



**Review Article**

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## Ayurveda Rasayan in prevention and health promotion of COVID-19

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### ABSTRACT

**Background:** Corona virus infection caused by a novel corona virus is an ongoing pandemic affecting whole country. The disease has spread globally affecting 213 countries with 7.06 million corona virus cases and 1, 09,856 deaths as of 13th October 2020. In most cases the symptoms are fever, dry cough, fatigue which resolves in few days, but in few cases, it progressed gradually into respiratory distress, multiple organ failure and death. Nowadays numerous efforts on researches are being ongoing to develop vaccines and effective medicines for the disease, but till date no specific treatment or vaccine is available. Whole world is focusing on preventive measures. The old adage “prevention is better than cure” has become all the more relevant. Enhancing the body’s natural defense system is particularly important in the covid19 situation and there has been tremendous interest in last few weeks in AYUSH practices that increases immunity. Many single drugs and compound formulation have been mentioned in Ayurvedic text as rasayan. It will be good for us if we adopt Ayurveda rasayan as a preventive measure, which helps to boost our immunity in present times. **Objectives:** The main aim of this study is to review ancient’s classical and recent modern literature and journal for understanding the Ayurvedic perspective of disease and to provide prevention, health promotion, and immunomodulation by Ayurveda rasayan in covid-19. **Methods:** Classical Ayurveda, recent modern literature, relevant journals reviewed. Literature related to the title has been explored, rationality and evidences are studied and conclusion has been drawn. **Conclusion:** Ayurveda Rasayan may help in boosting of our immunity and thereby promoting the health of individual or public, which is the ultimate requirement in prevention of COVID-19. The beneficial actions of Rasayan have been proven scientifically through clinical and experimental studies, which potentially will help in reducing the disease burden.

**Keywords:** Ayurveda, COVID-19, Immunomodulator herbs, Janapadodwamsa, Rasayana, Vyadhikshmatava.

### INTRODUCTION

Corona virus is a new virus first identified in Wuhan, Hubei province, China. A pneumonia of unknown cause detected in Wuhan, China on 31<sup>st</sup> December 2019. On 30<sup>th</sup> January 2020 this outbreak was declared a public health emergency of international concern. WHO announced a name covid-19 for it on 11<sup>th</sup> February 2020 and by WHO it has been declared as a pandemic on 11<sup>th</sup> March 2020<sup>1</sup>.

The current covid-19 outbreak is rising continuously day by day. In INDIA the total number of confirmed cases has reached 7,066,024 with 838,729 active cases(11.69%),62,27,295(86.78%) cured/discharged cases and 109856(1.53%) deaths as of 13<sup>th</sup> October 2020. In present pandemic time to keep the individuals healthy becomes a challenge for us, as till date no specific drug or vaccine has been found suitable for (COVID-19). In this situation prevention of COVID-19 is the only option which can be achieved through Ayurved bringing new ray of hope for the prevention and control of COVID-19<sup>2</sup>.

Corona virus is one of the major pathogens that primarily target the human respiratory system. The symptoms of COVID-19 infection will appear after an incubation period of 5 days. The period from the onset of COVID-19 symptoms to death ranged from 6 to 41 days with a median of 14 days. This period is directly depending on the age and immune status of the patient. This period was found shorter among the patients who were more than 70 years old, while longer in those under the age of 70. The most common symptoms were seen; at onset of COVID-19 illness are fever, dry cough, and fatigue, while other symptoms are increased sputum production, headache, haemoptysis, dyspnoea, diarrhea and lymphopenia. Person-to-person transmission occurs through direct contact or through droplets spread during coughing or sneezing from an infected individual<sup>3</sup>.

Ayurveda has clearly mentioned the epidemics under the janpadodhwansa vikar (conditions devastate the human settlements on large scale) in the chapter of janpadodhwansa<sup>4</sup> and under the context of aupsargik vyadhi(Contagious diseases) in kusthanidan adhyaya.

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Janapadodhvamsa which is caused by pollution of air, water, climate and environment is responsible for the spread of diseases on a larger scale. In Ayurvedic classics causes and characteristics of vitiation of air, water, climate and place have been described<sup>5</sup>. Improper waste disposal, distribution of polluted water, air pollution and indulgence in unhealthy and unwholesome activities, failure of judgment and misunderstanding of situation leading to reasonable harm to the health of the society, resulting in Janapadodhvamsa<sup>6</sup>. This condition will produce the symptoms like fever, cough, fatigue, dyspnoea. In Ayurveda, its manifestation can be comparable to agantuja jwar (fever caused by external factors may be like virus etc.)<sup>7</sup>, with special reference to one of the types of Bhuutabhishangajam jwar (microbiological etiology). Diagnosis of modern science related to corona virus is microbiological and seat of disease is respiratory tract. Therefore, it's agantukam or grahajanyam. Its clinical picture resembles Sannipataja Jwara and has close relationship with grahottha vyadhi. Hence carries similar drugs and other management. Sannipataja Jwara chikitsa, swasa chikitsa, achara rasayan, nasya and rakshoghna dhoop (herbal fumigation) are line of treatment. The concept of herbal fumigation commonly called as dhupan which will be very effective during the current epidemic.

In progression of the disease, it vitiates the Doshas in body and gets converted into Nija Vyadhi (endogenous diseases), it may resemble to Vata-Kaphaja Sannipataja Jwara with the symptoms like feeling of cold, cough, anorexia, drowsiness, thirst, burning sensation and pain<sup>8</sup>. Uncontrolled conditions further may be complicated by dyspnea and high fatality rate, which occurs in advanced stage of COVID-19 resulting in Sannipataja Jwara<sup>9</sup>.

## MATERIALS AND METHODS

All the relevant Ayurved and modern literatures in context to COVID-19 were referred and explored. Rationality and evidences were reviewed and conclusion has been drawn.

## DISCUSSION

As there is no specific medicine available for the treatment of covid-19, only immunity enhancing natural medicine can provide shield against such infection. If someone has good immunity power, the chances of becoming infected will be low, even if the person with good immunity found positive for covid-19, the intensity of disease progression will be mild; and he will easily recover from the infection because of intact immunity power of body. As the virus is responsible for the massive destruction, which is in Ayurveda mentioned under the context of Janapadodhwansa. Rasayana therapy is recommended for this epidemic condition<sup>10</sup>. There are many herbs and compound formulation in text having the Rasayana effect. In Ayurveda, Immunity comes under the context of Vyadhikshamatwa. Rasayana is a therapy which gives the strength to the body to combat against the diseases. It enriches the rasa Dhatu, makes Sapta Dhatus of optimum quality and hence, body, soul and mind are well nourished through it. The Rasayana are known for their immune modulation effect and rejuvenation properties, which have importance in prevention of Covid-19. The beneficial actions of Rasayana have been proven scientifically through clinical and experimental studies.

### The Perspectives on immune responses and covid-19

Clinically, two phased immune responses induced by SARS-CoV-2 infection. The first phase is immune defence-based protective phase and the second is inflammation-driven damaging phase. During the incubation and non-severe stage, i.e. in first phase, a specific adaptive immune response is required to eliminate the virus and to prevent the disease progression into severe stage. Therefore, strategies to boost immune responses (anti-sera or pegylated IFN $\alpha$ ) at this stage are certainly important. For the development of an endogenous protective immune response at this stage, the host should be in good general health and an appropriate genetic background (e.g. HLA) that will elicit specific antiviral immunity. However, when a protective immune response is impaired, virus will propagate further leading to massive destruction of an affected tissue, especially the organs that have a high ACE2 expression (Most abundant in Alveolar Cells of Lungs). The damaged cell induces innate inflammation in the lungs which is mediated by proinflammatory macrophages and a leukocytosis often seen in second phase of Covid-19. Cytokine release syndrome (CRS) is also affecting the patient. In the severe stage the main cause of life-threatening respiratory disorders is lung inflammation<sup>11</sup>. In any case; blocking IL-6, IL-1 and TNF may be effective. Doctors should try to boost immune response during first phase, while try to suppress it in the second phase<sup>12</sup>.

In preventing lung tissue damage Vitamin B3 (nicotinamide) is highly effective. It might be a wise approach to supply the food supplements which have plenty of Vitamin B3 to the COVID-19 patients<sup>13</sup>.

### Relation of Covid-19, Rasayana and Immune-modulation

Immunomodulation is modulation (regulatory adjustment) of immune system, it has natural (Homeostasis- Self regulation) and human induced forms. Immunomodulation as part of immunotherapy, in which immune responses are induced, amplified, attenuated or prevented according to therapeutic goals.

Immunity is the ability to prevent and arrest the progression of disease, it helps in maintaining homeostasis. Similar to innate and acquired immunity as mentioned in modern system, in Ayurveda text, immunity (*Bala* or strength) is of three types, natural (*Sahaja*), chronobiologic (*Kalaja*), and acquired (*Yuktikrut*). Acquired immunity achieved by the use of rasayan drava<sup>14</sup>.

The faulty dietetic habit, lifestyle, stress and continuous exposure to several toxins present in environment resulting in compromised immune system. Vyadhikshamatva (immunity) is depending upon the quality of Dhatuposhana (Nourished Dhatu) and Oja. According to Ayurveda, disease is the resultant of imbalanced Dosha and Dushya which happen due to Ksheena Vyadhikshamatva (Low Immunity). *Mandagni* (weakened fire) present in *Jwara* vyadhi leads to the production of *Ama* (proinflammatory undigested substance), due to which *Amavastha* and weak immune condition arises. The main aims of Ayurvedic management in any disease is to correct the status of *Agni* through the use of *deepana* and *pachana* dravya, thus changes the *Amavastha* stage into *Niramavastha* (devoid of ama) due to which it reverses the pathophysiology and also improves the immune status of an individual.

Therefore, immunomodulation has the importance in medical field to combat against several infective, inflammatory, chronic, autoimmune &

lifestyle diseases. Immune modulators are drugs which provide strength to the immune effector cells i.e. lymphocytes, macrophages, dendritic cells, natural killer cells, cytotoxic T lymphocyte cells etc. these cells work together and protect the body against the antigen<sup>15</sup>. The basic principle and practice of Rasayana is immunomodulation based. It boosts up the Oja (immunity) and Agni function.

#### Ayurveda rasayan therapy indication-

This includes healthy general public and health workers, suspected or quarantined people and patient with a positive travel history / contact history, asymptomatic people negative for covid-19 cases, vulnerable people (Children, pregnant women, elderly age group) and immunocompromised patients.

#### Single rasayan drugs (Immuno-modulator herbs)

**Table 1:** Immunity Enhancers Medicinal plants

S. No.	Medicinal plants	Pharmacological action on immune system
1	<i>Guduchi (Tinospora cordifolia)</i> <sup>16</sup>	Macrophage activation and immunomodulatory property, antipyretic
2	<i>Ashwagandha (Withania somnifera)</i> <sup>17</sup>	Macrophage functions in mice, immunostimulatory activity, antioxidants, anti-inflammatory
3	<i>Amalaki (Embllica officinalis)</i> <sup>18</sup>	Immunomodulatory effects, antioxidants, anti-inflammatory
4	<i>Marich (Piper longum)</i> <sup>19</sup>	Immunomodulatory and antitumor activity
5	<i>Madhuyasti (Glycyrrhiza glabra)</i> <sup>20</sup>	Anti-inflammatory, antipyretic, antioxidant activity
6	<i>Tulasi (Ocimum sanctum)</i> <sup>21</sup>	Immunotherapeutic potential, antiviral, adaptogenic
7	Fenugreek ( <i>Trigonella foenum graecum</i> ) <sup>22</sup>	Immunomodulatory as well as anti-inflammatory and antioxidant effect
8	<i>Neem (Azadirachta indica)</i> <sup>23</sup>	Anti-inflammatory activity, immunomodulatory effects
9	<i>Shirisha (Albizia lebeck)</i> <sup>24</sup>	Antioxidants, antihistaminic, anti-inflammatory activity
10	<i>Mandukparni (Centella asiatica)</i> <sup>25</sup>	Medhya rasayan, immunomodulatory property
11	<i>Shigru (Moringa oleifera)</i> <sup>26</sup>	Antiviral, anti-inflammatory, antioxidant
12	<i>Shunthi (Zingiber officinale)</i> <sup>27</sup>	Antioxidants, antihistaminic, anti-inflammatory
13	<i>Haridra (Curcuma longa)</i> <sup>28</sup>	Antioxidants, anti-inflammatory activity
14	<i>Rasona (Allium sativum)</i> <sup>29</sup>	anti-inflammatory, rasayan for shwas and kasa

#### Compound formulations of rasayan

**1. Sanshamani vati-** Dosage: 2 tabs of 250 mg, twice a day, a unique tablets of *Giloya* (*Tinospora cardifolia*) well known for its platlet forming properties, anti-inflammatory and immunomodulatory properties. 'Guduchi Ghanavati' is mentioned by the name Sanshamani vati in Jvaradhikara<sup>30</sup>.

**2. AYUSH-64-** Dosage: 2 capsules of 500mg, twice a day, Each capsule of AYUSH 64 contains, *Caesalpinia crista* L. (*Kuberaksha*) Seed powder 200 mg, *Alstonia scholaris* R. Br. (*Saptaparna*) Bark Aqueous Extract 100 mg., *Picrorhiza kurroa* Royle ex. Benth (*Katuki*) Root Aqueous Extract 100 mg., *Swertia Chirata* Pexbex. Karst (*Kiratatika*) Whole-plant

Aqueous Extract 100 mg. The medicinal plants present in AYUSH-64, possess anti-inflammatory and immunomodulatory activity, it modulates the secretion of multiple cytokines. The all ingredients present in AYUSH-64 are *Tikta rasatmaka* which possess the *Agndeepak and Amapachak* (anti-inflammatory) properties. It acts as an amapachaka, as it converts the metabolic status from *samavastha* stage into *niramavastha stage of an individual*, thus it restores the normal metabolism and immune system. It may be used as add-on to standard care for early recovery and better outcome in fever and other viral infections<sup>31</sup>.

**3. Agastyaharitaki -** Dosage: 10 gm / 1 table Spoon, once a day, Its action as Rasayana and Vyadhihara (Rejuvenating & Curative treatment), which is to be used in the diseases of Pranavaha Strotas like kasa (cough), Shwas (Bronchial asthma), pratishyaya (cold), jwar (fever). It gives strength to the Pranavaha Strotas, thus recurrences of respiratory tract infections are reduced<sup>32</sup>.

**4. Chyavanprash -** 10 gm / 1 table Spoon, once a day, on an empty stomach in the morning, it should be taken in such a quantity that it should not interfere the appetite. Diabetic person should take sugar free Chyavanprash. Its main ingredient is Amla (Indian gooseberry), which is the richest source of vitamin C. In Ayurved it has been described as a rasayana, beneficial in a cough, asthma and other respiratory ailments; it nourishes the weak dhatu, promotes vigour, vitality, immunity and it is having an anti-ageing property<sup>33</sup>.

**5. Shirishavaleha** (prepared from heartwood), significant immunomodulatory activity of [30] as well as anti-inflammatory activity in albino rats<sup>34</sup>.

**6. Haridradi Ghrita** shows the Immunomodulatory activity (preferential stimulation of the components of cell-mediated immunity) in rats during a trial<sup>35</sup>.

**7. Ayush kwath** (Herbal tea/decoction) – Drink a special herbal tea made with Tulasi (Basil), Shunthi (Dry Ginger), Dalchini (Cinnamon), Kalimirch (Black pepper) and Munakka (Resins), suggested by experts of ministry of Ayush, GOI, for enhancing immunity. Dosage: 3gms to be boiled in 200ml of water for 5-7 min and when the volume reduced to 150 ml filtered this decoction and can be consumed once or twice a day. If needed jiggery ( natural sugar/ guda) or fresh lemon juice can be added depend on taste of individual<sup>36</sup>.

**8. Triphala Churna-** Triphala is well known Rasayan, that is used for balancing the three doshas in body, it is used as a detoxifying agent of the colon and as a rejuvenator-Triphala preserves and promotes health, immunity and longevity. The individual plants of *Triphala* have been reported to be a rich source of Vitamin C, ellagic acid, gallic acid, chebulinic acid, bellericanin,  $\beta$ -sitosterol and flavanoids<sup>37</sup>. It possesses antioxidative<sup>38</sup> and immunomodulatory activity<sup>39</sup>.

#### Probable mode of action of Rasayan

Rasayana are those which brings the proper uptake of nutrients, growth and nourishment of saptadhatu (seven vital tissues). Rasayana are those which promotes the longevity by delaying the ageing (jaranashanam) and prevents the diseases (vyadhinashan) e.g. amrita, guggul, haritaki<sup>40</sup>. Use of rasayana results in *Dirghayu* (long life), *smiriti* (recapitulating power), *medha, aarogya* (healthy wellbeing), *tarun vaya*

(youthfulness), *prabha*, *varna* (complexion), *voice*, *strength* etc<sup>41</sup>. Rasayana therapy promotes and rejuvenates the physiology of body and produces resistance against diseases. Rasayana is helpful to increase the immunity of the person and helps him to keep away from opportunistic infections in day to day life. The possible roles of Rasayana in our body are nutritive, immunomodulatory, antioxidant, anti-ageing, neuro-protective and haemopoietic. Rasayana therapy acts on the level of Rasa (acting as direct nutrient), Agni (promoting digestion and metabolism), srotasa (promoting microcirculation & tissue perfusion) and oja (enhances immunity). Rasayana may be used as a prophylaxis, as a preventive and health promotive measure in healthy individual.

## CONCLUSION

Immunity of the healthy person and immune-compromised individual can be enhanced with Ayurveda Rasayanas. As, till today, no specific medicine or vaccine is available for the treatment of covid-19. Ayurveda Rasayan may help in boosting of our immunity and thereby promoting the health of individual or public, which is the ultimate requirement in prevention of COVID-19.

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## हिंदी सारांश

### COVID-19 की रोकथाम और स्वास्थ्य संवर्धन में आयुर्वेद रसायन - एक समीक्षा

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पृष्ठभूमि: कोविड -19 एक गंभीर तीव्र श्वसन सिंड्रोम कोरोनावायरस -2 (SARS-CoV-2) के कारण होने वाली एक महामारी है। यह बीमारी विश्व स्तर पर 213 देशों को प्रभावित करती है, 19 जून, 2020 तक 8.62 मिलियन कोरोनावायरस के मामले मिले हैं, और 4,57,326 मौतें हुई हैं। ये लक्षण बुखार, सूखी खांसी, अस्वस्थता हैं जो अधिकांश मामलों में कुछ दिनों में हल हो जाते हैं; लेकिन कुछ मामलों में श्वसन संकट, अंग विफलता और मृत्यु हो सकती है। रोग के लिए प्रभावी टीके और दवाइयां विकसित करने के लिए शोध किए जा रहे हैं, लेकिन आज तक कोई विशिष्ट उपचार या टीका उपलब्ध नहीं है। पूरी दुनिया निवारक उपायों पर ध्यान केंद्रित कर रही है। पुरानी कहावत रोकथाम इलाज से बेहतर है सभी अधिक प्रासंगिक हो गई है। शरीर की प्राकृतिक रक्षा प्रणाली को बढ़ाना covid19 की स्थिति में विशेष रूप से महत्वपूर्ण है और प्रतिरक्षा बढ़ाने वाली आयुष प्रथाओं में पिछले कुछ हफ्तों में जबरदस्त रुचि बढ़ी है। आयुर्वेदिक पाठ में रसायन के रूप में कई एकल औषधियों और यौगिक योगों का उल्लेख किया गया है। आयुर्वेद रसायन को अपना अच्छा होगा, जो इन समय में हमारी प्रतिरक्षा को बढ़ाते हैं। उद्देश्य: अध्ययन का मुख्य उद्देश्य प्राचीन शास्त्रीय और हाल ही में आधुनिक साहित्य और बीमारी के आयुर्वेदिक परिप्रेक्ष्य को समझने और कोविड -19 में आयुर्वेद रसायन द्वारा रोकथाम, स्वास्थ्य संवर्धन, और प्रतिरक्षा-मॉड्यूलन प्रदान करने के लिए पत्रिका की समीक्षा करना है। तरीके: शास्त्रीय आयुर्वेद, हाल के आधुनिक साहित्य, प्रासंगिक पत्रिकाओं की समीक्षा की। शीर्षक से संबंधित साहित्य का पता लगाया गया है, तर्कसंगतता और साक्ष्य का अध्ययन किया गया है और निष्कर्ष निकाला गया है। निष्कर्ष: आयुर्वेद रसायन हमारी प्रतिरक्षा को बढ़ाने में मदद कर सकता है और इस प्रकार व्यक्ति या सार्वजनिक के स्वास्थ्य को बढ़ावा दे सकता है, जो कि COVID-19 की रोकथाम में अंतिम आवश्यकता है। रसायन की लाभकारी क्रियाओं को नैदानिक और प्रायोगिक अध्ययनों के माध्यम से वैज्ञानिक रूप से सिद्ध किया गया है, जो संभावित रूप से रोग के बोझ को कम करने में मदद करेगा।