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Review Article

Preventive measures of Ayurveda and Yoga for Covid-19 ProphylaxisYallabandi Sita Priya Darsini^{*a}, J. Ravi Kumar Reddy^a, D. Basava Raju^b^aDepartment of Regulatory affairs, Shri Vishnu College of pharmacy, Bimavaram Andhra Pradesh, India 534202.^bDepartment of pharmaceutical sciences, Shri Vishnu college of pharmacy, Bimavaram, Andhra Pradesh, India-534202.**Abstract**

Covid -19 outbreak is now a frustrating entity to the medical field and having dreadful impacts on the global health care system & its economy. A standard timeline of treatment for this entity is not yet being established. This situation demands an alternative search for its treatment in other science & also emphasises the importance of its prevention in the current situation by improving immunity. The basic aim of this paper is to search for various treatment & preventative regimes in *Ayurveda, Yoga, Pranayama, and Meditation* for the management of different communicable diseases. Various references in Ayurveda show that both preventative & curative aspect of airborne communicable diseases can be fulfilled with the help of Ayurveda. By the adopting Ayurvedic measures such as following proper *Dincharaya, Rutucharya, Sadvritha, Achara Rasayana, Panchakarma, Shaman Cikitsa & Rasayana, Yogapachara, Spiritual therapies, Dhoojana Karma*; both physical and mental health can be maintained & occurrence & spreading of such diseases can avoid. During this covid 19 pandemic, peoples maybe got stress and depression. To avoid such conditions used pranayama and meditation for better treatment. This was an encouraging development and a good initiative for the treatment.

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E-mail address: yallabandipriyadarsini@gmail.com (Yallabandi Sita Priya Darsini).**1. Introduction**

During COVID-19 pandemic is unique and unprecedented in several aspects and has challenged health care systems. (1) People wear masks and hand gloves for preventive against coronavirus. Earlier severe acute respiratory syndrome (SARS) epidemics appear as inadequate and call for better approaches and strategies in public health and medical care. The current prophylactic measures are insufficient, and suggested options such as hydroxyl chloroquine (HCQ) are still under investigation. (2,3) The prophylactic and therapeutic potential of traditional and complementary medicine systems such as Ayurveda and Yoga is not being considered during this crisis and the global hunt for effective preventive and treatment measures. Ayurveda and Yoga as add-on therapy may support patients of COVID-19 by improving the quality of standard care. Research and therapeutic strategies for COVID-19 have focused on agents to attack the virus or immunises against it. Ayurveda pays particular attention to the host and recommends measures for a healthy lifestyle rather than the mere prescription of medicine. (4)

The interventions include therapeutic cleansing procedures (known as Panchakarma) and certain immunomodulators (known as Rasayana). Local and systemic interventions to boost the immune system have been advocated to manage respiratory illnesses. Several general measures described below may be useful to reduce the risk of SARS-COV-2 infection and complement therapeutic management as an add-on treatment. (5)

2. Ayurveda for Public health

In India, Ayurveda is a way of life for many people. However, many scientists are wary of using this treatment procedure today because some Ayurveda medicines contain herbs, metals, and other ingredients that may be harmful if used incorrectly. This is, as yet, no scientific evidence that this healing technique can cure COVID-19. But if reports are to be believed, it helped one patient, who was treated only with Ayurvedic medicines, recover within a short period. Ayurveda and Yoga as add-on therapy may support patients of COVID-19 by improving the quality of standard care. (6)

Ayurveda focuses on the host response and it includes herbal preparations as well as measures for a healthy lifestyle to better cope with various stressors, including infection shown in figure 1. Then this concept of stimulating immune function is a cornerstone of Ayurvedic practice. The authors discuss local prophylaxis, including the use of Ayurvedic practices to help block virus entry to the body and passage to the lungs. It may include consumption of hot water, hot food, and herbal drinks, gargling with medicated water, and steam inhalation. Systemic prophylaxis focuses on overall health and it includes factors such as diet, sleep, mental relaxation, lifestyle behaviors, and yoga. The authors describe the science supporting Rasayana therapies, a specialty of Ayurveda that deals with rejuvenation and can stimulate immunity. They note botanicals that are effective in immunomodulation and restoration of immune homeostasis. (7,8)



Figure 1. Covid-19 has led to an increase in demand for immunity-boosting Ayurveda products

3. Local Prophylaxis

The eyes, nose, and mouth are the main portals of entry of droplets carrying the SARS-COV-2. Before the final assault in the lungs, the virus gains access to the throat region and stays for some hours. The fatty acid coat of the virus adheres to the moist mucosal layers, which helps it gain entry into the cells by binding to specific cell receptors. Ayurveda classics mention several interventions that are likely to target these entry portals. This may help to improve their innate immunologic response of the mucus membranes and may thus inhibit the virus transmission to the lungs. These measures may be function as “physiological masks” barricading the viral invasion. The general measures for respiratory illnesses described in Ayurvedic texts. Such as consumption of hot water, hot food, and herbal decoctions, gargling with medicated water, steam inhalation, and local applications may be helpful for their symptomatic relief in mild cases.

Medicated water

Drinking hot or warm water is a popular home remedy for many ailments. Ayurveda also advocates this as a measure for improving the digestion of Ama, a proinflammatory product of impaired metabolic

disorders. The presence of Ama is linked to that increased susceptibility to infections. Traditionally, warm water is consumed in many parts of India for diverse disorders of fever, inflammation, metabolism, and allergy such as rhinitis and asthma. (9) Several spices that are popularly used in the kitchen are added as single or multiple agents to the boiling water and consumed as medicine throughout the day. These spices include dry ginger (*Zingiber officinale*), yashtimadhu (*Glycyrrhiza glabra*), and nut-grass (*Cyperus rotundus*) rhizomes; khus (*Vetiveria zizanioides*) and Indian sarsaparilla (*Hemidesmus indicus*) roots; coriander (*Coriandrum sativum*) and fennel (*Cuminum cyminum*) seeds; and cinnamon (*Cinnamomum Verum*) and catechu (*Acacia catechu*) barks.

Mouth rinse and gargle

Warm liquids and oils are used as gargles (gandusha) or mouth rinses (Kavala) to cleanse the mouth and throat thoroughly. This can also have a systemic effect. The oils or oily decoctions clean the oral cavity, pharynx, and tonsillar area and are likely to coat the mucosa as biofilm and induce additional immune-modulatory, antioxidant, and antimicrobial benefits. The paramount role of this host mucosal immunity in controlling infectious agents is well known. Turmeric (*Curcuma longa*) rhizome, yashtimadhu, or licorice (*Glycyrrhiza glabra*) stem, neem (*Azadirachta indica*), and catechu (*Acacia arabica*) barks, and natural salt may be used to prepare medicated water/solutions for gargles/mouth rinse. Gargles with these medicated decoctions have demonstrated beneficial effects in xerostomia (dry mouth), postoperative sore throat, oral ulcers, gingivitis, and bacterial growth. Glycyrrhizin, an active component in licorice was found to be more effective than common antivirals in inhibiting the replication of the SARS virus and inhibited its adsorption and penetration. (10) Yoga texts recommend cleansing of the nasal passage with salt water (Jala neti). The efficacy of saltwater in upper respiratory infections has been reported in randomized controlled trials (RCTs), although more conclusive evidence is needed.

Nasal oil application

Ayurveda recommends the application of medicated oils made from butter oil (Ghee) and vegetable oils such as sesame or coconut in the nostrils. This may protect their respiratory tract from pathogen entry. This procedure known as Nasya is as well described in Ayurveda. The application of pure sesame oil was found to be effective for the treatment of dry nasal mucosa. Similar to gargles and the mouth rinses, nasal oil application possibly forms a biofilm and can help as a barrier to the entry of the virus particles. Researchers of Traditional Chinese Medicine have already proposed the use of nasal oil application for preventing the SARS-COV-2 infection.

Steam inhalation

Steam inhalation and hot fomentation (with aromatic oils such as menthol) provide satisfactory clinical relief in nasal and throat congestion, bronchoconstriction, headache, and sinusitis. Its role is to improve nasal conditioning, improving nasal mucus velocity, and

reducing congestion and inflammation has been reported in several clinical studies.

4. Systemic Prophylaxis

Ayurveda advocates several non-pharmacological measures that are critical to overall health, including diet, sleep, mental relaxation, lifestyle behavior, and Yoga. Several studies have endorsed its role of Yoga breathing techniques (pranayama), postures (asanas), and

procedures (yogic kriya) to improving lung health and exercise tolerance. The recommended daily diet includes fresh hot soups of vegetables (radish, Trigonella leaves, drum stick vegetable pods) and pulses (lentils, green gram/mung beans, chickpeas) seasoned with spices such as ginger (*Zingiber officinale*), garlic (*Allium sativum*), cumin seeds (*Cuminum cyminum*), and mustard (*Brassica nigra*) seeds (black whole mustard) in figure 2.



Figure 2. Coronavirus Treatment: Traditional foods in Home.

5. Rasayanas as Immunomodulators

Rasayana, a specialty of Ayurveda, it deals with measures for rejuvenation. (11) Rasayana therapy comprises the lifestyle, diet, and medicine that have properties to enhance growth, retard aging, induce tissue regeneration, and stimulate immunity. Due to its effects on improving immunity, Rasayana therapy may have direct relevance to the prophylaxis and management of SARS-COV-2 infection. (12) The botanicals used in Rasayana therapy are effective in immunomodulation and restoration of immune hemostasis. It describes the immune response to SARS-COV-2 infection in two phases. The first protective phase of an adaptive immune response in the host that may eliminate the virus in a large proportion of subjects. In relatively few cases, the viral infection progresses, causing an intense release of proinflammatory cytokines (cytokine storm). The cytokine storm results in severe inflammations, leading to the lung damage and co-attendant multi-organ failure. Thus, although antivirals are important, a robust and well-contained immune response to maintain immune homeostasis will be critical for good recovery and reduced mortality. It requires a favourable Th1/ Th2 cytokine balance.

Several Rasayana botanicals described in the Ayurveda are used in clinical practice for strengthening immunity. Based on our research data, we find *Withania somnifera* (Ashwagandha), *Tinospora cordifolia* (Guduchi), *Asparagus racemosus* (Shatavari), *Phyllanthus Emblica* (Amalaki), and *Glycyrrhiza glabra* (Yashtimadhu) are potential immunomodulators. Such Rasayana botanicals may be considered for COVID-19 prophylaxis and as an add-on treatment. (13)

Here, we present a few details on Ashwagandha is an example. We have carried out several in vitro, animal,

and clinical studies over the last two decades to demonstrate primarily the immunomodulatory and antioxidant effects of Ashwagandha. We have largely focused on its clinical benefit in inflammation, arthritis, and cancer, but it has been used in several other disorders. The selective Th1 upregulation by aqueous extract of Ashwagandha roots has been shown in a mice model. Ashwagandha aqueous extract has a broad-spectrum dose dependent role in the immune homeostasis. Based on available data, we suggest that they can be used appropriately; Ashwagandha may be effective in improving host immunity through the modulation of key targets relevant to COVID-19.

We have demonstrated the clinical effects of Ashwagandha containing Ayurvedic formulation to be equivalent to HCQ in an RCT for treating rheumatoid arthritis. Figure3 depicts potential mechanisms of action of Ashwagandha in prophylaxis (antiviral, immune-boosting, vascular integrity) and management (pyrexia, anti-inflammatory, conserving alveoli) related clinical targets of COVID-19. Therefore, we suggest that selected Ashwagandha formulations may be effective as a prophylactic and adjunct treatment of COVID-19. In our opinion, Ashwagandha might be a better and safe alternative to the disease-modifying drugs such as HCQ. We recommend further research to determine the clinical efficacy of Rasayana drugs such as Ashwagandha, Guduchi, Amalaki, and Yashtimadhu.

"This protocol dealing with the preventive and prophylactic measures is a significant step not only in the management of Covid-19 but also to making traditional knowledge relevant to solving problems of this modern time," Vardhan was quoted as saying in a statement.

The protocol lists dietary measures, yoga, and Ayurvedic herbs and formulations such as Ashwagandha and AYUSH-64 for prevention of

coronavirus infection and treatment of mild and asymptomatic cases

Role of Withania somnifera in COVID-19 Management

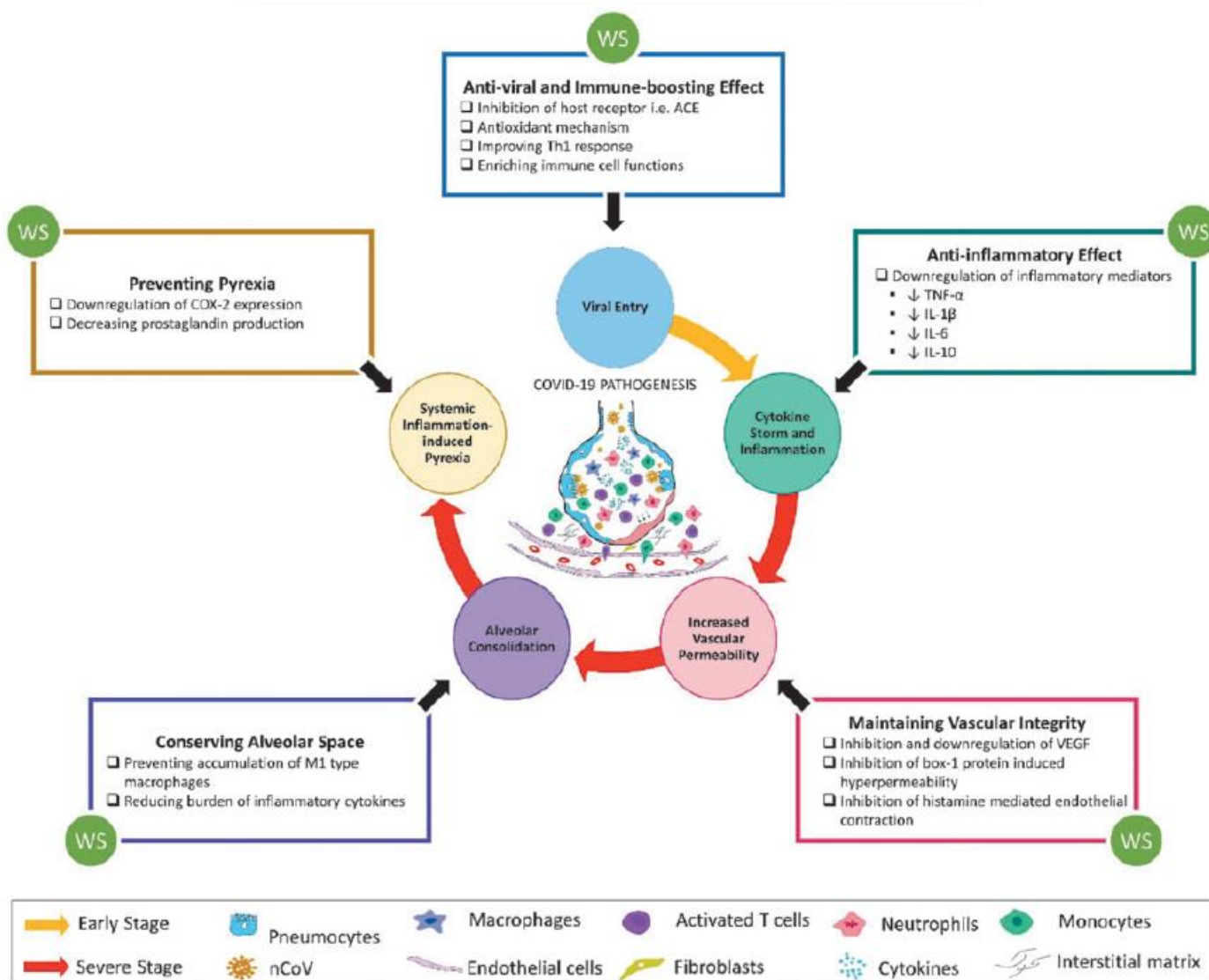


Figure 3. Potential mechanisms of action of *Withania somnifera* in prophylaxis (antiviral, immune-boosting, vascular integrity) and management (pyrexia, anti-inflammatory, conserving alveoli) related clinical targets of COVID-19(12). ACE, angiotensin-converting enzyme; COX 2, cyclooxygenase 2; IL, interleukin; TH1, T helper type 1; TNF a, tumor necrosis factor-a; VEGF, vascular endothelial growth factor; WS, *Withania somnifera*. The ‘National Clinical Management Protocol based on Ayurveda and Yoga for Management of Covid-19’ was released by Vardhan in the virtual presence of Shripad Naik, Minister of State for AYUSH.

The document also listed Ashwagandha, Chyawanprasha, or Rasayana Churna for post-Covid-19 management to prevent lung complications like fibrosis, fatigue, and mental health.

6. Yoga, Pranayama, and Meditation for Mental Health

They saw that Poor mental health conditions, including stress and depression, are known to increase the risk of acute respiratory infections. Rising the numbers of COVID-19 cases and deaths possibly raise the stress and anxiety, while loneliness and depressive feelings are likely due to mandatory social distancing

measures. Certain forms of meditation, yoga, and pranayama, along with their potential implications for counteracting some forms of infectious challenges. Consideration of the mind is another distinction between Ayurveda and Yoga.

Several measures for mental health are to be described, including pranayama and meditation. Pranayama is known to improve lung function. (14) Meditation is found to reduce inflammation markers and influence markers of the virus-specific immune response. Yoga including meditation could be a simple and useful home-based practice for the prevention and post-recovery management of COVID-19 (15, 16); because yoga and

meditation stimulate melatonin. This may be useful, when it comes to treating SARS-CoV-2 as a melatonin offers protection against lung injury caused by a ventilator in animal models figure 4.

7. Discussion



Modern medical care and health systems are being tested to the hilt for effective management of COVID-19. However, there are several gaps. We must remember the basic principle in medicine that “prevention is better than cure.”



Figure 4. Pranayama, Yoga, and Meditation

The simple and be feasible measures based on Ayurveda and Yoga could be quickly advertised in public-health campaigns through electronic and print media and information brochures for the public distribution and display at prominent locations. The Ministry of AYUSH, Government of India, has already issued a very useful advisory in this context. People are overstressed by the compulsions of social distancing and physical barrier methods. They are likely to find the comfort and support in some of the deeply rooted traditional practices that may be protecting them from the infection and its associated debilitating conditions. Noticeably, these interventions have the advantages of simplicity, affordability, and acceptability and appear promising as feasible measures for large-scale implementation. Ayurveda, Yoga, and meditation have a potential role to engage the community in creating a more positive healthy environment. Admittedly, requires need for more research. It was welcome news to learn that the United States National Institutes of Health, National Center for Complementary and Integrative Health has engaged in a stress-related initiative and is reportedly considering others. Another timely initiative is the launch of traditional, complementary, and integrative health and medicine for COVID-19 support registry for document practices and products. The evidence presented here should draw the attention of stakeholders, including the World Health Organization, to the unexplored potential of traditional medicine systems and adopting integrative approaches in the search for solutions for the COVID 19 crisis. It is high time to embrace integration with an open mind.

8. Conclusions

Considering various preventive or curative measures of Ayurveda in the form of specific seasonal & dietic regime, proper *Vyayam*, rational & appropriate use

Ayurvedic drugs, Shodhana Upakrama, Homa, Havana & Yoga, Satvavajaya Chikitsa, Rasayana Chikitsa, Acharya Rasayana & Sadavrutta Palana, Yoga practices, Dhoopana therapy which are based on different basic principles of *Ayurveda* can be applied cumulatively for prevention & management of COVID-19. The basic aim of this paper is to search for various treatment & preventative regimes in *Ayurveda, Yoga, Pranayama, and Meditation* for the management of different communicable diseases. All these sources help to prevent and control the vicious cycle of infection by limiting their sources, preventing the routes of transmission, minimizing portals of entry, and protecting susceptible patients by improving immunity. All the above factors can be highly recommended for persons of the active phase and who are in the quarantine stage or those who are in a vulnerable group for COVID -19. However, further extensive research is needed to establish their authenticity, applicability in the present situation & to identify their limitations in various aspects of such disease condition.

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Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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