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Ayurveda As An Adjuvant Therapy In Mild To Moderate Covid19 Symptoms

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ABSTRACT: -

In the last 20 years, most of the world affected due to several epidemic or pandemic; Out of them originated from a virus have higher mortality and spread frequency. The COVID-19 pandemic, also known as the coronavirus pandemic, is an ongoing global pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. According to the University of Washington's Institute for Health Metrics and Evaluation, "the number of cases that are being detected needs to be multiplied by 20 or more to get the number of infections that are occurring in India." The institute reportedly also projected that India will report over 1 million (10 lakh) deaths by the start of August. The cumulative death toll due to COVID-19 could rise to 6,65,000 by the end of July, with around 3,29,000 additional deaths between April 12 to August 1 2021. An *ayurvedic* approach towards the prevention and management; to avoid severe complications in early stage of infection would be beneficial as adjunct therapy. A better lifestyle, knowledge of food and nutrition, immune boosters, prophylactic medication and adjunct therapy can definitely help to the health system of India. Most of the time *Ayurveda* could not advice because of their metal substances so all the medical professionals can advice plant based compounds as precaution. This review sheds light on the current SARS-CoV-2 pandemic, epidemiology, global status and possible ayurvedic rural treatment strategies with future potential.

Keywords: COVID-19, Traditional Medicine, Ayurveda, Pandemic, SARS-CoV-2, Therapy



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INTRODUCTION

The COVID-19 pandemic in India is part of the worldwide pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first case of COVID-19 in India, which originated from China, was reported on 30 January 2020. India currently has the largest number of confirmed cases in Asia. As of May 2021, India has the second-highest number of confirmed cases in the world (after the United States) with nearly 24 million reported cases of COVID-19 infection and 262,317 deaths as of 13 May 2021. A second wave beginning in March 2021 was much larger than the first, with shortages of vaccines, hospital beds, oxygen cylinders and other medicines in parts of the country. By late April, India led the world in new and active cases. India began its vaccination program on 16 January 2021. Till 13 May, it was reported that around 178 million doses had been administered, and 39.2 million people had received two dosage⁴ Massive population is a major problem to the government for immunization the whole country, till then ayurvedic adjunct therapy can save a large amount of population. Traditional medicine system like *Ayurveda* has no strong scientific evidence of these adjunct therapies but the knowledge of medicine plants with their pharmacological action would be helpful into relief of mild to moderate infection and save the most of the patients with hospitalization.

MATERIAL AND METHODS

- Knowledge from Ayurveda classics as well as modern texts, research works, articles, online publications, Ministry Of AYUSH Protocols and Guidelines etc.

Pathophysiology, Etiopathogenesis And Diagnosis Of COVID19⁵

Coronavirus (CoVs) encompass a large virus family affecting mainly humans and different animal species including cats, cattle's, camels and also bats [8]. Not so often, but animal coronaviruses have also infected human, recently introduced SARS-CoV2 has joined the list of middle east respiratory syndrome coronavirus (MERS-CoV) and severe acute respiratory syndrome coronavirus (SARS-CoV). SARS-CoV2, a beta coronavirus, has probably originated from bats just like MERS-CoV and SARS-CoV [9]. Human coronaviruses in majority causes respiratory and enteric infections and SARS-CoV-2 infection causes flu like symptoms ranging from fever, cough, headache, asthenia etc. Once the virus reaches to respiratory epithelial cells, it enters by binding to angiotensin converting enzyme-2 through its spike proteins and is then endocytosed inside the host cells. Once inside the cells, the virus starts replicating and targets variety of host cells thereby causing severe pathologies. However, SARS-CoV-2 infection affects people of all ages, in some high-risk individuals, such as older people or those having co-morbidities, the virus might cause severe infections such as interstitial pneumonia, acute respiratory distress syndrome

(ARDS), progressing to multi organ failure and ultimately causing respiratory failure leading to death. Cytokine storm is one of the characteristics of COVID-19 infection majorly occurring in persons having dysfunctional immune responses leading to secretion of pro-inflammatory cytokines such IL-16, IL-1 β , TNF- α , IL-2, IL-7, MCP1, G-CSF, IP-10, IL-10, MIP1 α and others.

SARS CoV-2 Transmission and Its Etiopathogenesis

Virus spreads mainly from person to person through respiratory droplets or bits of liquid, mostly through sneezing or coughing. According to National Institutes of Health (NIH), SARS-CoV-2 virus is stable in aerosols and on surfaces for several hours to days depending upon the surface materials and also ambient environmental conditions. Virus has been reported to be detectable up to three hours in aerosols, up to four hours on copper, up to 24 h on cardboard and up to two to three days on plastic and stainless steel. It has also been testified in stool and may contaminate water supply possibly and subsequently results in aerosol and/or feco-oral based route of transmission. Another study reported the presence of SARS-CoV-2 virus in the tears and conjunctival secretions.

Virus can pass through nasal and larynx mucous membranes and enter into the lungs through respiratory tract. First step of any viral infection is the binding of some viral proteins with receptors expressed by host cells followed by fusion with host cell membrane. ACE2 has been speculated to be the ultimate target of spike protein of SARS-CoV-2. Initial target of virus include lung epithelial cells, where virus attach through its spikes to cellular angiotensin converting enzymes 2 (ACE2) receptor, Further study reported that SARS-CoV-2 has nearly 10–20 folds higher affinity for ACE2

than SARS-CoV. ACE2 is also significantly expressed in other tissues like heart, renal, and gastrointestinal tract. SARS-CoV-2 attaches to the receptor of host cell through S1 domains of its spike glycoprotein (S), and this spike protein is proteolytically cleaved by transmembrane serine protease 2 (TMPRSS2) into S1 and S2 subunits and then S2 induces membrane fusion and virus internalization by endocytosis. After the fusion it releases viral genome RNA into cytoplasm via endocytosis and replication and transcription of virus occur in cytoplasm. During viral RNA replication and transcription these nonstructural proteins (nsps) perform vital functions. This viral replication and cell to cell transmission plays important role in the suppression of ACE2 expression. This suppression of ACE2 leads to decrease in Ang (1–7) synthesis and enhanced levels of Ang II which drives the Ang II–AT1R dependent inflammatory pathways in the lungs and causes parenchymal injury. Additionally, coagulopathy has also been observed in COVID-19 infection, as elevated levels of plasminogen has been observed in patients. This plasmin along with other proteases might play an important role in the cleavage of furin site in the S protein of SARS-CoV-2, thus increasing its virulence and infectivity and is also associated with hyperfibrinolysis.

Immune Response with Cytokine Storm in COVID-19

Immune system of an individual is highly responsible to depict asymptomatic or symptomatic clinical manifestations of COVID-19. Geriatric population with poor immune function along with comorbidities is at increased risk with more susceptibility to various viral and bacterial infections due to less efficient, less coordinated and slower immune response. Cytokine storm noted in critical cases of COVID-19 is a response of an uncontrolled

immune mechanism with an uncontrolled release of cytokines. Multiple factors are involved in triggering cytokine storm which includes virus, bacterial components, sepsis, super antigens, toxins, chimeric antigen receptor T cells and others. It is a life-threatening condition leading to detrimental changes including capillaries leakage, edema, tissue toxicity, organ failure and even shock. Increased levels of IL-6 were significantly observed with clinical manifestation in critical COVID-19 cases.

Diagnosis of COVID-19 Infection

Currently, multiple approaches are efficiently being used for the diagnosis of COVID-19 infection. Two broadly classified techniques include, Real time reverse transcriptase polymerase chain reaction (rRT-PCR) based detection and serology-based detection. This technique is quantitative in nature. Sample types for RT-PCR include nasopharyngeal swabs and oropharyngeal swabs. The RT-PCR results generally become positive after 2–8 days of infection and it is able to process large batches of samples.⁶ Three major strategies are being employed for detection of Ags/Abs including lateral flow immunoassay, ELISA, and chemiluminescence. Further apart from above two standardized techniques for detection of COVID-19 infection, other parameters such as high sensitivity CRP levels, lactate dehydrogenase, alanine transaminase, erythrocyte sedimentation rate, HRCT, CORAD also have been observed.⁷

Treatment Strategies for COVID-19 Infection

- Vitamin D (calcitriol or vitamin D3)
- ACE2 for Therapeutics
- Broad spectrum of antibiotics

- Broad range of antiviral drugs like Remdesivir, Favipiravir, combination of Lopinavir and Ritonavir
- Chloroquine
- Combination of Chloroquine with Azithromycin
- Convalescent plasma therapy
- Corticosteroids
- N-acetyl cysteine
- Tyrosine kinase inhibitor and Colchicine etc.

Ayurvedic Prespective

Thousands of years ago in classical text ‘*Charaka Samhita*’ described about various conditions associated to lung disease like *Prtishyaya* (cold and sneezing) *Kasa* (cough), *Shwas* (Bronchial Asthma and allergic asthma), *Kshatakshina* (ARDS) and chronicity of lung disease i.e. *Rajyakshma*. More over in the eleventh chapter of *Caraka Samhita* [*Kshatakshina Chikitsa*] Acharya described this lesson after the disease name *Unmad* and *Apasmar* because an invisible matter (*Bhuta* or microorganisms) is a root cause of such diseases.

When Acharya described about the etiopathogenesis of *Kshatakshina Roga*; he said the cardinal cause in *Kshatakshina* is injury and the unmanifested Signs and symptoms are known as prodrome (ch.chi.11/12) and a recent history of the patient who (beyond his own power) subjects himself to various activities which can cause an acute lung injury.⁸ However, if there is *Kshata* (injury), pain in the chest, hemoptysis and cough are specially manifested, and if there is *kshinata* (diminution of tissue elements or Chronicity of disease), *Saraktamutratvam* (hematuria) and *Parshwaprashtha katigraha*

(stiffness of the sides of the chest, back and lumbar region) are specially manifested.⁹ The newly arisen disease in the patient having a few symptoms and good digestion is curable. The disease of a yearlong is palliable while that having all the symptoms is rejectable.¹⁰ If the patient suffering from *Kshatakshina* (Pulmonary Abscess) is not given appropriate treatment on time, then this may lead to *Rajayakshma* (TB). Therefore, well before the appearance of *Rajayakshma*, Prior to this the disease should be controlled.¹¹ Food and drinks which are nourishing, *Sheeta* in nature means *Stambhaka* properties, *Avidahi* (which do not cause burning sensation), wholesome and light to digest, should be used by the patient suffering from *Kshatakshina* and who is desirous of regaining health. With due regard to the *Agni* (power of digestion), nature of disease,

wholesomeness of diet, and regimens prescribed for *Rajayakshma*, *Kasa* and *Raktapitta*.¹²

AYURVEDIC APPROACH AS AN ADJUNCT THERAPY:

Ayurveda said that it is very essential in any type of lung injury; the disease should be Need for prompt attention. Various types of herbal drugs and herbal compounds are described in classical texts which have same properties including in the management of Covid19 like antiviral, antibacterial, antifungal, vermucidal or anti malarial. These medicines or compounds can be prescribed as adjunct therapies in outdoor patients as well as indoor patients of Covid 19. This adjunct therapy have the drugs which are easy to available and easy to use.

Kala (Time)	Mild Symptoms	Mild To Moderate Symptoms
Early Morning	<ul style="list-style-type: none"> • Alcohol based gargles¹³ • Chewable Dalchini (<i>Cinnamomum zeylanica</i>), Brihad Ela (<i>Black Cardamom</i>), Dhanyaka (<i>Coriandrum sativum</i>) mixed powder¹⁴ • Triphaladi Kwath (Decoction)¹⁵ contents- <i>Triphala</i>, <i>Trayamana</i> (<i>Gentiana kurroo</i>), <i>Munakka</i> (<i>Vitis Vinifera</i>), <i>Kutaki</i> (<i>Picrorhiza kurroa</i> Royal ex. benth) In Equal Quality • Hot Water¹⁶ whole day • Kharjuradi Avaleha¹⁷ contents: <i>Kharjura</i> (<i>Phoenix sylvestris</i>), <i>Munakka</i> (<i>Vitis Vinifera</i>), <i>Pippali</i> (<i>Piper longum</i>), <i>Sharkara</i> mixed powder in equal quantity with Honey or Ghee 	<p>Alcohol based gargles Chewable Dalchini, <i>Badi Ela</i>, <i>Dhaniya</i> mixed powder [Ch.Chi. 8/137] <i>Atrushkadi Kwath²⁰</i> [Contents: <i>Adusa</i> (<i>Adhatoda vasica</i>), <i>Munakka</i> (<i>Vitis Vinifera</i>), <i>Chhoti Haritaki</i> (<i>Terminalia chebula</i>) mixed Kwath with Honey] Or Peya/ Kwath <i>Gokshura</i> (<i>Tribulus terrestris</i>) <i>Kantakari</i> (<i>Solanum indicum</i>)²¹ Hot Water Whole Day AYUSH 64²² 500 mg twice daily with warm water for 15 days or as directed by Ayurveda physician</p>

With Meal Or Before Meal	Talishadi Churna ¹⁸ contents: Talishpatra (<i>Abies webbiana</i>), maricha (<i>Piper nigrum</i>), Shunthi (<i>Zingiber Officinale</i>), Pippali (<i>Piper longum</i>), Vanshalochana (<i>Bamboo silica</i>), Dalchini (<i>Cinnamomum zeylanica</i>), Chhoti Elaichi (<i>Elettaria cardamomum</i>), Sharkara (Sugar) with Honey or water or with Diet Or Mahasudarshan ghan vati 500mg TDS ¹⁹	Saindhavadi Churna ²³ contents: Saindha Namak (Rock Salt), shunthi (Dry ginger), Vrikshamala (<i>Garcinia indica</i>), Dadima (Dry Punica granatum), Tulasi (Holy basil), Maricha (<i>Piper nigrum</i>), Jiraka (<i>Cuminum cyminum</i>), Dhanyaka (<i>Coriandrum sativum</i>), Sharkara (Sugar) [Diabetic patients Should advice without sugar] along With Diet
Night (after meal)	Same As Above	Agastya Haritaki Rasyana ²⁴ with Golden Milk (Milk with turmeric powder) 10 – 12 gm HS

Immunity Enhancers - Single Drugs: ²⁵

1. Consuming 500 to 1000 mg of aqueous extract of Guduchi (*Tinospora cordifolia* (Thunb. Miers))
2. Consumption of fresh Amla fruit (Indian gooseberry – *Embilica officinalis* L/ *Phyllanthus emblica* L) or Amla candy is also advisable.
3. Gargling with warm water added with turmeric powder (*Curcuma longa* L) and a

pinch of salt or Turmeric (*Curcuma longa*).

4. Frequent sipping of water processed with Tulsi (basil leaves – *Ocimum tenuiflorum* L Merr (synonym *Ocimum sanctum* L) is advised.

Immunity Enhancers - Formulations:

- Chyawanprash Avaleha - 10 - 12 Gm / 1 Spoon
- Drakshavaleha - 10 - 12 gm / 1 Spoon

Pharmacological Action or Therapeutic Action of the drugs which has been explained above: ²⁶

DRUG NAME	BOTANICAL NAME	PHARMACOLOGICAL ACTION
<i>Adusa or vasa</i>	<i>Adhatoda vasica</i>	Expectorant (used in bronchial, asthmatic and pulmonary affections), antispasmodic, febrifuge. Key application as broncho dilatory, expectorant. (Indian herbal Pharmacopoeia.) The ayurvedic Pharmacopoeia of India indicates its use in dyspnoea.
<i>Brihad Ela</i>	<i>Black Cardamom</i>	Same as <i>elettaria cardamomum</i>

<i>Chhoti Elaichi</i>	<i>Elettaria cardamomum</i>	Carminative antiemetic, stomachic, orexigenic, anti-gripe, anti-asthmatic, antispasmodic, antiseptic. Used for flatulence, loss of appetite, colic, bronchitis, asthma.
<i>Chhoti Haritaki</i>	<i>Terminalia chebula</i>	Gentle purgative, astringent, used in cough and bronchial Asthma, and for metabolic harmony
<i>Dadima</i>	<i>Punica granatum</i>	Rind of fruit— <u>astringent</u> , Stomachic, digestive. Used for diarrhoea, dysentery, colitis, dyspepsia and uterine disorders. Powdered flower buds—used in bronchitis.
<i>Dalchini</i>	<i>Cinnamomum zeylanica</i>	Bark— <u>carminative</u> , <u>astringent</u> , Antispasmodic, expectorant, Haemostatic, antiseptic. As antibacterial and fungistatic.
<i>Dhanyaka</i>	<i>coriandrum sativum</i>	Stimulant, stomachic, <u>carminative</u> , antispasmodic, diuretic; also hypoglycaemic and anti-inflammatory.
<i>Guduchi</i>	<i>Tinospora cordifolia</i>	Antipyretic, antiperiodic, anti-inflammatory, antirheumatic, spasmolytic, hypoglycaemic, hepatoprotective. Stem Juice —prescribed in high fever
<i>Haridra</i>	<i>Curcuma longa L</i>	Anti-inflammatory, cholagogue, hepatoprotective, Blood-purifier, antioxidant, detoxifier and regenerator of liver tissue, anti-asthmatic, anti-tumour, ant cutaneous, antiprotozoal, stomachic, carminative. Reduces high plasma cholesterol. Antiplatelet activity offers protection to heart and vessels.

		Also protects against dna damage in lymphocytes.
<i>Jiraka</i>	<i>Cuminum cyminum</i>	Carminative, antispasmodic (used in dyspepsia and diarrhoea), stimulant, diuretic, antibacterial, emmenagogue, galactagogue
<i>Kharjura</i>	<i>Phoenix sylvestris</i>	Restorative
<i>Kutaki</i>	<i>Picrorhiza kurroa Royal ex. benth</i>	Anti-amoebiasis, stomachic, anti-diarrheal, cholagogue, hepatoprotective.
<i>maricha</i>	<i>Piper nigrum</i>	Used for diseases of the respiratory tract (cough, Bronchitis, asthma)
<i>Munakka</i>	<i>Vitis Vinifera</i>	Nourishing and invigorating. Used in prescriptions for cough, respiratory tract catarrh, subacute cases of enlarged liver and spleen
<i>Pippali</i>	<i>Piper longum</i>	Stimulant, carminative, diuretic, anti-cholerin, sialagogue, bechic, anti-asthmatic.
<i>Shunthi</i>	<i>zingiber Officinale</i>	Antiemetic, anti-flatulent, hypo-cholesterolaemic, anti-inflammatory, antispasmodic, Expectorant, circulatory stimulant, diaphoretic, increases bioavailability of prescription drugs. Used for irritable bowel and diarrhoea, Colds and influenza.
<i>Talishpatra</i>	<i>Abies webbiana</i>	Expectorant, bronchial sedative, decongestant, anti-catarrhal, antiseptic, carminative.
<i>Trayamana</i>	<i>Gentiana kurroo</i>	Anti-malarial, sialagogue, digestant, appetite-stimulant, antispasmodic, anti-inflammatory, emmenagogue. Used for alkalosis.
<i>Amlaki</i>	<i>Phyllanthus emblica Linn.</i>	Anti-anaemic, anabolic, antiemetic, bechic, astringent,

		Anti-haemorrhagic, anti-diarrhoeal, diuretic, antidiabetic, carminative, antioxidant.
<i>Vibhitaki</i>	<i>Terminalia bellirica Roxb.</i>	Purgative when half ripe, astringent when ripe; antipyretic; used in prescriptions for diarrhoea, dyspepsia, biliousness; cough, bronchitis and upper respiratory tract infections, tropical pulmonary eosinophilia and allergic eruptions.
<i>Tulasi (Holy basil)</i>	<i>Ocimum tenuiflorum L Merr</i> (synonym <i>Ocimum sanctum L</i>)	Leaf—carminative, stomachic, antispasmodic, anti-asthmatic, antirheumatic, expectorant, stimulant, hepatoprotective, antiperiodic, antipyretic and diaphoretic. Seed— Used in genitourinary diseases. Root—antimalarial. Plant—adaptogenic, antistress. Essential oil— Antibacterial, antifungal.
<i>Vanshalochana</i>	<i>Bamboo silica</i>	Bamboo-manna—pectoral, Expectorant, carminative, cooling, aphrodisiac, tonic (used in debilitating Diseases, urinary infections, Chest diseases, cough, asthma). The plant gave cyanogenic glucoside— Taxiphyllin. Bamboo-manna Contains silicious crystalline substances.
<i>Vrikshamala</i>	<i>Garcinia indica</i>	Antiscorbutic, cholagogue, cooling, antibilious, emollient and demulcent.

CONCLUSION

Currently India is struggling with the shortage of the vaccine. At least 60% population of Indian subcontinent resides in the rural areas. These rustic people are well verse with the knowledge of home remedies and the availability of remedial plants is also quite convenient in the countryside. In this way people can use the compound of regular spices and local medicinal plants for the adjunct therapy to minimize the chances of Chronicity the disease. It can help in reducing the excessive burden being faced by the hospitals in the Corona pandemic situations.

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