

Ayurveda: A Boon in Pandemics

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ABSTRACT

Population around the world is dealing with an unrivalled pandemic of viral disease severe acute respiratory syndrome coronavirus 2 leading to severe acute respiratory syndrome. The novel coronavirus has affected people worldwide with more than 1.43 million confirmed cases and 82,100 deaths as per data recorded on April 8, 2020. The pandemic has elevated the distress in common people including the psychological conditions with symptoms such as depression and anxiety. The psychological distress is linked with variation in the functioning of immunological responses including high level risk for viral infections of the upper respiratory tract. The extent of pandemic requires exploration of traditional as well as modern knowledge systems obtainable worldwide. Use of traditional Chinese Medicinal system in Wuhan for the treatment of patients suffering from coronavirus disease 2019 (COVID-19) has set an example illustrating the efficiency of traditional ways of healthcare as an addition in treatment of patients of COVID-19. In India, Ayurveda is medicine system with historical roots encouraged by Government of India as "immune booster regime." Implementation of Ayurvedic knowledge and administration of Ayurvedic dosages with the present scientific studies on related clinical settings is an efficient plan for intervention in India for the treatment of patients suffering from COVID-19. In accordance to severity of symptoms and stage of infection among the patients, Ayurvedic dose regime can be administered in both symptomatic and asymptomatic patients. Implementation of Ayurvedic medicinal system will ease learning and develop evidence as we cannot combat the reality that there is no evidence-based treatment for COVID-19. Therefore, Ayurvedic system of medicine should be implemented immediately to abate the impact of pandemic in terms of diminishing both psychological distress and risk of infection. Development of such elucidatory models will shed the light on the effectiveness of traditional medicines and medical practices during disease surges and could aid the symbiosis between traditional and modern medicinal system.

Keywords: Ayurveda, Immunity, Severe respiratory syndrome, Traditional medicine

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INTRODUCTION

Mankind all across the world is suffering from the impact and consequences of severe acute respiratory syndrome coronavirus 2 which is an infectious disease caused by novel coronavirus. Coronavirus disease 2019 (COVID-19) has challenged health care system and efficiencies of all the countries across the globe as this pandemic is unrivalled in few aspects.^[1] The COVID-19 infection has elevated the psychological stress such as symptoms of depression and anxiety in general public. This stress is associated with change in functioning of immune system including the risk of several infections especially the respiratory tract viral infections. Many studies are linking psychological stress with body's immune responses including to the viral infection of COVID-19. Ayurveda is Indian traditional medicine system having historic roots encouraged by Indian Government. Government released an "immune booster regime" along with number of guidelines based upon the point of views of Traditional Ayurvedic doctors also known as "vaidyas" entitled "Ayurved's immunity boosting measures for self-care during COVID-19 crisis." Many measures in given guidelines were found to influence immunity either directly by reducing the stress, depression, or anxiety or by their characteristic features. Implementation of such traditional practices might play significant role in terms of improving the standards of life as well as decreasing the chances of infections.^[1] The COVID-19 pandemic with over 7,214,471 cases and 4,09,033 deaths reported to date June 9, 2020. This pandemic has affected the mental health of groups of people at high risks such as doctors, nurses, Pharmacists, helping staff, Cleaning Staff, Health care volunteers, and Policemen's.^[2] Unalterable working schedule and dreadful pandemic of COVID-19 has elevated the levels of psychosocial factors such as stress, anxiety, and depression which is adversely affecting the immunity and immune functioning leading to high

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susceptibility to viral infections^[3] and also to response generated by vaccines.^[4] The relationship between the psychological distress and immunological response to COVID-19 viral infection is a matter of attention as it is biologically reasonable.

In India, various innate systems of medicine such as Unani, Siddha, and Ayurveda system are used by the large population along with modern system of medicine.^[5] Due to firm faith of huge section of Indian population on these innate traditional systems, Government of India with the opinion of sixteen vaidyas assigned a number of guidelines entitled "Ayurveda's immunity boosting measures for self-care during COVID-19 crisis." By considering the potential of traditional systems, Kerala one of the southern

states of India has also initiated the use of Ayurveda in the prevention of further spread of COVID-19 after being successful in flattening the curve of COVID-19. On the basis of possible spread of COVID-19 infections government of Kerala has classified the population in seven different classes and suggested Ayurvedic treatment accordingly (Medical Dialogues Bureau, 2020).^[6]

Kerala is known for its elite Ayurvedic system of medicine in India. Considering the example of Kerala, several other states are also promoting the therapies and preventive measures against COVID-19 as per the Ayurvedic set of guidelines. Ayurvedic therapies are potential enough to be employed as parallel treatment or as preventive measure for stopping the spread of COVID-19.

There are 4.28 lakh registered Ayurvedic doctors and around 2818 Ayurvedic hospitals and 15291 Ayurvedic dispensaries in India.^[7] Conclusively, it can be stated that there are adequate human and service delivery resources in India for the implementation of COVID-19 mitigation program by prophylactic use of Ayurvedic medicines and also deploying Ayurveda Human Resources and services for asymptomatic cases on large scale. The defense system of human body has an important role in fighting against various infectious diseases caused by pathogenic microorganisms such as bacteria, fungi, and viruses. Immune system provides multi-level defense network against microbes mediated by early line defense reactions by innate immunity and later responses of adaptive/acquired immunity through the production of antibodies. Ayurveda has similar concept such as innate and acquired immunity according to which (Bala or strength) is categorized into chronobiologic (Kalaja), natural (Sahaja) and acquired immunity (Yuktikrut). Various treatment options are provided by Ayurveda for enhancing immunity in case of respiratory infections which include certain immune modulators known as Rasayana, local, and systemic interventions.

There are some interventions and preventive measures which are given below:

LOCAL PROPHYLAXIS

Ayurveda prescribes various local prophylaxis measures for respiratory tract infections such as consumption of herbal decoctions, drinking hot water, steam inhalation, and gargling with medicated water. Acceptance and implementation of these interventions on large scale can be opted because they are simple and affordable. Traditional measures also influence the mental health positively and modulate the immune functioning through psycho neuroimmune pathways. Traditional medicine systems such as Ayurveda and Yoga are proving themselves as potential additive therapy and effective prophylaxis for the viral infection of COVID-19. Ministry of AYUSH, Government of India, 2020 has disclosed a number of guidelines by considering traditional Ayurvedic principles and other alternative medicine systems for improving the immunity and self-care during this COVID-19 crisis.

Prime Minister of India in his addressal to nation also mentioned the use of home remedies^[8] and Ayurvedic medicines as per Ayurvedic system for improving the immunological responses against the infection of COVID-19. He recommended to follow dietary measures like consumption of warm liquids throughout the day and use of condiments such as haldi, jeera, dhaniya, and lahsun while cooking for meal preparations. "Practice of Yogasanas, pranayama and meditation for at least 30 min daily is also beneficial for health" he added. Yoga, meditation, and traditional practices improve attribute of living by reducing the psychological stresses leading to reduction in risk of infections.

AYUSH network has directed to be on alert for being called anytime to fulfill the demand of Ayurvedic medication and serve the nation in this pandemic time. Ayurvedic remedies have competence to be used in both preventive and complementary treatment for COVID-19. This fact has up surged the demand of Ayurvedic medicine in Indian market. Central Government of India has also released "National Clinical Management Protocol based on Ayurveda and Yoga for the management of COVID-19." Union Health Minister suggested the use of Ayurvedic medicinal preparations including ashwagandha, Guduchi Ghana Vati, and Chawanprash as prophylactic care.

Health authorities such as Ministry of AYUSH, Government of India has also released the guidelines and all other general health care measures advising people to wear masks, use of hand sanitizers, follow social/physical distancing to break the chain of transmittance COVID-19. Few dietary measures such as consumption of nutritious food for improving the immunity are also recommended. Other methods for self-care and improving the immune system responses are listed below:

DRINKING WARM WATER

Best and popular home remedy for many diseases is the consumption of hot/warm water. Various disorders of inflammation, fever, metabolism, and allergy such as asthma and rhinitis, hot water consumption is assumed as cure in most of areas of India from ancient times. Several spices and condiments that are used in the kitchen are added to the boiling water and used as medication throughout the day. These spices include Liquorice (*Glycyrrhiza glabra*), dry ginger (*Zingiber officinale*) and Nut-grass (*Cyperus rotundus*) rhizomes; Indian sarsaparilla (*Hemidesmus indicus*) roots; and khus (*Chrysopogon zizanioides*); coriander (*Coriandrum sativum*); black pepper (*Piper nigrum*) and fennel (*Foeniculum vulgare*) seeds; and cinnamon (*Cinnamomum verum*). Some of the examples are:

IMMUNITY BOOSTING PLANTS

Neem (*Azadirachta indica*)

Neem has antiviral, antifungal, and antibacterial activity. It also acts as blood purifier by flushing the toxins out and keeps the blood clean. It is useful in preventing the body from attacks by pathogens such as virus and bacteria which helps in strengthening of immunity.

Tulsi (*Ocimum sanctum*)

Tulsi is also called as "wonder herb" which is much preferred in Ayurveda. The leaves from this aromatic plant can be our primary line of defense or our natural immunity against coronavirus. Tulsi plant is a very effective germicide. Plant comprises phytoconstituents having antioxidant property which can destroy the bacteria and viruses as they enter in to body. By chewing a few leaves of tulsi in the morning, we can improve our immunity. In food, we can also add tulsi leaves with few drops of boiled water.

Moringa (*Moringa oleifera*)

Moringa has 7 times more Vitamin C as compared to oranges and it is the main ingredient for making the immunity strong. Moringa

herb has high levels of nutrients such as potassium, iron, calcium, and amino acids due to which it provides strength to cells, muscles, and tissues.

Ashwagandha (*Withania somnifera*)

Ashwagandha is an adaptogen which reduces stress levels in our body. Stress level decreases the immunity and immunological responses of the host and makes the body more vulnerable to viral infections. During this pandemic, we can reduce the risk of spread of coronavirus infection by consuming Ashwagandha.

Fenugreek (*Trigonella foenum*)

It is a natural antioxidant herb in the Ayurvedic system of medicine which strengthens immune system. It has high content of Vitamin E. It is also used as a condiment in maple syrup for artificial flavoring or in the production of steroids. Fenugreek seeds also act as preservatives in pickles because they are rich in Vitamin E.

Ginger (*Z. officinale*)

Ginger has been used in flu and the common cold from ancient times. It can also be effective against COVID-19. It has phytochemical constituent named gingerol which is an antioxidant that can improve our immune system and kill viruses. Ginger has very good effectiveness in treatment of infections of respiratory tract.

Turmeric (*Curcuma longa*)

Turmeric has curcumin a phyto chemical which has tendency to expel out toxins from the body and boost up the immune system to fight against germs and bacteria.

Black Cumin (*Nigella sativa*)

Black cumin extracts can protect our immune system from many viruses and bacteria. Both black cumin seeds and oil act as antioxidants and help to remove out free radicals that weaken our immunity. Table 1 includes all spices with their sources, active constituent, and biological activity:

GARGLE OR MOUTH RINSE

To cleanse the oral cavity and throat various oils and warm liquids are used. Gargles (gandusha) or mouth rinse (kavala) can also have systemic effects.^[9] The use of oils not only cleanses the mouth, pharynx, and tonsillar area but also acts as biofilms by coating mucosal membrane of mouth. These oily decoctions

are likely to create additional benefits such as antioxidant, immune modulatory, and antimicrobial effect. The paramount role of host mucosal immunity in controlling infectious agents is well known. Medicated Decoctions/Solutions for mouth rinse/gargles can be prepared by the use of ingredients such as Rhizomes of turmeric (*C. longa*), Stem of yashtimadhu or liquorice (*G. glabra*), Leaves of neem (*A. indica*), and barks of catechu (*Acacia catechu*). Natural salts can also be used to prepare liquid for mouth rinse.

NASAL OILS

Medicated oils are also recommended by Ayurveda for nasal application. Oils made from Ghee and vegetable oils such as coconut or sesame can be applied in the nostrils. According to Ayurveda application of medicated oils in nostrils can prevent the respiratory tract from the entry of pathogens and this procedure is known as nasya.^[10] Pure sesame oil when applied in the nostrils was found as an impactful method to treat dry nasal mucosa.

STEAM INHALATION

For the condition such as throat congestion, broncho constriction, headaches, and sinusitis use of hot fermentation and steam inhalation with aromatics oils such as menthol provides relief. Improvement in nasal conditioning, nasal mucus velocity, congestion, and reduced inflammation have been recorded and reported in various clinical as well as experimental studies.^[8,11,12]

HEALTHY DAILY DIET

Healthy diet plays important role in maintaining the proper functioning of all the systems of body including the immune system. The recommended daily diet includes consumption of pulses (lentils, green gram/mung beans, and chickpeas) and freshly prepared steaming soups of vegetables such as trigonella leaves, and radish. Pulses and soups can be seasoned with spices such as ginger (*Z. officinale*), garlic (*Allium sativum*), cumin seeds (*Cuminum cyminum*), and mustard seeds.

YOGA: STRESS BUSTER

Mental health is an important aspect of healthy life as deficient mental health and conditions such as stress, depression, and fluctuating moods can highly impact and enhance the possibilities of respiratory tract septicity.^[13] As the cases of COVID-19 are fluctuating every day in numbers which may increase unease in common people. Social distancing is mandatory to break the chain of spread of COVID-19, but

Table 1: Name of the spices with their source and active constituents

Name of spice	Source	Active constituent	Biological activity
Ginger	<i>Zingiber officinale</i>	Gingerol	Anti-inflammatory and anti-oxidant
Liquorice	<i>Glycyrrhiza glabra</i>	Glycyrrhizic acid	Immune boosting and Anti inflammatory
Nut-grass	<i>Cyperus rotundus</i>	α -cyperolone	Anti-inflammatory
Khus	<i>Chrysopogon zizanioides</i>	Vetivone, zizanal	Antioxidant and antimicrobial
Indian sarsaparilla	<i>Hemidesmus indicus</i>	Lupiol, amyirin	Antioxidant and antimicrobial
Black pepper	<i>Piper nigrum</i>	Piperin	Antimicrobial
Fennel	<i>Foeniculum vulgare</i>	Anethole	Antibacterial and antioxidant
Cinnamon	<i>Cinnamomum verum</i>	Eugenol	Antimicrobial, antifungal, antioxidant and antidiabetic
Coriander	<i>Coriandrum sativum</i>	linalool	Antibacterial, antifungal and antioxidant
Turmeric	<i>Curcuma longa</i>	curcumin	Anti-inflammatory, antioxidant, and antibacterial

this distancing is giving rise to depressive feeling by creating atmosphere of loneliness and helplessness. Considering the mental health is another distinction of Ayurveda and Yoga. To keep the morals high several measures for good mental health are described by our traditional systems which includes pranayams and meditation. Daily practice of Pranayamas like kapal Bharti is known to enhance lung functions.^[14] Meditation is found to reduce inflammation markers and influence markers of virus-specific immune response. Yoga is a simple and useful home-based remedy for the prevention and post-recovery management of COVID-19. Various studies endorsed the breathing techniques (pranayama) mentioned in Yoga, postures (asanas), and procedures (yog kriya) for the improvement of overall health including exercise tolerance.

PROGRESSING SUBSTITUTE NUTRACEUTICALS

Nutrition is the basic need of the body. Various diseases and deficiencies related to health are adverse outcome of insufficient nutrients in food and imbalanced diet. In India, large number of populations especially children below the age of 5 years is underweight and undernourished. Large population is having high calorie intake as compared to nutrient intake. This is due to access to resources but lack of awareness regarding the nutritional requirement of the body. According to facts 30% of urban population and 34% rural population in India consume more calories than recommended along with high consumption level of dietary fibers which is a core reason of India for most of the heart diseases and diabetic patients in the world. Additional intervention is required because deficiency of micronutrients exist in both areas urban as well as rural. Such intervention is required to prevent nutritional deficiencies and supplement the diet and promote well-being. A nutraceutical can be described as a product which is food or food component assuring the prevention of disease and health benefits. The emerging concept of nutraceuticals fulfills the nutritional requirements and promotes well-being. Nutraceutical products can be obtained from natural sources as well as produced synthetically (man-made) to supplement the nutritional requirements over regular food. The raw material for natural nutraceuticals can be obtained from herbal drugs which help in prevention above the treatment of diseases without any sort of side effects. The Indian nutraceutical market is flourishing day by day with estimated worth of about 1 billion USD. Along with herbal home remedies, dietary supplements are gaining importance as they are rich in various macro and micro nutrients such as vitamins, minerals, amino acids, carotenoids, and oils. They are to be ingested in form of oral pills, tablets, capsules, or liquids. These "designer" foods may also comprise of processed food items such as soups, beverages, and cereals. Botanical's products can be marketed in form of extracts, tablets, fresh or dried products, capsules, tea bags, powders, etc. Nutraceuticals can be further categorized under three categories which are functional food, Dietary Supplements, and Functional Beverages. These categories are based on the need of people according to their lifestyle.

CONCLUSION

The best possible ways to prevent the spread of viral infection COVID-19 is to break the chain of transmittance and also by boosting the immunity of people across the country by various means. Traditional Indian Medicinal system "Ayurveda" places great emphasis on prevention and encourages the maintenance of health through close attention to balance in one's life, right thinking, diet, lifestyle, and the use of herbal drugs and herbal preparations. Knowledge of Ayurveda enables one to understand that by the use of simple measures and change in lifestyle can restores the balance of functioning of body. Implementation of Ayurvedic medicinal system will ease learning and develop evidence as we cannot combat the reality that there is no evidence-based treatment for COVID-19. Therefore, Ayurvedic system of medicine should be implemented immediately to abate the impact of pandemic in terms of diminishing both, psychological distress and risk of infection. Development of such elucidatory models will shed the light on the effectiveness of traditional medicines and medical practices during disease surges and could aid the symbiosis between traditional and modern medicinal system.

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