

**UNDERSTANDING OF COVID-19 WITH AYURVEDA
ROGNIDANATMAK ASPECT -A REVIEW STUDY**

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ABSTRACT

Ayurveda has its own specific diagnostic criteria which gives clear guideline for diagnosis and treatment of covid-19. This is a literary study that focuses on tracing the pathogenetic factors involved in covid-19 disease and pandemic. Ayurveda classical texts, modern textbooks and electronic databases were searched for collection for relevant data. The data was analyzed, evaluated and justified. It was observed that the guidelines from ayurveda texts help to reach to the pathogenetic factors of Anukta vyadhi like Covid 19 too, like Nidana, Purvarupa, Rupa, Samprapti, Upadrava and Upashayanupashaya which play a key role in understanding pathophysiology of this disease. The principle *shaarir bhava's* involved include *pranavaha srotas, kantha,*

phupphusa, pran and *udan vayu, rakta dhatu, mansa dhatu, mahasrotas*. The Covid 19 disease can be correlated to *Vatakapholbana Sannipataja Jwara*. It is concluded that Ayurveda diagnostic guidelines prove to be much effective in the diagnosis and management of covid-19 disease and pandemic.

KEYWORDS:- *Ayurveda* Perspective-Covid 19, causative factors of covid 19 (*Nidan bhava's*), *Janapadodhwansa*-pandemic, *Nidan Panchak*, *Jwara*, Infectious disease.

INTRODUCTION

Ayurveda entails a scientific tradition of harmonious living and its origin can be traced from ancient knowledge in “*Rigved and Atharvaveda*”.^[1] We Indians have inherited a vast legacy of medical knowledge in *Ayurveda*, our traditional medicinal system. *Ayurveda* has its own basic principles, which are the pillars of whole system and are most useful at every step in diagnosis and treatment.

The world has faced a sudden pandemic situation in last two years. The novel Corona virus (SARS Cov 2) created a huge havoc in society as well as medical community. Though we are trying to manage this world spread disease, many of the aspects of this virus still remain a mystery. Though there is no direct mention of Covid 19 in classical Ayurvedic texts, the principles of diagnosis of *Anukta vyadhi* prove to be useful in reaching the diagnosis and pathophysiology of the novel disease.

To decide the line of treatment and management principles, the physician has to understand the factors involved in pathophysiology of the disease. Acharya Charaka gives clear guideline that before heading towards *chikitsa*, the physician should do *Roga pariksha*.^[2] Acharya Madhavakara has suggested the tools for *roga pariksha*, i.e. *Nidana panchaka*.^[3] The present study focuses on understanding the various factors contributing in pathophysiology of Covid-19 with the help of references quoted from classical texts as well as different research articles.

MATERIALS AND METHODS

The data was collected from the following sources

1. Classical texts with their commentaries .- *Ashtanghrudayam*, *Charak samhita*, *Sushruta Samhita*, *Madhav Nidan*.
2. Essay about ‘Covid 19 And *Ayurveda*’ by Vd.Vinod V. Gir. In Late *Vaidyaraj Datarshastri Panchabhautik* Foundation organized competition.
3. Modern literature from modern textbook - *Essentials of Medical Microbiology (MCL)*- Apurba S. Shastry, Sandhya Bhat. (3RD Edition)
4. Wikipedia, YouTube lectures, webinars, magazine, review articles, periodical journals, online research portal.

5. Electronic data base including Google Scholar, PubMed, different government health agencies websites, Google search were search to collect the relevant data by using the key words- covid 19 disease, corona virus, *Ayurveda*, diagnostic view, pathophysiology, *Ayurveda Nidanatmak Vichar* etc.

The collected data was studied, analyzed, evaluated and presented in tabular form.

Review of literature

If we consider the nature of Covid 19 as a viral pandemic disease having wave pattern manifested as respiratory infection, the following factors can be considered to reach to its *Nidana panchaka* -

A. Nidana (Causative factors)

1. Understanding of virus in ayurveda -

There is no direct mention about virus in the classical texts. But it is understood as

- a) *Bhoota*- minute creatures in around us which are the part of universe.^[5,8]
- b) *Krimi* – There are two types of *krimi* mentioned in *Ayurveda* – *sahaja* and *vaikarika*.^[19]
The *vaikarika krimi* are the minute organisms that cause disease manifestation.^[5,10,14]
- c) *Ashwi layer* - As the reference from *Charaka Samhita* of '*Rajayakshma Vyadhi*' explains about the how such disease like covid 19 grounded and spread all over suddenly on the earth.^[20] '*Ashwi*' is one of the layer from seven layers in space on earth. The detailed explanation about the '*Ashwi*' layer is in the '*Kena Upanishada*'. '*Ashwa*' is the 6th layer from below in 7 layers in the space. From which such communicable, bacterial/viral diseases comes/grounded on earth and spreads all over and creates pandemic.

One of the evidence based space scientific research by Sunita Williamson; highlighted that the thin layer below the ozone which forms with whole bacteria, viruses etc. and after with some specific time period/episodes they comes/ grounded in/descend down on the surface of earth and creates a condition like pandemic. Covid 19 is also the one of them

2. *Aagantuja vyadhi* - *Ayurveda* explains '*aagantuja vyadhi*' which are caused by etiological factors from outside getting entry into the human body and causing diseases.^[21] They later cause vitiation of bodily factors (*dosha and dushya*) and convert in *nija vyadhi*.^[17]
3. *Janapadodhwansa* - *Ayurveda* deals epidemic's under the classification of '*Janapadodhwansa*'^[9] i.e. *Janapada* + *Udhwansa* - Large Population + Destruction

The common cause for the *Janapadodhwans*^[7,8,10,13,16,17,18] (destruction of large population) is the vitiation of the 'Vata'(air), 'Jala'(water), 'Desha'(climate), 'Kaal'(time) in a specific time period and that leads to vitiation of *Dosha's* in human body according to the '*Loka-Purusha Samya Siddhanta*'^[23]

4. *Sankramaka / Aupasargika roga* - The reference about the communicable disease in the classical text is under the '*Sankramak Roga*'. The *Acharya Sushruta* gives the reference about the *sankramak roga* or '*Aupasargik*' *roga*. The commentator of *sushruta* defines contagious disease which spreads through physical contact and following reasons.^[24,8,10,18]

1.	<i>Prasangat</i>	Sexual contact
2.	<i>Gatra sansparsha</i>	Skin to skin contact
3.	<i>Nishwasat</i>	Droplet spread through breath
4.	<i>Sahabhojanat</i>	Sharing food with infected person
5.	<i>Saha shayyasan</i>	Sharing bedding and sittings
6.	<i>Vastramalyanulepan</i>	Sharing clothing and jewelry of infected person

5. *Vyadhikshamatwa* – Though it is a communicable, pandemic disease, it is observed that not every person in the population gets infected. The *vyadhikshamatwa* plays a key role in making the body resistant to the disease.^[25] Though it is commonly compared with Immunity, it is a complex mechanism related with *Bala, Prana, Oja* and *Rakta*.^[17]
6. *Desha* - Ayurveda considers *desh vichar* with respect to *deha desh* and *bhumi desh*. It is found that marsh place or wet muddy area which is dominated with *kapha dosha* which leads to *kapha* vitiation and *kapha pradhan vyadhi avastha* (disease condition).^[26]

In context of *deha desha*, the person with *prakruti* of *kapha, vata* or *kapha-vataj* is more prone to get affected with the covid 19 virus.

In *aanupa desha* and *kapha-vataja prakruti*, the *vyadhi* is more stronger.

7. *Kaala - vasant ritu* is one of the factor in the manifestation of covid 19 disease. It was observed that the number of cases infected with the virus started rising in the months of March and April, which constitute the *vasanta ritu*.

Charakacharya quotes in the end of *nidansthan* that there are multiple causative factors for multiple effects and single causative factors can lead to multiple effects and whereas single effect can be generated from multiple factors.^[27]

B. Purvarupa and Rupa

In the initial stage of disease, the action of novel corona virus is seen limited to mucous membrane of respiratory tract. Hence cough, sore throat such mild symptoms has been seen in mild stage. As the virus fixes its roots deep into the body, it attacks on red blood cells (RBCs) in the blood. Its glycoproteins form a bond with heme portion of hemoglobin. During this process, iron ions are released free in the blood. Without iron; hemoglobin has no capacity to carry oxygen. Thus oxygen saturation in the blood rapidly decreases. This hypoxia for a longer time period results in multi organ failure.^[28]

'Jwara' is the *pradhan lakshan* (main symptom) in the covid 19 disease. *Ashtang sangraha* gives reference about the *ushma vrudhhi* (increasing the temperature) due to the entry of dormant harmful living particles in human body.i.e. '*sukshma jantu*'(minute worm particles)^[29]

Clinical spectrum of Covid-19 disease^[30]

	Severity of disease	Presentation
A.	Asymptomatic	<ul style="list-style-type: none"> No clinical symptoms. Positive nasal swab test. (RAT/RTPCR) Normal chest X-ray.
B.	Mild Illness	<ul style="list-style-type: none"> Fever, sore throat, dry cough, malaise and body ache. Nausea, vomiting, abdominal pain, loose stools.
C.	Moderate Illness	<ul style="list-style-type: none"> Symptoms of pneumonia (persistent fever and cough) without hypoxemia. Significant lesions on high resolution (CT Chest)
D.	Severe Illness	<ul style="list-style-type: none"> Pneumonia with hypoxemia.(SPO2 <92%)
E.	Critical Illness	<ul style="list-style-type: none"> Acute Respiratory Distress Syndrome (ARDS) along with shock, coagulation defects, encephalopathy, heart failure, acute injury and multiple organ failure.

According to *Ayurveda* classical text symptoms can be correlated with the disease "*Sannipatik Jwara*" (*Tridoshaj Jwara*) with respect to covid-19.^[31]

	Severity of disease	Presentation
A.	Stage -1	<ul style="list-style-type: none"> <i>Jwara</i> – Fever <i>Kaas</i> - Cough <i>Angamarda</i> - Myalgia

B.	Stage -2	<ul style="list-style-type: none"> • <i>Shwaas</i> – Shortness of breath, pneumonia. • <i>Rakta-pitta-kapha nishthivan</i> – Production of sputum (Reddish yellow), productive cough.
C.	Stage -3	<ul style="list-style-type: none"> • <i>Tivra Jwara</i> } Respiratory failure, septic <i>Dhatupak lakshana</i> } shock, multi organ failure. Etc.

Various efforts taken by Ayurveda experts to correlate this novel disease with different diseases mentioned in classical texts are evidenced in numerous articles as follows –

- Vata kaphaja jwara – It was found in 4 articles.^[8,11,14,17]
- Sannipataja jwara – It was found in 7 articles.^[5,10,11,12,13,15,17] Most of the vaidyas have considered it under *Vatakapholbana sannipata*, where as some have compared it with *Kanthakubja sannipata*^[17] and *Vatolbana sannipata*^[18]
- Bhutabhishangaja jwara – It was found in 3 articles.^[5,8,9,17]
- Vishamajwara – It was found in 2 articles.^[5,11]
- Jwara poorvarupa – It was found in one article.^[11]
- Ojonirodhaja jwara – It was found in one article.^[11]
- Rajayakshma/shosha – It was found in 2 articles.^[9,12]
- Dushta pratishyaya – It was found in one article.^[12]
- Visha - It was found in one article.^[14]
- Oja kshaya- It was found in 2 articles.^[11,12]

C. Samprapti ghataka

Factors involved in pathophysiology of the disease are -

- Agni - *Agnimandya* is one of the important factor in *samparpti* (pathogenesis) of the covid-19 disease. It is said that all diseases are originated due to the *agnimandya*.(impaired digestive function).^[32]
- The virus has tendency to settle on ground very fast. This indicates that it has less *Chalatwa gun*. (lower ability to remain moving and spreading in air). It enters through the sites like mouth, nose etc. These are the *indriyas* (sensory organs) which are *kapha* dominant *avayavas* (organs) in the body that directly affects *pranavaha srotas*'s instantly.^[33]
- The virus mainly attacks the organ like *kantha* (throat) and *phupphusa* (lungs). These are the chief organs of *pranavaha srotas*.^[34]
- Pran* and *Udan vayu*, *Avalambak*, *tarpak* and *bodhak kapha* and *Pachak pitta* are mainly involved in the *samprapti*.^[35]

e) *Shwas vyadhi Vichar* – mainly the vitiation of *pran vayu*, *kapha dosha* which further vitiated *pranvaha srotas* and vitiated *vata dosha* takes a *urdhwa gati* (upward direction) which can be lead to increase the respiratory rate (increase *shwas veg*); that we called as *shwas rog*.

Especially the covid 19 pathophysiology in the moderate and severe stage may be correlated to the *samprapti* (pathophysiology) of *Tamaka shwas*.^[36]

f) The *phupphusa* (lungs) is said to be originated from the froth over the *shonita i.e rakta* (blood) during *avayavotpatti*. (formation of organs) during intrauterine life of fetus. i.e “*shonita phen prabhavam*”^[37]

g) Specially the virus spreads through the sputum (*lalarav*) which is the *mala* of *mansa dhatu*.^[38] Hence, *mansa dhatu dushti* (vitiation of *mansa dhatu*) *vichar* (thinking) and symptoms related to these are more important in pathophysiology of covid 19.

h) The *panavaha srotas* has *mahasrotas* as *moolasthan*.(root).^[30] Hence, the symptoms of *agnimandya* and related symptoms i.e, *avipak*, *ajirna*, *chhardi* (vomiting), *aruchi* (testlessness), *atisar* (diarrhea), *malavashtambha* (hard stool) etc. are also seen in covid 19 pathology afterwards.

D. Upadrava

The post covid complications can be considered as Upadrava of this disease. The post covid complications^[40] and their probable correlation with Ayurveda nomenclature is as follows –

Sr. No.	Post covid complication	Probable Ayurveda nomenclature
1	Fatigue	<i>Klama</i>
2	Dyspnea	<i>Shwasa kashtata</i>
3	Decreased exercise tolerance	<i>Vyayama ashatwa</i>
4	Chest pain	<i>Urahshoola</i>
5	Gastrointestinal symptoms	<i>Avipaka</i>
6	Olfactory dysfunction	<i>Gandha adnyana</i>
7	Gustatory dysfunction	<i>Arasadnyata</i>
8	Cardiac arrhythmias	<i>Hrudrava</i>
9	Elevated Blood pressure	<i>Dhamani pratichaya</i>
10	Sleep disorders	<i>Anidra</i>
11	Mental disorders	<i>Vaichitya</i>
12	Neurological disorders	<i>Vatavikara</i>
13	Cerebrovascular disorders	<i>Raktavikara</i>
14	Irreversible hearing loss	<i>Badhirya</i>
15	Ischaemic stroke	<i>Hrudroga</i>

Organ impairment in organs such as heart (highest, i.e.26 %), lungs, kidney, liver, pancreas and spleen was also observed in post covid syndrome in a prospective study conducted in U.K.^[40]

E. Upashaya anupashaya

Anupashaya can be considered similar to *Nidana* (pathogenetic causes) as *Nidana seva* leads to aggravation of disease. Whereas *Upashaya* is considered as *Aushadha*, *Anna* and *Vihara* which act as relieving factors of the disease.

According to National Clinical Management protocol based on Ayurveda and Yoga for management of Covid 19^[41] published by Ministry of AYUSH, Govt. of India, the following measures were issued for prevention and management of Covid 19-

For Prophylactic care – Ashwagandha aqueous extract or powder, Guduchi ghanavati or Guduchi churna and Chyawanprasha.

For Asymptomatic Covid 19 positive – Guduchi ghanavati or Samshamani vati, Guduchi + Pippali aqueous extracts and AYUSH 64.

For Mild Covid 19 positive – Guduchi + Pippali aqueous extracts and AYUSH 64.

For Post Covid Management – Ashwagandha (Aqueous extract or powder), Chyawanaprasha and Rasayan Churna (Powders of Guduchi, Amalaki and Gokshura).

RESULT AND DISCUSSION

The principles of Ayurveda are so concrete that they can guide the pathway to understand any type of Anukta disease. To decide the correct line of treatment, *Roga pariksha* is indeed very important, for which *Hetu skandha* and *Lakshana skandha* has to be analyzed.

In *Hetu skandha* of Covid 19, the following points are to be considered –

- It is a Janapadodhwansaja vikara having dushti (vitiation) of Desha, Kaala and Vayu.
- It is a Aagantuja vikara where the Virus is a nimitta karana (instrumental cause).
- The Doshik imbalance leading to hampered Vyadhikshamatwa as well as Kaala bala provides favorable environment for the virus to create pathogenesis. As explained by Acharya Charaka, like the seed remains dormant in the soil and germinates at favorable season; the doshas remain dormant in the dhatus and get aggravated after achieving favorable time.^[42] This explains the starting of wave (rise in number of cases) during the *Vasanta rutu* (March-April).

In *Lakshana skandha* of Covid 19, the *Purva roopa*, *Roopa*, *Upadrava* and factors involved in pathogenesis have to be considered –

- Covid 19 shows *Tridoshaja dushti* but is *Vata kaphatmaka* in nature. *Pran* and *Udan vayu*, *Avalambak*, *tarpak* and *bodhak kapha* and *Pachak pitta* are mainly involved.
- The main *srotas* involved where the *sthana sanshraya* takes place is *Pranavaha srotas* and other *srotas* involved are *Annavaha*, *Rasavaha* and *Mansavaha*.
- There are various diseases which can be compared to Covid 19, which include *Rajayakshma/shosha* (due to contagious nature), *Dushta pratishyaya* (due to symptoms like *Ghrana nasha* and *Arasadyata*) and *Visha* (due to its fast spreading / aggravating nature).
- The other correlations include various stages and types of *jwara*. The correlation with *Vatakapholbana Sannipataja jwara* is found to be the nearest because
 - a) Covid 19 disease is manifested as *Amashayodbhava vyadhi*, same as *jwara*.
 - b) In *Janapadodhwansa chikitsa*, *Acharya Charaka* explains the treatment of *Jwara*. The clinical picture and pandemic nature of the disease explains its similarity with the *Vatakapholbana Sannipatika jwara*.
 - c) According to *AYUSH* protocol, the principles of treatment of *Jwara* prove to be helpful in management of Covid 19.

CONCLUSION

From the current study, it can be concluded that -

1. Covid -19 can be considered as a *Aagantuja Sankramak Vyadhi*. The widespread nature of this disease signifies that it is a *Janapadodhwansajanya Vyadhi* caused by the *dushti of Desha, kaala* and *Vayu*.
2. The wave forming nature of the disease signifies that the disease gains strength during the *Vasanta rutu*.
3. The *dosha's* involved in the *samprapti* (pathophysiology) are *vata (pran,udan)* and *kapha (avalambak,tarpak,bodhaka)* and *pitta(sadhak)*predominantly.
4. The *dhatu's* involved *rasa,rakta,mansa, dhatu* and *ooja*.
5. The *srotas's* predominantly involved in covid-19 disease include *pranavaha, annavaha, rasavaha, raktavaha* and *mansavaha srotas*.
6. The organs predominantly involved in covid-19 disease include *kantha, phupphusa, hriday*.

7. There are mainly three *awastha* (stages) observed in this disease – *Mrudu*, *Madhyama* and *Teevra*.
8. Covid -19 manifestation can be correlated to the disease *Vatakapholbana Sannipatik Jwara*.
9. The common upadrava of this disease are Klama, Gandha Adnyana, Aradnyata, Badhirya, Hrudrava, Urahshoola, Dhamani Pratichaya and the commonest organ impairment is observed in Hrudaya (Heart).

Hence we can conclude that the guidelines provided by classical texts of *Ayurveda* can be much useful in diagnosis of covid-19 disease and pandemic.

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