



ISSN 2456-3110

Vol 5 · Issue 5

Sept-Oct 2020

Journal of  
**Ayurveda and Integrated  
Medical Sciences**

*www.jaims.in*

# JAIMS

An International Journal for Researches in Ayurveda and Allied Sciences



**Charaka**  
Publications

Indexed

# Understanding Covid-19 in the light of Ayurveda

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## ABSTRACT

In the era of globalization, peoples across the world live under the threat of the corona virus. Though the mortality rate is not very high but the number of people having SARS-CoV-2 infection is rising and peoples are lockdown in their own houses and it creates huge loss in terms of human resource, finances and many more. Ayurveda is an ancient science which tells about the preventive and curative treatment of diseases through various *Samhitas*. To prepare the review the references from *Brihatrayee*, (*Charak Samhita*, *Sushrut Samhita*, *Ashtang Hridayam* and *Ashtang Sangraha*) has been used and extensive search through internet for references from various articles and websites has been done regarding COVID 19. This article is a sincere effort to explore this new disease through scattered references all over *Samhitas*. As SARS-CoV-2 primarily affects the mucous membrane of nose to enter in the body and affects respiratory system mainly lungs. So exploration of this disease in Ayurveda in the background of basic principles of Ayurveda.

**Key words:** Ayurveda, COVID 19, Saam Dosha, SARS-Cov-2, Vyadhikshamatva.

## INTRODUCTION

Corona viruses are a large family of viruses belongs to Corona virus family. The word corona means crown, protein spikes presents over the virus make it look a crown like, and that's why it is named as Corona. Viruses are zoonotic meaning they can transmitted between animals and humans causes illness ranging from common cold to more severely diseases such as SARS-CoV, MERS-CoV, out of that SARS-CoV in 2002 was transmitted from civet cats to humans and MERS-CoV in 2012 was transmitted from camels to humans. Both the viruses SARS-CoV and MERS-CoV primarily

comes from BAT. Currently it is believed that 2019 - N-CoV transmitted from pangolin to humans.<sup>[1]</sup>

COVID-19 is an illness caused due to Novel Corona virus 2019. The first case was reported in the Month of December 2019 in Wuhan city of china.<sup>[1]</sup> The novel corona virus 2019 is single strain RNA virus and due to its similarity with the SARS (Severe Acute Respiratory Syndrome) in symptoms and pathophysiology now it is called SARS-CoV-2 (Severe Acute Respiratory Syndrome Corona Virus - 2).

Though the mortality rate is less than SARS<sup>[2]</sup> (2002) and MERS<sup>[3]</sup>(2012) at present, which is 11% and 34 % respectively whereas the mortality rate of SARS-CoV-2 (2019)<sup>[4]</sup> is 3.4 %.

The spreadability of SARS-CoV-2 is believed to be 2-3 that means if a person infected with SARS-CoV-2 can transmit it to 2-3 people whereas it is not the case in influenza where the spreadability is 1.3.

Due to no curative treatment availability and high spreadability world Health organisation declared it a Pandemic on March 11, 2020, as it has confirmed its presence in all continents except Antarctica.

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Submission Date: 07/09/2020 Accepted Date: 12/10/2020

### Access this article online

#### Quick Response Code



Website: [www.jaims.in](http://www.jaims.in)

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### Transmission

SARS-CoV-2 was transmitted from animal to human. The spread of SARS-CoV-2 can be happen by;

- Air borne
- Close Contact
- Contaminated Surfaces
- Faecal-oral transmission

The incubation period of SARS-CoV-2 is ranged from 2 to 14 days. Recent articles stated about asymptomatic carriers.<sup>[5]</sup>

### Symptoms

The main symptoms of disease COVID-19 are fever, cough and Shortness of breath.<sup>[6]</sup> As per the article published in The Lancet, prevalence rate is more in males (75%) than that in females (27%). Among these COVID-19 patients the median age is 49years. Only 32% patients having any underlying comorbidity.

- Fever appears in 90% cases.
- Cough in 76% cases.
- Shortness of breath in 55% cases.<sup>[6]</sup>

Apart from these symptoms conjunctivitis and Anosmia / Hyposmia also noticed.

In a journal of medical virology study of 30 Patients hospitalized with COVID -19 in china only 1 have conjunctivitis and 29 others had SARS-CoV- 2 Particles in their ocular secretions.<sup>[7]</sup> This suggests that virus can affect conjunctiva without any major symptoms.

In a large study published in the New England Journal of Medicine, conjunctival congestion documented in 9 of 1099 patient (0.8%) with confirmed COVID-19 patient in 30 hospitals across china.<sup>[8]</sup> Anosmia is also reported in COVID -19 positive patients in South Korea, China and totally approximately 30% in South Korea. Apart from these upper Respiratory tract infection like runny nose, sneezing and gastro intestinal symptom like diarrhoea is also noted in few cases of COVID - 19 Patients.

### Patho Physiology<sup>[9]</sup>

SARS-CoV-2 Mainly enters in the human body through respiratory tract and attaches to mucus membrane of nose and Mouth primarily.

The spike present on the virus known as S- protein spike attaches to the ACE-2 receptor of Type II Pneumocytes of Alveoli and enters inside the alveoli and releases its RNA. And by translation process multiply in numbers by the help of proteinases enzyme.

By damaging Type II Pneumocytes. This cells releases inflammatory mediators and invites macrophages and macrophages release the cytokines majorly like IL-1, IL- 6, TNP - a. This cytokines Comes in the blood stream and causes vasodilation and increases the capillary permeability and leaking of fluid in the tissue space which mount the pressure to Alveoli and produces Alveolar oedema which further leads to increase in surface tension and finally results in alveolar collapse. This cause hypoxemia and produce symptoms shortness of breath.

This inflammation and constant low level of oxygen in the blood stream leads to consolidations of alveoli with macrophages, neutrophils and debris of type I and type II pneumocytes. Constant release of IL- 1, IL- 6, TNF - alpha circulates in blood and in response to high quantity of cytokines hypothalamus releases prostaglandins which produces hypothermia and appears as a fever symptom. If this condition continued without any intervention it causes SARS severe acute respiratory syndrome which can leads to death by hypo perfusion of organs and alter vital organ activity which ultimately leads to death.

### Causative factor for disease in Ayurveda

Pandemics in Ayurveda can be correlated with *Janapadodhwamsa*<sup>[10]</sup> catastrophe of population due to polluted air, water, *Desha* (place), *Kaala* (time). The causes are *Pradhanik Hetus* (important causative factors) and affect a population at a time with same sign and symptoms. Storms can devastate a particular region (*Janpada*). The basic cause for *Janapadodhwamsa* is *Adharma*<sup>[10]</sup> (unrighteousness).

*Dharma* is duties and all daily activities in a righteous manner, deviation from this is *Adharma*. Contagious diseases are explained in the context of *Oupasargika Roga, Janapadodhwamsa*. Microscopic pathogens (not perceptible with sense organs) or microbes are mentioned with different names *Rajaneecara, Raakshasa, Bhoota*, etc. can also cause pandemics.

*Doshas* are functionally classified into *Panch-Mahabhootas*. Ayurveda explains *Doshas* as the intrinsic causative factor for diseases. *Acharya Vagbhata* mentioned that disease happens when *Doshas* are in a state of imbalance and when *Doshas* are in harmony that is in balanced state it creates health in the body.<sup>[11]</sup> *Aahaara* (Diet) consumed according to one's state and stage after digestion will be converted to *Saara* (nourishing part) and *Kitta* (metabolic waste). Unwholesome or disproportionate diet or activities or seasonal changes causes increase or accumulation of respective *Doshas* in the body along with the formation of *Saara* and *Kitta*. By excessive use of *Dravyas* having one or more *Gunas*, *Doshas* with respective *Doshas Gunas* get aggravated in gastro-intestinal tract. These excessively formed *Doshas* instead of nourishing the body gradually gets aggravated initially in *Koshtha (Chaya- Prakopa)*. Eventually further accumulation of *Doshas* results in spread (*Prasara*) of the same all over the body in *Rasavaha Srotas*. As this *Doshas* instead of nourishing the *Dhatu*s interacts with them, it is designated as *Aagantu* (not naturally present) *Dosha*.<sup>[12]</sup>

Nutrition is supplied to all tissues in the body by *Rasa-Dhatu*. Tissues absorb nutrition with the help of *Samana-Vayu* and *Dhatwagni* (metabolic activities at tissue level). *Dhatwagni* is a portion of *Jatharaagni* (digestive fire) itself. *Dhatwagni* is kindled or enfeebled according to the metabolic needs of the tissue. When food consumed is not in accordance with one's metabolic needs, *Dhatwagni* will not be taking up the nutrition from *Rasa-Dhatu*. This causes *Snigdha-Sheeta-Guru Guna* increase in *Rasa*. If excess *Snigdha-Sheeta-Guru Gunas* are consumed and *Rasa-Dhatu* is formed out of that, *Dhatwagni* will not be able to metabolize or utilize the same. So more than *Agni* hypo functioning, *Samana* dysfunction causes

interference in transformation (*Pachana*). The untransformed (*Apaachitam*) *Rasa-Dhatu* will be brought back to *Aamashaya*, where *Kapha Agni* is present by an evoked *Dosha* or *Dosha*, which is already present in circulation (seasonal variation of *Dosha*). If *Kahpa-Agni* in *Aamashaya* fails to digest, the *Dosha* and untransformed *Rasa* combine to become one, which is termed as *Saama Dosha*.<sup>[13]</sup>

### Covid-19 & Ayurveda

The main symptoms of Covid-19 are fever (*Jwara*), cough (*Kasa*), Shortness of breath (*Shwaas*). Fever is the most prominent manifestation when inflammation is associated with infection. It could be identified with *Saama Dosha* symptoms. Any injurious agent (toxin, microbes, immune complexes etc.) in circulation may hinder transformation of *Rasa* and can lead to the development of *Saama Dosha*. *Saama Dosha* reaches respective site where there is *Kha-Vaigunya* through *Rasavaha Srotas*. If *Kha-Vaigunya* is in *Aamashaya*, increase of *Sneha-Guna* in *Rasa Dhatu* (along with *Avalambak Kapha*), generalized obstruction in channels and increase of *Dhatwagni* and *Dosha-Agni* takes place resulting in *Saama Doshaj Jwara*. So, *Sthani Dosha* involved in all *Saama Doshaja* diseases are *Vyana-Samana, Pachak Pitta* and *Avlambak Kapha* along with other *Sthaani Doshas* of respective diseases.

A cough (sudden strong contraction of expiratory muscles causes' explosive expulsion of air) is a sudden and often repetitively occurring, protective reflex, which helps to clear the large breathing passages from fluids, irritants, foreign particles and microbes. *Prana-Udana* produces *Shwaas Kaas Vegas* as part of maintenance of health. Disease develops when sequential permanent dysfunction of *Sthaani Dosha - Dhatu-Mala-Srotas* takes place. *Kaas* develops when *Apana* is obstructed by *Aagantu Dosha*. *Apana* in turn affects *Hridaya (Rasa Sthana)* and then *Udana-Prana Vayus* producing cardinal feature of *Kaas* (sound similar to broken brass metal).

The cardinal feature of *Shwaas* is breathing difficulty. All kind of *Shwaas* have *Kaphaavritta-Prana*. The most common cause of *Shwaas* is cough. Respiratory



system consist of tubes for the passage of air and air exchange area in lungs (parenchyma- respiratory bronchioles and alveoli). Inflammation of alveoli shows features of *Saama-Kapha-Vata*. Origin of *Shwaas Roga* is from *Aamashaya* which is *Pitta Sthana*. Hence, *Samana*, which is controller of *Udaka-Annavaha Srotas* has a role in the initiation of the pathogenesis of *Shwaas*. *Shwaas* starts with *Samana Dushti*. *Aagantu Dosha* causes dysfunction of *Samana* and then causes vitiation of *Mala Roopa Kapha (Rasa Mala)* in respiratory passage and obstruction to *Prana* in *Pranavaha Srotas* (respiratory passage) *Viguna Prana- Samana Vayus* causes *Poorva Roopa* of *Shwaas*.<sup>[14]</sup> *Prana-Udaka-Annavaha Srotodushti* causes the signs and symptoms of *Shwaas Roga*.

Viral infections symptoms can be correlated with (*Aamashayagata- Saama-Vata*<sup>[15]</sup>)

*Acharya Chakrapani* stated ten complication of fever (*Jwara*) which includes *Kaas, Shwaas, Atisaar, Murcha, Chhardi, Aruchi, Trishna, Angamarda, Hikka, and Vidagraha*.<sup>[16]</sup>

#### **Nidana Panchaka**

- *Dosha* - Predominantly *Vata-Kapha (Saama)*.
- *Doosha* - *Rasa Dhatu*.
- *Udbhav Sthana* - *Aamashay*.
- *Srotas* - *Rasavaha Srotas, Pranavaha Srotas*.
- *Hetu* - *Oupsargik Nija*.
- *Purvaroopa* - *Saama Dosha Lakshana - Srotorodha* (obstruction in channels), *Balabhransha* (loss of strength), *Gauravta* (dysfunction in tissue metabolism), *Anil Moodhta* (sluggishness in transformation process).
- *Roopa* - Predominantly *Jwara, Kaas, Shwaas*.

#### **Immunity & Ayurveda**

Immunity is defined as the capacity of the body to resist the pathogenic agent. It is the ability of the body to resist the entry of different types of foreign bodies like bacteria, virus, toxic substances etc. it is of two types- innate immunity, acquired immunity.

Innate immunity is the inborn capacity of the body to resist the pathogens. It is otherwise called natural or nonspecific immunity.

Acquired immunity is the resistance developed in the body against any specific foreign body like bacteria, viruses, toxins. It is also known as specific immunity. Two types of acquired immunity develop in the body- cellular immunity, humoral immunity.

The cell mediated immunity is developed by cell mediated response. This type of immunity does not involve antibodies but it involves several types of cells such as macrophages, T lymphocytes and natural killer cells and hence the name cell mediated immunity. It is also called cellular immunity or T cell immunity.

Cell mediated immunity is offered by T lymphocytes and it starts developing when T cells comes in contact with the antigens. Usually the invading microbial or non-microbial organisms carry the antigenic materials. These antigenic materials are released from invading organisms and presented to the helper T cells by antigen presenting cells.

Humoral immunity is the immunity mediated by antibodies which are secreted by B lymphocytes, B lymphocytes secrete the antibodies in to the blood and lymph. The blood and lymph are the body fluids (humours or humors in latin). Since the B lymphocytes provide immunity through humors this type of immunity is called humoral immunity or B cell immunity.

In Ayurveda term immunity can be called *Vyadhi Kshamatva*. *Vyadhi Kshamatva Bala* is governed by *Ojus*. *Ojus* is the concentrate of the nourishment formed out of good metabolic power (*Tejus-Pitta*) and clear channels (*Vata*). *Ojus* is pure and clear component that forms the core of a structure. It is repository of *Prana*. Its functional aspect is termed as *Vyadhi Kshamatva Bala*, which is combined action of *Udana (Udana Balamuchyate)* and *Agni (Agnir Moolam Balampumsam)*.

*Ojus* developing at the time of birth is *Para-Ojus* situated in *Hridaya* of the body and later is *Apara-Ojus* situated in nucleus of all other structures. *Para-Apara-*

*Ojus* determine innate and acquired resistance (*Vyadhi-Utpaadaka Pratibandhakatva*). Digestion and metabolism upto conversion to *Dhatus* take place by the action of *Pachaka-Pitta*. Production of *Apara-Ojus* (metabolism inside the *Dhatus*) is by *Saadhaka Pitta*. *Ojus*, *Shukra*, *Samhanana* and *Tridosha* equilibrium pave for *Pravara Bala*. Immune activity is performed by *Updhatu Ojus* which is formed from *Shukta Dhatu*, present in all cells and functions in association with three *Dhatus* viz. *Rakta*, *Maamsa*, *Asthi* and accounts for *Vyadhibala- Virodhitva (Samahanana)*. *Updhatu Ojus* formed from *Shukra Dhatu* (stem cells) and are unable to divide or transform. *Ojus* in *Shukra* of the parents accounts for *Para-Ojus* at the time of birth.

*Para-Apara Ojus* determine the resistance (*Vyadhi-Utpaadaka Pratibandhakatva*) in tissues and *Upadhatu-Ojus* has role when pathogens succeed in invading the body and produce a *Vyadhi*.

Considering the facts regarding the immune response to viruses in the body, Ayurveda is the best option to improve the immunity through herbal medicines like *Guduchi (Tinospora cordifolia)*, *Amalaki (Emblica officinalis)*, *Haridra (Curcuma longa)*, *Pippali (Piper longum)*, *Ashwagandha (Withania somnifera)*, *Tulasi (Ocimum sanctum)*, *Chyavanprash*, drinking *Shadagodak* (decoction of *Musta*, *Parpatak*, *Ushir*, *Chandana*, *Udeechya*, *Shunthi*) along with following the guidelines released by Ministry of AYUSH, Government of India for enhancing the immunity.

#### Future Options in Ayurveda for COVID-19

Ayurveda focuses on preventive as well as curative measures of disease.

In context of COVID 19 pandemic, preventive measures can be divided in to two groups one is for general population and second is for peoples working in health care sector.

Preventive measures includes avoidance of potent causative factors (*Nidana Parivarjanam*) like touching contaminated surfaces, living in close proximity with infected person and sharing clothes, foods, utensils etc., for above causes it is advised to stay home and maintaining social and physical distancing, washing

hands frequently, avoid frequent touching of eyes, nose, face. Use of face mask to avoid direct exposure to any pathogens if going out. Follow *Dincharya* (daily regimen) & *Ritucharya* (seasonal regimen) mentioned in Ayurveda. *Dhoopan* (fumigation) with *Rakshoghna* (anti-microbial) *Dravya* to keep surrounding disinfected. This simple tips keep people healthy in pandemic and stop further spread of virus.

For people working in health care sector like doctors, nurses, ward staff apart from above described measures they should compulsory wear PPE (personal protective equipment) which includes face mask, transparent goggle, head cap, gloves and body suit to prevent themselves from corona virus.

*Ayurveda* describes *Aaahar* (nutritious diet), *Nidra* (good sleep), and *Brahmacharya* (celebracy) as a tripod of life. Judicious use of this three leads to health, like in a state of disease one should take easy to digest (*laghu*), slightly hot (*Ushna*), *Saama Dosha* pacifying (*Pachana*) food with only use of medicated water (*Siddha Jala*) with *Dosha Pachana Dravyas* mainly *Tikta* and *Katu Rasa Pradhan* for *Saama Dosha Pachana* and *Agni Deepana* with light cardio exercises (*Vyayam*) as *Vyayam* is mentioned as type of *Langhana* and said to be *Sthairyakaranam* (steadiness) in the body as well as mind. In healthy and after diseased state Ayurveda focuses for *Rasayana* treatment for boosting immunity and avoidance of repetitions of disease and it can be achieved through *Ghritpaan* (intake of medicated *Ghrit*) and various *Rasayana Yoga* according to one's state as it produces the best quality of *Rasa Dhatu* and promotes its circulation up to the tissue level for fighting against the disease as well maintain health and longevity.

Apart from all these one should follow code of conduct in all sates whether a persons is diseased or healthy. It describes ethical, social, mental, moral and physical code of conduct to stay healthy and avoidance of communicable disease and having benefits of *Rasayana Sevan* in Ayurveda.

In curative aspect Ayurveda *Vaidyas* needs patient of Covid-19 to trail age old medical science which is

based on *Tridosha Siddhant* to test protocols as there will not be any manifestation of disease without *Doshas* as *Doshas* are inseparable cause of disease.

## CONCLUSION

Viruses are constantly changing, they can change in two different ways antigenic drift and antigenic shift. Everyday microbes are coming with different mutation and new strains and creating new deadly diseases like Covid-19. Modern medical science is more concerned with the external damaging agents including bacteria, viruses and treating them with vaccinations and antibiotics which have their own potential side effects. Ayurveda *Shastra* is based on *Tridosha Siddhant* which are functionally classified *Panch-Mahabhootas*. A cause of disease can be considered as a cause only when it produces *Dosha Prakopa* in the body and *Dosha Prakopa* can only initiate disease and produces the *Dosha* specific signs and symptoms of the disease. Covid-19 symptoms can be closely related with *Vata-Kapha* predominant symptoms with *Saamavastha* associated with *Jwara, Kaas, Shwaas*. SARS-CoV-2 virus enters in the nose and initially produce symptoms like nasal congestion, rhinitis sore throat for this symptoms patient approaches to ENT outpatient department of hospital for consultation. In Ayurveda it comes under *Shalaky Tantra*, so from beginning itself application of special *Shalaky* treatment modalities like *Pratimarsha Nasya* (nasal drops), *Gandusha* (oil pulling), *Jalaneti* (nasal douching), *Kaval* (medicated gargling) and appropriate *Panchkarma* by assessment and *Doshik* state can prevent the disease spread further by lowering down virulence and from deadly complications like pneumonia, SARS (severe acute respiratory syndrome).

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**How to cite this article:** Dr. Rochan Sharma, Dr. Pravin M. Bhat. Understanding Covid-19 in the light of Ayurveda. J Ayurveda Integr Med Sci 2020;5:259-265.

**Source of Support:** Nil, **Conflict of Interest:** None declared.

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