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# Rasayana as panacea in Covid-19 w.s.r. to Janapadodhwamsa

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## ABSTRACT

In *Ayurveda* the foremost aim is to prolong life and to promote perfect health and secondary aim is to eradicate the disease and dysfunction of the body. *Ayurveda* science wreathes us with the knowledge of how to maintain long and disease-free life and code of conducts. *Acharya Charaka* has been described *Janapadodhwamsa*, in *Viman Sthana* and considered as the chapter of epidemiological study, where he mentioned the whole concept on handling the situation of pandemic state in which *Rasayana* have important contribution. Now, a days the pandemic state of SARS-CoV-2 and their new variants like U.K., Brazil and South Africa which have mutation properties causing pressure on health care system and which feels the necessity of internationally unified clear and collective actions by the individuals, communities, commercial bodies etc. due to the novelty of the virus. Hence, SARS-CoV-2 can be correlated with *Janapadodhwamsa* and *Rasayana* is panacea for this disease, which provide strength against the virus and improve the immune response towards this pandemic disease. This article focuses on information about mechanism of action of immune modulating effect of *Rasayana Dravyas* which should incorporate in day to day life and act as immune modulators.

**Key words:** Epidemic, SARS-CoV-2, Rasayana, Pandemic, Immune modulators.

## INTRODUCTION

An epidemic disease is the rapid spread of infectious diseases to a large number of peoples during in a given population within a short period of time, usually two weeks or less. Epidemics are generally caused by several factors including change in ecology of the host population, a genetic change in pathogen reservoir or the introduction of emerging pathogens to a host population. Generally, an epidemics occurs when host

immunity to either an established pathogen or newly emerging novel pathogen is suddenly reduced below that is found in the endemic equilibrium and the transmission threshold is exceeded.<sup>[1]</sup> A Pandemic is an epidemic of disease which spread across a large number and instance multiple continents in world. Since December 2019, whole world is suffering from such pandemic disease called as COVID-19. COVID-19 has been declared as pandemic by WHO, has rasping affect globally. Coronavirus disease i.e., COVID-19 is caused by novel coronavirus, it is also known as SARS-CoV-2. It is zoonotic origin disease which comes from civet cats, camels, bats. The most common symptoms of coronavirus disease is fever, cough and shortness of breath.<sup>[2]</sup> In *Ayurveda* this epidemic disease mentioned as *Janapadodhwamsa* in *Vimansthan* of *Charak Samhita*.

## Relation between COVID-19 and Janapadodhwamsa

Coronaviruses (Co-V) are a large family of virus. This virus causes illness in animals and humans. Animals that get infected with these viruses spread this

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infection into living organisms. In humans several coronaviruses can cause respiratory infection. This respiratory infection can be simple illness like common cold as well as severe illness such as Middle East Respiratory Syndrome and Severe Acute Respiratory Syndrome (SARS-CoV-2). Coronaviruses are zoonotic in origin, meaning they are transmitted between animals and people. Novel corona virus is constrained disease; therefore, we have only available option is preventive measures. Structurally it is positive strand RNA virus emerged from bat virus as having the genetic similarity to bat coronaviruses. SARS-CoV-2 has four structural proteins: Spike (S), Envelop (E), Membrane (M) and Nucleocapsid (N) in which the first three are viral envelop and (N) is RNA genome. According to WHO, this infection has only the mode of transmission i.e., droplet infection. Naturally it originates from sneezing, talking and breathing which includes different type of cells i.e., epithelial cells, cells of immune system etc. and it contain mucus, saliva as well as some infectious agents like bacteria, viruses, fungi etc. and hence, this virus is potent to cause the mass and spread over 202 countries till date.<sup>[3]</sup>

Acharya Charak described Janapadodhwamsa in Vimansthana that can be compared with endemic, epidemic, pandemic where Adharma is Moolkarana and Pragyaparadh is Yoni for Janapadodhwamsa Vyadhies. Here, Adharma means the person who is not following Dincharya, Ritucharya, Aharvidhi and Sadvrutpalana will leads to Vyadhi. Pragyaparadh is mistake of intellect; the mistake performed by intellect in 3 categories - Dhi, Dhriti, Smriti. Acharya Sushruta deliver the concept of Janapadodhwamsa while discussing Ritucharya (seasonal regimen) under the title Maraca, is known as the destruction or annihilation of settlements or community. Outbreaks of diseases or epidemic have occurred since immemorial time. There are four factors responsible for mass infection in the community are Vayu, Jala, Desh and Kala. Now, question arises then why this mass infection is there, even if a person having the different immunity setup, different lifestyle etc. the answer is even if a community dissimilar in cases of its

constitution and other attributes of an individuals, but due to the infected uncommon causative factors the people of the community may infected in large numbers. That is what happened in the infection of COVID-19. This biological evolved virus causes the uncommon factors mentioned above and further responsible for the mass destruction. Now this situation refers to Janapadodhwamsa.<sup>[4]</sup>

#### Pathogenesis of SARS-CoV-2<sup>[5]</sup>

Spike protein facilitate the host cell → Use ACE2 receptors of human → To enter cell → And attach to target cell and cell's protease TMPRSS2 open the spike protein of virus → Virion release RNA into the cell and forcing cell to produce copies of the virus and infect more cell → Atleast three virulence factors produced and promote shedding virion from host cell → Inhibit immune response

#### Mechanism of action of Rasayana

According to Ayurveda, disruption in equilibrium of Dasha and Dushya results in diseases, and this imbalance happen due to Ksheena Vyadhikshamatva (low immunity). Due to disturbed Ritucharya and Dincharya the Vyadhishamatva of the individual is decreasing day by day and hence, they become vulnerable for infection. So, to destroy pathogens of this disease, we must consume those Dravyas which amplify the immune system. Immune modulators are those which administer 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 defend the body against the antigen.<sup>[6]</sup> The primary and most leading treatment is the Rasayana Chikitsa for this epidemic condition for improving the immunity and strength of the body. There are numerous Aushads in Ayurveda which have the Rasayana effect.

दीर्घायुः स्मृतिं मेधामरोग्यमं तरुणं वयः ।

प्रभावरुणस्वरौदार्यं देहेन्द्रियबलं परम् ॥

वाक्सिद्धिं प्रणतिं कान्तिं लभते ना रसायनात् ।

लाभोपायो हि शस्तानां रसादीनां रसायनम् ॥ (च.चि.1/7)

*Rasayana* is nothing but a therapy which provides the strength to the body to combat the disease. It enriches the basic *Dhatu* i.e. *Rasa* which further resulted in *Sapta Dhatus* of optimum quality and hence, body, soul and mind gets their nourishment. Further, it resulted in the compact body with lustre, good immune power. *Rasayana* therapy acts on the level of *Srotas* and hence, to overpower the self-limiting disease, we should use the *dravyas* causes *Samprapti Vighatana*. *Rasayana* act on three levels of biosystem

1. At the level of *Agni* by promoting digestion and metabolism
2. At the level of *Srotas* by promoting microcirculation and tissue perfusion
3. At the level of *Rasa* itself by acting as a direct nutrient

*Rasayana* promotes nutrition by direct enrichment of the nutritional quality of *Rasa* means nutritional blood, by promoting nutrition through improving *Agni* means digestion, metabolism and by promoting the competence of *Srotas* means microcirculatory channels in the body. It has been reported that the *Rasayanas* are rejuvenators, nutritional supplements and possess strong antioxidant activity.<sup>[7]</sup> They also have an antagonistic action on the oxidative stressors, which give rise to the formation of different free radicals. In order to investigate the mechanism of action of *Rasayana* i.e., *Tinospora cordifolia* studies are carried out on the proliferative fraction of the bone marrow of mice by flow cytometry and found that compared with normal mice, there was a significant increase in the proliferative fraction in the bone marrow in mice treated with *Tinospora cordifolia*. Some *Rasayana* activate mononuclear cells to produce cytokines like GM-CSF and IL-1 in a dose-dependent manner. These results indicate it is possible that the *Rasayana* (particularly those with *Madhur Vipaka* that are advocated as adaptogens in *Ayurveda*) primarily activate immune cells, leading to secretion of cytokines, which in turn act on multiple target organs to produce the myriad effects ascribed to these treatments.<sup>[8]</sup> Administration of herbal preparations, *Rasayana* has been found to enhance the natural

killer cell activity in normal as well as in tumour-bearing animals. *Aswagandha Rasayana* also found to activate macrophages. *Rasayana* are also found to stimulate antibody-dependent complement-mediated tumour cell lysis. The *Rasayana* herbs seem to exert their effect through immunosuppressant, immune stimulant and immune adjuvant activities or by affecting the effector arm of the immune response.<sup>[9]</sup>

### Rasayana and their Immune Modulating Effect

*Dhatuposhan* and *Oja* are responsible for *Vyadhikshamatva*. For the healthful longevity, it is quite essential to work upon the *Rasa*, *Agni* and *Srotasa* level which are done by the *Rasayana* therapy. *Rasayana* may be used in two ways, first as a prophylactic medicine and second as a preventive measure in healthy people.

#### 1. *Ashwagandha (Withania somnifera)*

*Ashwagandha* known as *Balda* (which provides strength), *Gandhapatri*, Indian winter cherry and Indian ginseng, is a major herb in *Ayurveda* and contains withaferin A, withanone, withasomnine as major chemical constituents used for immunomodulation, fight against infectious agents, stress relieving and modify physical and mental health. *Ashwagandha* amplifies nitric oxide synthetase activity of the macrophages, which help in improving immune cells. *Withania somnifera* glycoprotein (WSG) is a vigorous source of antimicrobial activity. *Ashwagandha* helps to reinstate immune homeostasis by providing immune-suppression or immune stimulation effects. *Ashwagandha* provides anti-viral immunity by increasing Interferon gamma (IFN-gamma responses) and anti-inflammatory activities by decreasing the quantity of Interleukin -1, Interleukin-6 which are the main factors related to COVID-19. *Ashwagandha* may be an effective agent in the management of COVID-19 infection by modulation of host Th-1/Th-2 immunity. *Ashwagandha* aid to amplify the immunogenicity and constructive effect on symptoms in conjunction with anti-tuberculosis drugs used as a directly observed treatment, short-course (DOTS).<sup>[10]</sup>

## 2. Guduchi (*Tinospora cordifolia*)

*Guduchi* is best *Rasayana*, because of its protean quality. It is also known as “*Amrita*” (on consumption death never comes), *Tantrika* (defend the longevity of whole family). *Guduchi* have *Tikt* and *Kashya Ras* due to which it consist *Agnideepana*, *Balya*, *Jwaraghna* and *Ama Nashaka* properties and useful for the upper respiratory tract infection, general debility, fever, bronchitis, gout etc. *Guduchi* appease the *Doshas* and resulting in balancing all the *Dhatus* because it consist *Guru & Snigdha Guna*, *Ushna Veerya* and *Madhura Vipaka*<sup>[11]</sup> so, called as the *Rasayan*.<sup>[12]</sup> It can be used in many ways like *Swarasa*, *Satwa*, *Kashaya* etc.

Chemical constituents of *Guduchi* are diterpenoid lactones, alkaloids, glycosides, steroids, sesquiterpenoid, phenolics, aliphatic compounds and polysaccharides.<sup>[13]</sup> According to *Acharyas*, the antigen releases *Ama* (endotoxins) and which leads to *Vyadhi* (disease). Because of *Amapachana*, *Agnideepana*, *Jwaraghna* and *Balya* properties *Guduchi* amplify the killing property of macrophages and acts in infectious disease. *Guduchi* is known to be a rich source of trace elements (Zinc and Copper) which act as antioxidants and protects cells from the damaging effects of oxygen radicals generated during immune activation.<sup>[14]</sup> Novel (1,4)-alpha-D glucans, the activated compound activates the macrophages through signalling of TLR6, translocation of NF kappa-B and production of cytokine and enhance the phagocytosis. In some studies, it was also found that it decreases the IgM and increase in Hb which is responsible for more oxygen carrying capacity were observed.<sup>[15]</sup>

## 3. Amalaki (*Embllica officinalis*)

*Amalaki* is known as “*Shiva, Shri Phala, Amrita Phal*”, and having foremost place among anti-ageing drugs and considered as the one of the best *Dravya* for *Rasayana* effect which is responsible for the *Sandhaniya Karma* (Improves Cell migration and Cell binding) and *Ayushya* (Prolonged Cell Life).<sup>[16]</sup> *Amalaki* have significant role and place in *Veda, Shiva purana, Padma Purana, Ramayana, Charaka Samhita, Sushruta Samhita* etc. It contains an anti-oxidant,

Vitamin C, Tannin and Gallic Acid. *Amalaki* is the essential drug and termed as “*Amalaki Vayasthaapanama Shreshthama*”.<sup>[17]</sup> It has low molecular weight hydrolysable Tannins which act as the best anti-oxidant herb. *Amalaki* Fruit contains all the five *Rasas* (*Madhura, Amla, Tikta, Katu, Kashaya*) except *Lavana* which alleviates the all three *Doshas* and balance all the *Dhatus* of the body.<sup>[18]</sup> *Amalaki* useful in the mitigation of *Pitta Dosh* more predominately because of *Guru, Ruksha* and *Sheeta Guna* and also having *Sheet Virya* and *Madhur Vipaka*. A study suggested that *Amalaki* shown immunostimulant activity and moderate cytoprotective activity.<sup>[19]</sup> But to get the desirable pharmacological action one need to triturate *Amalaki Churna* with *Amalaki Swaras*. The contents like tannins, alkaloids, phenolic compounds, amino acids and carbohydrates are proved to be having antipyretic effect. Extracts of *Embllica officinalis* fruits possess potent antipyretic and analgesic activities.

## 4. Haridra (*Curcuma longa*)

*Haridra* drug mentioned in several *Ayurvedic* literatures included *Samhita, Nighantu, Chikitsa Grantha* and *Rasa Grantha*. The study reveals that plant *Haridra* has special attributed with properties like *Dahahara* (alleviating burning sensation), *Ruja Hara* (alleviating pain), *Varnya* (complexion promoter) and *Vishodhana* (cleansing of the body) etc. According to *Nighantu, Haridra* is *Katu, Tikta* in *Rasa, Ruksha* in *Guna, Ushna* in *Veerya* and *Kapha-Pitta Shamaka* in properties.<sup>[20]</sup> *Curcuma longa* (*Haridra*) commonly known as turmeric is a common ingredient in spices and act as a health supplement. It is also applied in different curative applications such as blood purifying, wound healing, and inflammatory disorders and holds a prominent position in traditional Indian medicinal system.

The key constituent is curcuminoids, those are potent anti-inflammatory agents working through multiple mechanisms, such as.<sup>[21]</sup>

- Suppression of the activation of nuclear factor (NF)-kappa B,
- Inhibition of cyclooxygenase (COX)-2,

- Down-regulation of the expression of cell proliferation, anti-apoptotic, and metastatic gene products.

*Haridra* has an important function in cellular response of many immune cell types, i.e., T cells, B cells, macrophages, neutrophils, natural killer NK cells and dendritic cells<sup>[22]</sup> and hence, act as immune modulator. *Haridra* has property of anti-inflammatory, anti-oxidant and chemo-preventive due to the constituents like turmerones and sesquiterpenoids.<sup>[23]</sup> *Haridra* has polysaccharides content due to which enhances the host defence mechanisms and therefore it is important herb in COVID-19 (*Janapadodhwansa*). Polysaccharides and polysaccharide containing plant products have been demonstrated for immune-modulatory activity in various pre-clinical and human clinical models after oral administration. In addition, polysaccharides have been shown to be bioavailable in various in vivo and human clinical models after oral administration.<sup>[24]</sup>

### 5. *Mulethi (Glycyrrhiza glabra)*

The major components reported in *Mulethi (Yashtimadhu)* is glycyrrhizin, glycyrrhizic acid, glycyrrhetic acid and glabrine etc. as major chemical constituents which inhibits replication of the SARS-associated virus. *Mulethi (Yashtimadhu)* enhance the resistance against the herpes simplex virus type 1 (HSV-1) by Type I and II interferons (IFN) and Th-2 cytokines secretion. It has anti-viral activity against Human immunodeficiency virus (HIV), potent immunomodulatory, and antioxidant activity. It has anti-inflammatory, antipyretic and antioxidant properties. It also mentions as *Rasayana* in *Ayurvedic* texts.<sup>[25]</sup>

### CONCLUSION

The world is facing many epidemic disease H1N1 (Swine flu), Ebola virus, Zika virus, Nipah virus, Chikungunya, Novel corona virus and still the new variants of SARS-Co-V e.g. Covid-19 U.K. variant (B.1.1.7) has 23 mutations, South Africa variant (B.1.351) multiple mutations, Brazil variant (P.1) has 17 mutations are coming and due to lack of

availability of management of these viral disease, a mass destruction happening hence to save the life of humans the above mentioned *Rasayana Dravyas* has important role in immunity enhancement and provide strength to combat the disease or *Janapadodhwansa* (epidemic condition). The constant exposures to several toxins in the present era lead to compromised immune system. Therefore, immunomodulation should be central in medical field to combat several infective, chronic, autoimmune and anti-viral or any epidemic disease.

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