopaladi or pinch of Talisadi into the chai (tea). It will give a wonderful flavour to the drink (Lad, 2020).

### **Surya Namaskara (Salute to the sun)**

We can clean our Pranavaha srotasa, our respiratory system and it will give us a boosting of energy so that we can keep away the virus. Another unusual

health-supporting practice is to do some Yogasana (poses in Yoga)- camel pose, cobra pose, cow pose, boat, bow, and bridge pose, locust, lotus, and lion pose. If you think that is too complicated, just do Surya Namaskara.

For Surya Namaskara, do a minimum of 7 rounds and a maximum of 12 rounds. We do 7 rounds because there are seven dhatus (bodily tissues). There are 12 essential poses in Surya Namaskara. So, do 12 or 7 Surya Namaskara and then do Pranayama and then sit for meditation. For meditation, you can do So' Hum meditation. For this, sit quietly in lotus pose, siddhasana pose (accomplished) or sahasana pose (easy), and inhale with the sound "so" in your mind and exhale with the sound "hum". This is a great opportunity. When you do this So' Hum meditation, you will flower the inner joy, the inner beauty. Then sit quietly and feel your presence (Pratinidhi, 1928).

Ramdev baba [Famous Yoga Teacher in India] also added that people should do Pranayama - deep breathing, kapalabhati and anulom vilom to increase immunity. It will work best to protect children from the virus.

### **Chyawanprash [Ayurvedic Herbal medicine]**

As people rush to keep themselves protected, Ayurveda experts have stressed that medicinal herbs such as Amla, Giloy, Shilajit and Neem help strengthen the immune system, which is key to fighting the deadly virus. Eating a tablespoon of Chywanprash daily enhances immunity, and it may help prevent the spread of the virus, according to Ayurveda experts.

We all know that strong immunity is necessary to fight any kind of foreign body or disease. Corona Virus primarily affects the lungs and the respiratory system. Eating a tablespoonful of Chywanprash daily enhances the immunity, specifically that of lungs and the respiratory system. Amalaki or Amla (*Emblica Officinalis*), Guduchi/Giloy (*Tinospora Cordifolia*), Neem (*Azadirachta Indica*), Kutki (*Picrorhiza Kurroa*), Tulsi (Holy Basil) are some of the Ayurvedic herbs that help build the immunity and prevent the infection. It is meant to restore drained reserves of life force (ojas) and to preserve strength, stamina, and vitality while stalling the course of ageing. Chywanprash is formulated by processing around 50 medicinal herbs and their extracts, including the prime ingredient, Amla (Indian gooseberry), which is the world's most abundant source of vitamin C.

A regular intake of it strengthens the trachea-bronchial tree and hence improves the immunity and functioning of the respiratory system. It helps to

treat respiratory infections, allergic cough, asthma, bronchospasm, rhinitis, seasonal or non-season respiratory disorders, common cold, and tuberculosis, and thus strengthens the respiratory system. It is also used as an adjunct to anti-tubercular drugs to augment their bioactivity and prevent their effects ([What Ayurveda has to offer on fight against Corona Virus, 2020](#)).

### Rasayana

Rasayana may be employed for fulfilling both of protection and promotion of health and curing the diseases. Rasayana is one of its eight branches being practised since time immemorial. Proper Rasayana therapy done with medicines that are collected before the onset of epidemic disease restores physical health. Rasayana drugs are those medicines which are capable of imparting superior Rasas and Dhatus to the body and toning up the system of healthy persons. Rasayana aid in increasing natural immunity, enhancing general wellbeing, improving the functioning of all fundamental organs of the body and keep the signs of early ageing at bay. The primary purpose of Rasayana therapy is to impede the ageing process and to delay the degenerative process in the body. Rasayana is the term given to special herbs, fruits or any other form of medication that are known to promote positive health and longevity ([Goyal, 2018](#)).

Truthfulness, compassion for living beings, donation, charity, prayer to the gods, and good deeds, adoption of preventive measures, tranquillity, and protection of the self by Mantra etc. are very effective. Devotion towards God, residence in auspicious localities, observance of Brahmacharya, and service to those observing Brahmacharya are told as a remedy. Discussion on religious scriptures, befriending great sages, who have self-control, who follow a religion, who are Satvika and who are learned, people. These therapies, which, when adopted during epidemic disorders, can easily save lives of individuals provided the epidemics can easily save the lives of individuals provided the death of a particular individual is not pre-determined.

### CONCLUSION

As the spread of COVID -19 is increasing day by day throughout the world and creating a problematic situation for people. It has nearly affected more than 3.04 million people across 184 countries. Some countries have developed vaccines against the disease. On the other hand, many are trying to rule out a way to recover from this situation. Recommended measures to prevent infection include frequent hand washing, maintaining physical distance from others,

covering coughs, and keeping unwashed hands away from the face. Besides, the use of a face covering is recommended for those who suspect with the virus.

People are managed with supportive care, which may include fluid therapy, oxygen support, and supporting other affected vital organs, The CDC recommends that those who suspect they carry the virus wear a simple face mask. Extracorporeal membrane oxygenation (ECMO) has been used to address the issue of respiratory failure, but its benefits are still under consideration. Personal hygiene and a healthy lifestyle and diet have been recommended to improve immunity. Supportive treatments may be useful in those with mild symptoms at the early stage of infection.

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