

A review of Ayurvedic measures for preventing COVID-19 and promoting health during pregnancy

Neelam Kumari Singh, Alok Singh Sengar,¹ Sudhanshu Kumar Jha²

Central Ayurved Research Institute, Ministry of AYUSH, Govt. of India, Jhansi, Uttar Pradesh, India, ¹Department of Samhita-Sidhanta, Bundelkhand Govt. Ayurvedic Medical College, Jhansi, Uttar Pradesh, India, ²Central Ayurveda Research Institute, Jhansi, Uttar Pradesh, India

Abstract

With the fourth year of the pandemic under its belt, the SARS-CoV-2 virus (COVID-19) disease is no longer deemed a public health emergency, but rather a persistent health issue. COVID-19 is one among the many diseases caused by severe acute respiratory syndrome coronavirus-2. Two waves of COVID-19 infections have recently emerged in India, with 2.8 million confirmed cases and 1,95,123 fatalities as of April 26, 2021. Typically, individuals have symptoms such as fever, dry cough, and malaise, which usually subside within a few days. However, in rare instances, these symptoms can escalate to respiratory distress, organ failure, and ultimately death. According to the World Health Organization, pregnant women are at a higher risk of contracting COVID-19 and may experience more severe symptoms than the general population. This is owing to their adaptive physiological changes and weakened immunological condition. Additionally, there is an elevated risk of premature delivery. Susceptible populations require special attention, efforts, and care to protect them from the coronavirus. No specific drug has been discovered for pregnant women (COVID-19) to date. Thus, preventive actions are the primary focus worldwide. Considering the current COVID-19 crisis, strengthening one's immune system is very crucial, and in recent weeks, there has been much interest in Ayush practices that boost immunity. This article describes numerous *Rasayana* medicines, both single and compound, as well as preventive measures. This study primarily aims to understand the *Ayurvedic* perspective of COVID-19 during pregnancy and to offer *Ayurvedic* measures for immune regulation, health promotion, and prevention. By adopting *Ayurvedic* measures, the immunity of pregnant women can be enhanced, and COVID-19 will be prevented well, which will lessen the burden of the disease worldwide.

Keywords: Ayurveda, COVID-19, immunomodulator herbs, *Janapadodhwansa*, pregnancy, *Rasayana* therapy

INTRODUCTION

Wuhan, the capital of Hubei province, was the site of the initial detection of the novel coronavirus. A case of pneumonia was reported in Wuhan, China, on December 31, 2019, although the reason has not been determined. The pandemic was declared a worldwide public health emergency by the World Health Organization (WHO) on January 30, 2020. On February 11, 2020, the WHO termed the novel coronavirus disease, SARS-CoV-2 virus (COVID-19), and declared it a pandemic on March 11, 2020. From a worldwide public health catastrophe to an ongoing health concern, the COVID-19 pandemic has changed dramatically as it reaches its fourth year. There

have been 4170 active cases (0.01% of the total) as of April 26, 2021, in India; 44,472,153 cured or discharged cases (98.81% of the total); and 533,337 fatalities (1.18% of the total).^[1] Ayurveda, the traditional Indian medical system, is vital in the fight against the COVID-19 pandemic. One of the most well-known infectious diseases, the coronavirus mostly affects the respiratory systems in people. The coronavirus is a small, single-stranded ribonucleic acid virus that measures 80–120 nm in diameter. It has a 14-day incubation period depending on the patient's age and immune system health. Fever,

Address for correspondence: Dr. Neelam Kumari Singh, Central Ayurveda Research Institute, CCRAS, Ministry of AYUSH, Govt. of India, Jhansi 284002, Uttar Pradesh, India.
E-mail: drsengar.neelam@gmail.com

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coughing, and fatigue are the most common symptoms of COVID-19. However, other additional symptoms include difficulty in breathing, low lymphocyte count, diarrhea, and coughing up blood. Direct contact or the release of infectious droplets from an infected person's cough or sneeze are the main vectors for the spread of the disease from person to person.^[2] In context to epidemics, *Aupsargik Vyadhi*, (~contagious ailments) and *Janpadodhwansa*,^[3] (~which describe events that cause widespread destruction of human settlements) had been explained in the text of Ayurveda. Contamination of air, water, climate, and environment causes diseases to spread extensively.^[4] The formal classification of COVID-19 as an airborne illness is based on the fact that it is transmitted through the aerosols released when a person sneezes or coughs. According to *Ayurveda*, this illness shares many symptoms with those of *Agantuja Jwar* (~fever caused by external factors such as viruses).^[5] It has a connection to a certain type of *Bhuutabhishangaja Jwar* (~that originates from microbes). [Figure 1] As the illness and a vitiation of the body's *Doshas* progress further, symptoms such as discomfort, burning sensation, lack of appetite, lethargy, cough, and *Nija-Vyadhi* (~endogenous diseases) are manifested.^[6] Dyspnea and a high mortality rate characterize the advanced stage of COVID-19; these symptoms are similar to those of *Sannipataja Jwar* and have the potential to exacerbate uncontrolled circumstances.^[7] Its clinical manifestation resembles those of *Kaphavataj* and *Sannipataja Jwar* and responds well to complementary and alternative medicine treatments. In Ayurveda, *Achara Rasayan*, *Sannipataja Jwara Chikitsa*, *Swasa-Kasa Chikitsa*, *Nasya*, and *Rakshoghna dhoopa* (~herbal fumigation) are some of the accessible therapy modalities.

Physiological Changes During Pregnancy

The state of pregnancy is hypercoagulable. During pregnancy, the fibrinogen level increases by 50%, from 200–400 to 300–600 mg/dL. The immune system undergoes a significant shift, with a greater emphasis on the innate and humoral immune responses rather than the cell-mediated cytotoxic immune response. Progesterone induces a state of hyperventilation that alters the respiratory system, leading to a 40% increase in respiratory minute volume and tidal volume and a 5% decrease in total lung capacity due to a 4 cm elevation of the diaphragm. Because of higher oxygen demand and decreased residual capacity, the pregnant woman has a lower maternal oxygen reserve.^[8] This physiological dyspnea in pregnancy complicates the diagnosis of pulmonary disease.

COVID-19 and Its Impact on Pregnant Women and Fetuses

As a result of the weakened immune system during pregnancy, contracting COVID-19 may have a more detrimental impact and can be linked to more severe symptoms. As COVID-19 itself is a hypercoagulable state, there could be an increased risk of maternal vascular thromboembolism.^[9] COVID-19 can cause premature birth, miscarriage, and fetal distress.

Clinical Features

Patients in the general population exhibited comparable patterns of clinical characteristics to those of pregnant women who tested positive for COVID-19. Fever and cough were the most prevalent symptoms, and other warning indicators included lymphopenia, chest computed tomography (CT) scan abnormalities such as

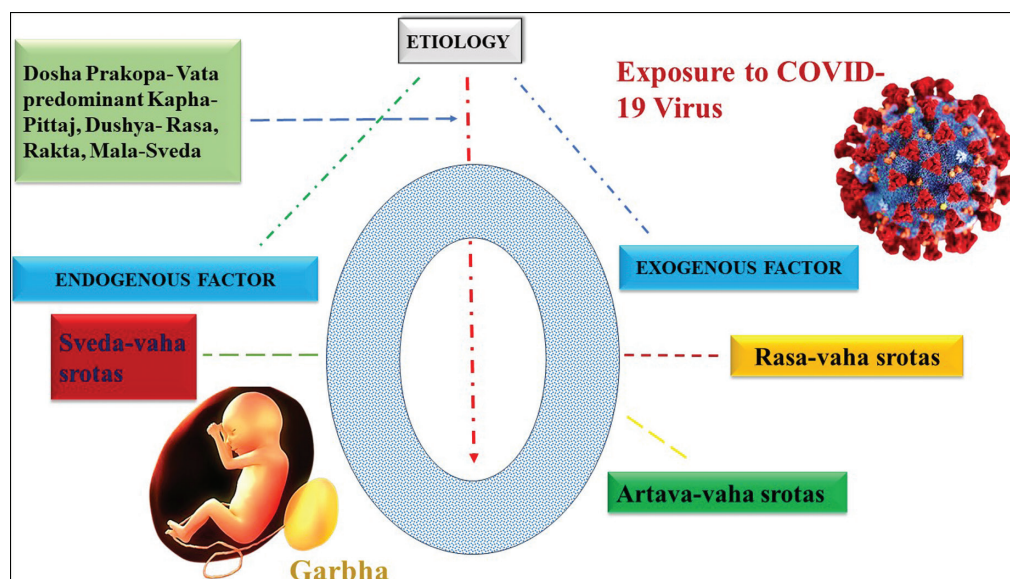


Figure 1 : Etiopathogenesis of COVID-19 during pregnancy

pneumonia, ground glass opacity, an odd paving pattern, and consolidation that was widespread in both lower lobes of the lungs. The main diagnostic methods are reverse transcription polymerase chain reaction testing and a chest CT scan with an abdominal shield.^[10]

Aims and Objectives

This study proposes the use of Ayurvedic single and compound *Rasayana* formulations, as well as other preventive measures, to safeguard pregnant ladies from COVID-19. The objectives are to understand the *Ayurvedic* perspective of COVID-19 in *Garbhini* (~pregnancy) and to understand the immunomodulation action of *Ayurved Rasayana* therapy.

MATERIALS AND METHODS

All pertinent materials, including commentaries on traditional *Ayurvedic* texts, current modern literature, journals, and electronic databases such as Google Scholar, PubMed, and websites of various government health agencies, were referred to and reviewed. The literature relevant to the title was examined, and a conclusion was drawn after scrutinizing the logic and supporting data.

DISCUSSION

Since there is no specific medication for COVID-19, only natural medicine that boosts immunity can protect against the illness. A person with strong immunity has a low risk of infection. Although the individual has tested positive for COVID-19, the disease is likely to progress slowly, and their recovery from the infection is anticipated to be rapid due to their strong immune system. *Ayurveda* discusses the virus, known as *Janapadodhwansa*, as the cause of extensive damage. The book describes a wide variety of plants and compound combinations that demonstrate the *Rasayana* effect. *Rasayana* is a therapeutic approach that strengthens the body's defense system against diseases. The enhancement of *Rasadhatu* and production of the *Sarabhaga* of *Saptadhatu* result in nourishment for the body, soul, and mind. *Rasayana* is renowned for its rejuvenating and immune-modulating properties, both of which are essential for preventing COVID-19. Clinical and experimental investigations have provided scientific proof of *Rasayana's* positive effects.

Preventive Measures

Routine antenatal visits should be deferred. For minor ailments, the patient should consult a doctor telephonically or by videoconferencing. Visits on the 12th and 19th-week scans are essential. The next visit can be at 32 weeks of gestation. Besides this, she should follow the WHO and ICMR guidelines such as staying at home, avoiding touching the face, avoiding non-essential travel, washing hands frequently, social distancing, staying

vigilant, wearing masks, practicing respiratory hygiene, avoiding crowded places, and seeking mental healthcare or psychological counseling.^[11] Ayush recommends practicing yoga poses, pranayama, and meditation for at least half an hour every day as forms of self-care. It is recommended to use spices such as *Lashun* (~garlic), *Jeera* (~cumin), *Dhanyak* (~coriander), and *Haldi* (~turmeric) in cooking. The *Pratimarsh Nasya*, a procedure that entails the application of substances such as ghee, sesame oil, or coconut oil to the nostrils, should be performed twice daily, once in the morning and once in the evening. Eat freshly prepared food so that it can be digested easily. It is important to get enough sleep, at least 8 h.^[12]

Ayurveda Rasayan

Rasayana therapy can be administered to individuals who are in good health; healthcare professionals; those who are suspected or under quarantine; patients who have a history of travel or contact with COVID-19; asymptomatic individuals who tested negative for COVID-19; vulnerable populations such as the elderly, pregnant women, and children; and patients with weakened immune systems.

Immunity Enhancers Medicinal plants

Scientifically, multiple plants have demonstrated antiviral and immune-enhancing properties. Medicinal plants such as *Ashwagandha*, *Guduchi*, *Amalaki*, *Mulethi*, *Shatavari*, *Kirattikta*, *Tulasi*, *Punarnava*, and *Pippali* mentioned in *Ayurveda* can alleviate the symptoms of COVID-19-related illness.^[13] [Table 1]

Compound Formulations of Rasayana

Ayurvedic formulations and medications such as *Triphala churna*, *Agastya haritaki*, *Anu taila*, *Ashwagandha* (~*Withania somnifera*), *Chyawanprasha*, *Guduchi* (~*Tinospora cordifolia*), *Pippali* (~*Piper longum*), and *Shanshamani Vati* have been proven effective in treating COVID-19 patients, as supported by numerous clinical studies.^[14] An Ayurvedic practitioner must thoroughly evaluate the dosage of the formulation, taking into account the *Roga* (~disease) and *Rogibala* (~strength of the patient), with particular attention to vulnerable groups such as the elderly, pregnant women, and children.^[15]

1. *Sanshamani vati*, a tablet prepared with *Giloya* (~*Tinospora cordifolia*) is to be taken twice daily at a dose of 250 mg. It is renowned for its ability to produce platelets, reduce inflammation, and modulate the immune system. In *Jyarahdikara*, the term “*Guduchi Ghanavati*” is synonymous with *Sanshamanivati*.^[16]
2. *Sitopaladi Churna* consists of four parts long pepper, two parts lesser cardamom, one part cinnamon, sixteen parts *Mishri*, and eight parts *Vanshalochana*. The dosage is 3 gm, twice a day. People use *Sitopaladi Churna* to treat a variety of respiratory conditions, such as bronchitis, pneumonia, tuberculosis, chest congestion,

Table 1: Immunity enhancers medicinal plants

S. no.	Plants	Pharmacological activity
1.	<i>Mandukparni</i> (~ <i>Centella asiatica</i>) ^[28]	<i>Medhya Rasayana</i> (~brain tonic), rejuvenating and immunomodulatory <i>Kasahar</i>
2.	<i>Madhuyasti</i> (~ <i>Glycyrrhiza glabra</i>) ^[29]	<i>Medhya Rasayana</i> (~brain tonic), <i>Sothahar</i> (~anti-inflammatory), <i>Jvarghna</i> (~antipyretic), antioxidant, and immunomodulatory
3.	<i>Guduchi</i> (~ <i>Tinospora cordifolia</i>) ^[30]	Activates macrophage cells, <i>Medhya Rasayana</i> (~brain tonic), rejuvenating, immunomodulatory, <i>Kaphaghna</i> , and <i>Jvarghna</i> (~antipyretic)
4.	<i>Amalaki</i> (~ <i>Embllica officinalis</i>) ^[31]	Immunomodulatory, rejuvenating, antioxidant, <i>Kaphaghna</i> , and <i>Sothahar</i> (~anti-inflammatory)
5.	<i>Neem</i> (~ <i>Azadirachta indica</i>) ^[32]	<i>Kaphaghna</i> , <i>Jvarghna</i> (~antipyretic), <i>Sothahar</i> (~anti-inflammatory), and immunomodulatory
6.	<i>Tulasi</i> (~ <i>Ocimum sanctum</i>) ^[33]	<i>Shwasahar</i> , <i>Jvarghna</i> (~antipyretic), <i>Kasahar</i> , immunotherapeutic, and antiviral
7.	<i>Shirisha</i> (~ <i>Albizia lebbek</i>) ^[34]	<i>Shwasahar</i> , <i>Jvarghna</i> (~antipyretic), <i>Kasahar</i> , antioxidant, <i>Vishghana</i> (~antitoxic), antihistaminic, and <i>Sothahar</i> (~anti-inflammatory)
8.	<i>Shunthi</i> (~ <i>Zingiber officinale</i>) ^[35]	Antioxidants, antihistaminic, <i>Sothahar</i> (~anti-inflammatory), and <i>Kasahar</i>
9.	<i>Ashwagandha</i> (~ <i>Withania somnifera</i>) ^[36]	Macrophage activity, <i>Balya</i> (~tonic), <i>Brihaniya</i> , immuno-stimulatory, <i>Shwasahar</i> , antioxidant, <i>Kasahar</i> , and <i>Sothahar</i> (~anti-inflammatory)

colds, and flu. This acts as an expectorant, helping loosen and remove mucus. Their immune-modulating, antioxidant, and anti-inflammatory qualities enable the management of respiratory infections.^[17]

- The recommended dosage of *Chyawanprasha* is 10g, or 1 tablespoon, to be taken in the morning on an empty stomach. It has proven efficacy in treating cough, asthma, and other respiratory diseases. Diabetic individuals should consume Chyawanprash which is devoid of sugar. The dosage should be adjusted to avoid suppressing hunger or appetite for meals. The main constituent is Amlaki (~*Embllica officinalis*), which possesses the greatest concentration of vitamin C. It enhances the deficient *Dhatu*; boosts immunity, stamina, and vitality; and possesses anti-aging properties.^[18]
- To strengthen the immune system, drinking *Ayush Kwath*, a herbal infusion or tea, is beneficial. A special herbal tea made with *Tulasi*, *Shunthi* (~*Zingiber officinale*), *Dalchini* (~*Cinnamomum zeylanicum*), *Kalimarich* (~*Piper nigrum*), and *Munakka*. The preparation time is 5–7 min when using 3g of the material in 200 mL of water, reduce the volume of the liquid to 150 mL, strain the mixture, and drink it once daily. If you want to change the flavor, you can add fresh lemon juice or *Guda* (~jaggery).^[19] During pregnancy, ginger does not pose a significant risk of adverse effects. Research has shown that *Ayush Kwath* has a variety of beneficial effects, such as immunomodulatory, anti-inflammatory, antiplatelet, hepatoprotective, and renoprotective. For these reasons, it may be useful in controlling immunity to prevent and lessen the consequences of viral diseases.^[20]
- Triphala Churna* balances the three doshas in the body and also serves as a colon detoxifier and rejuvenator. *Triphala* supports and enhances longevity, immunity, and well-being. It has been stated that in addition to vitamin C, *Triphala* has a higher content of flavonoids

such as β -sitosterol, bellericanin, ellagic acid, chebulinic acid, and gallic acid.^[21] It possesses antioxidant^[22] and immunomodulatory properties.^[23]

Rasayana, Immunomodulation, and COVID-19

Immune system regulation occurs naturally and is also a result of human activity. As a component of immunotherapy, immunomodulation involves inducing, amplifying, attenuating, or preventing immune responses based on therapeutic objectives. *Rasayana* therapy is recommended for this widespread ailment.^[24] Immunity is known as the capacity to stop the spread of illness, and it aids in preserving homeostasis. *Rasayan Drava* is used to acquire immunity.^[25] A weak immune system is the consequence of poor eating habits, lifestyle choices, stress, and ongoing exposure to various environmental contaminants. The properties of nourished *dhatu* and *Oja* help in determining the *Vyadhikshamatva* (~immunity). The *Ayurvedic* text describes that an imbalance of *Dosha* and *Dushya*, resulting from *Ksheena Vyadhikshamatva* (~low immunity), causes the illness. Immune modulation is therefore crucial in medicine to fight a variety of inflammatory, viral, chronic, autoimmune, and lifestyle disorders. Immunomodulators enhance the activity of immunological effector cells, including dendritic cells, macrophages, lymphocytes, cytotoxic T lymphocytes, and natural killer cells. Together, these cells shield the body from the antigen.^[26] Immunomodulation forms the foundation of *Rasayana* theory and practice. It enhances the functions of *Agni* and *Oja*.

Probable Mode of Action

Rasayana likely works by helping the *Saptadhatus* (~the seven essential tissues) get the nutrients they need to grow and stay healthy. *Rasayana* includes a variety of medications, food plans, and exercise routines that slow down the aging process and ward against disease. Examples include *Giloy*,

Guggul, and *Haritaki*.^[27] *Rasayana* treatment strengthens and revitalizes the body's physiology, building mental and physical resilience to illness. *Rasayana* treatment helps build a stronger immune system and prevent opportunistic illnesses. Some of the effects of *Rasayana* that have been explained by modern science include its nutritional function, immunomodulatory effects, antioxidant activity, antiaging effects, neuroprotective, and hemopoietic effects. The three levels at which *Rasayana* therapy operates are *Agni* (~which promotes digestion and metabolism), *Srotas* (~which promotes microcirculation), and *Rasadhatu* (~which functions as a direct nutrient).

CONCLUSION

Currently, there is no targeted pharmaceutical treatment for COVID-19 during pregnancy. By implementing *Ayurvedic* practices and utilizing *Rasayana* formulations, the immune system of pregnant women can be bolstered, effectively preventing the occurrence of COVID-19.

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Conflicts of interest

There are no conflicts of interest.

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