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Ayurveda Practitioners Consensus to Develop Strategies for Prevention and Treatment of Corona Virus Disease (COVID-19)

Ashok Kumar Panda[1], Amit Kumar Dixit[2], Suvendu Rout[3], Baidyanath Mishra[4], Umesh V. Purad[5], Sarbeswar Kar[6]

[1]Research Officer, Central Ayurveda Institute for Hepatobiliary Disorders, CCRAS, Ministry of AYUSH, Govt. of India, Bhubaneswar, [2]Assistant Director (Biochemistry), Central Ayurveda Research Institute for Drug Development, CCRAS, Kolkata, [3]Head, Department of Kayachikitsa, SJS Ayurveda College, Nazrathpet, Chennai, [4]Director (R&D), Ingex Germany GmbH, Theodor-Heuss-Allee Business Center GmbH. Theodor-Heuss-Allee 112, 60486 Frankfurt am Main, Germany, [5]Principal, DGM Ayurveda Medical College Cum Post Graduation Centre and Hospital, Gadag, Karnataka, [6]Medical Superintendent, SDM Institute of Ayurveda and Hospital, Anchepalya, Bangalore, Karnataka, INDIA.

ABSTRACT

Background: The outbreak of Coronavirus disease (COVID-19) has been recently declared as Public Health Emergency of International Concern (PHEIC) by World Health Organization and the virus has now spread beyond the boundaries of countries and continents. At present, no specific antiviral treatment or vaccine is available or recommended to counter the COVID-19, and the potential therapy is still symptomatic. **Objective:** The primary aim of the study is to review ancient classical literatures and past human treatment protocols of Ayurveda for prevention and treatment of infectious diseases and flu like illnesses, so as to provide guidance for the prevention of COVID-19. **Methods:** Classical Ayurveda and recent modern literature with treatment protocols of Ayurveda for prevention and treatment of flu and infectious diseases were reviewed and COVID-19 has been categorized in four specific situations based on the severity of clinical condition. Total 110 Ayurveda practitioners of different parts of India were participated in the survey. These specific situations were conveyed and described to these participants and their opinions and options were collected through social media platform i.e. WhatsApp or SMS. **Results:** Recommendation and suggestions received from more than 50% participants were taken into accounts to draft the recommendation for probable preventive and therapeutic regimen for the disease. **Conclusion:** The results obtained in the study may provide a preventive strategy to the Ayurveda practitioners as well as common people across the globe by increasing the innate immunity of the body to combat COVID-19. However, till today, social distancing is considered as most effective way to stop the spread of COVID-19. Further, pilot study for different group is recommended.

Key words: *Corona; COVID-19, Pathogenesis; Consensus; Rasayana.*

INTRODUCTION

COVID-19 is becoming a greatest threat to the humanity and civilization by every passing day from the beginning of year 2020. Health organizations across globe are performing exhaustive teamwork and research to control its spread and illness. In late December 2019, China reported a cluster of pneumonia cases with unknown etiology in the people of Wuhan.[1],[2] The pathogen is a novel corona virus named Severe Acute Respiratory Syndrome Corona Virus 2 (SARS - CoV-2), which belongs to the same family of viruses responsible for Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) epidemics in the last two decades.[3] WHO described the onset of a potential Coronavirus outbreak and given the estimate of a reproduction number for the 2019 Novel (New) Coronavirus (COVID-19, name given by WHO on 11 Feb, 2020).[1-4] It is known that the novel

Address for correspondence:
Dr. Ashok Kumar Panda
Research Officer, Central Ayurveda Institute for Hepatobiliary Disorders, CCRAS, Ministry of AYUSH, Govt. of India, Bhubaneswar, Odisha, INDIA.
E-mail: drashokpanda69@gmail.com

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coronavirus invades human cells through its surface spike proteins which attaches to the angiotensin-converting enzyme-2 (ACE-2) receptor on the surface of a host cell. The ACE-2 is like a "knob on door" or ridge and the virus "hijacks" the "knob" using its spike protein, facilitating the opening the door into human cells.[5]

As the COVID-19 outbreak continues to spread in different part of the world, knowledge about its pathogenesis, etiology, behaviour and management is also increasing every day. Results of published epidemiological and virological studies provides evidence that COVID-19 is mainly transmitted from symptomatic people to others, having close contact through respiratory droplets, by direct contact with infected persons, or by touching contaminated surfaces and objects.[6] The incubation period for COVID-19, which is the time between exposure with the virus and symptom onset, is on average 5-14 days. During this period, patients can be pre-symptomatic but can be contagious.[4-7] The common signs of corona virus infection include flu-like, respiratory symptoms, fever, fatigue, cough, shortness of breath, breathing difficulties, while severe conditions may causes pneumonia, acute respiratory syndrome, acute cardiac injury, kidney failure, multi organ failure and even death.[7] Patients of COVID-19 can be with nausea, cough, chills, respiratory symptoms and high temperature is not a general presentation in the early stages of infection. Elevated level of C-reactive protein (CRP) lymphopenia and impaired immunity are important characteristics for COVID-19. A cytokine profile resembling secondary haemophagocytic lymphohistiocytosis (sHLH) is associated with COVID-19 disease severity, characterised by increased interleukin (IL)-2, IL-7, granulocyte-colony stimulating factor, interferon-γ inducible protein 10, monocyte chemo attractant protein 1, macrophage inflammatory protein 1-α, and tumour necrosis factor-α. All these factors suggests cytokine storm and immunosupression.[6] Researchers are developing various rapid molecular and serological laboratory investigations for diagnosis of COVID-19 infection. At present, real-time reverse-transcription polymerase chain reaction (rRT- PCR) based molecular assay tests are being used to detect viral RNA load in clinical samples of COVID-19 subjects. In rare serological tests, enzyme-linked immune-sorbent assay (ELISA), is also considered as a screening test used to detect the presence and concentration of specific antibodies that bind to this viral protein. However, serological investigation is only for surveillance or investigational purposes and still it is not considered for diagnostic purposes.[4-7]

At present, no specific antiviral treatment or vaccine is available or recommended to counter the COVID-19, and the potential therapy is still symptomatic. Oxygen therapy represents the major treatment intervention for patients with severe COVID-19 infection. The primary difficulty in treating COVID-19 is to combat the over reaction of the immune system, which damages lungs and its links for multiple organ failure. Studies suggests that mechanical ventilators may be necessary in cases of respiratory failure refractory to oxygen therapy and hemodynamic support is of upmost importance for managing septic shock.[8] The clinical studies proved that Traditional Chinese Medicine (TCM) can alleviate symptoms of mild and moderate COVID-19. The severe patients suffering from hypoxia, can able to ease symptoms, including fever, coughing and shortness of breath.[9] Studies also suggests that baicalin in *Scutellaria baicalensis*, a TCM herbal ingredient and hesperetin in dried tangerine peel can combine with ACE-2, thus serving as a potent chemical compound for COVID-19.[10],[11] Xuebijing Injection, a TCM medicine, also suggested a significant result in lowering the risk of community-acquired pneumonia and reduce the time ventilators use time of severe patients and their stay in the ICU.[12]

The first case of the COVID-19 infection in India was reported from Kerala State on 30th January 2020, in passengers travelled from China and medical fraternity including AYUSH practitioners been put on high alerts to stop its further propagation and management. AYUSH sector with its classical knowledge has a long tradition of keeping the nation healthy and its role has increased manifold in the

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ongoing efforts to tackle COVID-19. The government through its regulatory bodies, policy makers and research councils emphasized the importance of countering and fact checking the claims of AYUSH having prevention and treatment for the disease and requested to come together for evidence based research. Historically, it is well known that whenever there is outbreak of any flu like illness or viral infection in India, Ayurveda principles and its approaches including oral administration of preventive drugs, herbs, formulae, decoction, indoor herbal medicine fumigation, etc. were recommended for effective prevention and treatment. Research Councils under the Ministry of AYUSH, Government of India have also issued advisory based on the Indian traditional medicine practices i.e. Ayurveda, Homeopathy and Unani before the outbreak in India.[13] Therefore, it is necessary to review of ancient classics of Ayurveda and previous human studies on infectious diseases and flue like illnesses to draft protocols for prevention and treatment of COVID-19.

Since, Vedic period, ancient Ayurveda practitioners and health philosophers were aware of the existence of microorganisms as well as the causation of infectious diseases by them.[14] The word *Krimi* was referred as infectious agent in Vedas, where *Rakshyasa* (drink blood), *Yatudhana* (cause pain), *Pisacha* (eats raw flesh), *Apsara* (swims in water) etc. have been described. Ancient Indian Classics described nearly hundred types of infectious agents. In Mahabharata Vedavyasa narrated that *Krimi* are everywhere and nobody can avoid them. It is also mentioned in classics that *Mahamari* (Communicable diseases) can spread from one person to another through air, water, animal, flies and physical contact. Ayurveda the oldest medical system described fever (Jvara) as a major disease in its Caraka Samhita. The symptoms of the COVID-19 may be correlated with the features of Sannipata Jwara described in Ayurvedic classics. However, In critical cases of COVID-19, it best matches with symptoms described for Sama Sannipata jwara. It comes under Janapada dhamsa vikara and can be grouped in Bhutabhisanga agantuga Vikara (External cause of microbes). Ayurveda principles observe life from outside to inside, from macro to micro, grade of diseases condition (*Vyadhi bala*) or from factors such as climate, constitution of patient (*Prakruti*), psychological influence (*Satva*), body symmetry (*Samhanana*), appetite (*Ahara sakti*) and physical strength (*Vyayama Shakti*). While understanding the etiology and pathogenesis of a disease involving biological agents like bacteria and viruses due attention may be given to immunity (Vyadhi kshyamatva) and self-recovery of the human system. Although there is no direct evidence of Ayurvedic medicine for COVID-19, some of the classical and herbal medications with proven immunomodulatory potential can be used as preventive medicines to counteract its symptoms.[15-20]

Therefore, the primary aim of the study is to review of ancient classical literatures and past human treatment protocols of Ayurveda for prevention and treatment of infectious diseases and flu like illnesses, so as to provide guidance for the prevention of COVID-19. Presently, there are no comprehensive evidence based practice guidelines in Ayurveda to define the therapeutic option for COVID-19. Therefore, this study comprises consensus survey of Ayurveda practitioners on preventive measures and probable treatment option for asymptomatic, mild and moderate clinical conditions of COVID-19.

Materials and Methods

Classical Ayurveda and recent modern literature with treatment protocols of Ayurveda for prevention and treatment of flu and infectious diseases were reviewed and COVID-19 has been categorized in four specific situations based on the severity of clinical condition. Four specific situations were described to the practitioners as 1) Ayurvedic Preventive measures including the Government declared options for apparently healthy individual having no sign and symptom of diseases; 2) High risk individuals those have co-morbidity factors like - COPD, Bronchitis, DM, heart diseases, chronic liver diseases (CLD), Immune suppression therapy and geriatric person/those having history of immigration to other country/who

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declared self isolation or quarantine/pre-symptomatic phase patients; 3) Asymptomatic positive cases / Afebrile with only chills and respiratory symptoms in early stage of infection without dyspnea and hypoxemia; 4) Uncomplicated Corona-19 infected patients means febrile without dyspnea and hypoxemia. The Institutionally qualified Ayurveda practitioners and who are willing to participate in this survey were included in the working force. Total 110 Ayurveda practitioners of different parts of India participated in the survey. These specific situations were conveyed and described to these participants and their opinions and options were collected through social media platform i.e. WhatsApp or SMS.

RESULTS

The information was asked from total 202 Ayurveda practitioners from different parts of India and only 110 have participated in the survey, out of which 76 participants (69%) are with post graduate degree in various disciplines of Ayurveda. Recommendation and suggestions received from more than 50% participants were taken into accounts to draft the recommendation for probable preventive and therapeutic regimen for the disease. Nitya Rasayana in form of Haridra milk or 10 ml of Cow ghee (Emulsified fat) with rice/roti, Chyawanprash Avaleha - 10g and Pranayama along with fumigation with Ayurvedic drugs were collectively recommended by all participants as Ayurvedic Preventive measures including the government declared options for apparently health individual who no sign and symptom of COVID-19 illness (Table 1). Nitya Rasayana in form of Haridra milk or 10 ml of Cow ghee (Emulsified fat) with rice/roti and Gudduchi tablet/Samsamana Vati in recommended dose and along with fumigation were recommended by all participants for High risk group/geriatric person/having history of immigration to other country/who declared self isolation or quarantine/ re-symtometic phase patients (Table 2). Nitya Rasayana in form of Haridra milk - or 10 ml of Cow ghee (Emulsified fat) with rice/roti and Gudduchi tablet/ Samsamana Vati in recommended dose and Sudarsana Ghana Vati in recommended dose were advised for all participants for asymptomatic positive cases/Afebrile with only chills and respiratory symptoms in early stage of infection without Dyspnea and hypoxemia patients (Table 3). Sudarsana Ghana Vati, Amrutadi Kasaya and Suvarna Vasanta Malati Rasa in its recommended doses were advised by all participants for Uncomplicated COVID -19 infected patients whose temperature > 37^0 c without dyspnea and hypoxemia (Table 4).

Table 1: Ayurvedic preventive measures including the government declared options for apparently healthy individual with no sign and symptom of COVID-19(n=110).

Ayurveda medicaments	Dose	No. of practitioners with positive response
Decoction of Sunthi, Lavang, Pippali, Maricha, cinnamon bark, teja patra	2 gm each in 200ml water reduced to 50 ml - 50 ml twice empty stomach	75
Haridra milk or Cow ghee (Emulsified fat)- 10 ml with rice/roti	5 gm Haridra boiled in 250 ml of milk and reduced to 200 ml	110
Chyawanprash Avaleha	10gm once before break fast	110
Aswagadha tablet - 250mg	2 tab twice after food	59
Amalaki Churna	10 gm at night along with Luke warm water	67
Dhopana of house by Resin of saal (Sarjja rasa), Neem leaves, coconut shell and hingu	Morning and evening Fumigation Smoke allergic patients should avoid	110
Pranayama	10-10 min twice	110

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	Morning and Evening	

Table 2: Ayurvedic preventive measures for High risk group/geriatric person/those have history of immigration to other country/who declared self-isolation or quarantine/ pre-symtometic phase of COVID-19 (n=110).

Ayurveda medicaments	Dose	No. of practitioners with positive response
Sudarsana ghana vati -250mg	2 tab twice daily after food	75
Gudduchi tablet / Samsamana Vati -250mg	2 tab twice after food	110
Nitya Rasayana Haridra milk or Cow ghee(Emulsified fat) - 10ml with rice/roti	5 gm Haridra boiled in 250 ml of milk and reduced to 200 ml, Twice a daily	110
Chyawanprash Avaleha / Fortified Chauvan prash with Gold and silver particle	10gm once before break fast	99
Dhupana of house by Resin of saal (sarjja rasa), Neem leves, coconut shell and hingu.	Morning and evening Fumigation Smoke allergic patients should avoid.	110
Pranayama	10-10 min twice	100

Table 3: Ayurvedic preventive measures for asymptomatic positive cases/Afebrile with only chills and respiratory symptoms in early stage of infection without Dyspnea and hypoxemia phase of COVID-19(n=110).

Ayurveda medicaments	Dose	No. of practitioners with positive response
Sudarsana ghana vati	2 tab twice daily after food	110
Gudduchi tablet/ Samsamana Vati	2 tab twice after food	110
Nitya Rasayana- Haridra milk or Cow ghee (Emulsified fat) - 10 ml with rice/roti	5 gm Haridra boiled in 250 ml of milk and reduced to 200 ml, Twice a daily	110
Vyagri haritaki	10gm twice daily with luke warm water before food	59
Kusmanda Avaleha	10gm twice daily with luke warm water before food	76
Agathi haritaki	10gm twice daily with luke warm water before food	62
Bilvadi gulika -125mg	2 tab twice daily with luke warm water before food	73
Siddha Makaradwaja -125mg	1 tab with 2-4 drop of honey in mornig empty stomach	78
Kapha ketu rasa -125 mg	2tabs with one spoon of fresh tulsi juice	82
Saubhgya vati -125mg	2tabs with one spoon of fresh parijata leave juice	90
Talisadi churna	10gm twice before with honey /luke warm water	72
Arogya vardhini Rasa -250 mg	1 tablet –twice daily with water after food	67

Table 4: Ayurvedic preventive measures for uncomplicated COVID-19 infected patients having temperature > 37^0 c without dyspnea and hypoxemia (n=110).

Ayurveda medicaments	Dose	No. of practitioners with positive response
Sudarsana ghana vati	2 tab twice daily after food	110
Amrutadi kasayam	20ml twice ith 20 ml luke warm water before food	110
Sanjeevani vati -125mg	1 tablet before food	80

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Suvrnna Vasanta Malati Rasa -125mg	1tabs twice with one spoon of fresh parijata leave juice	110
Sadanga Paneeya	Quantity sufficient as required when felt thirst	92
Sammera Parnaga Rasa -60 mg tab	One tablet twice with honey when kapha predominant more	65
Vyagri haritaki	10gm twice daily with luke warm water before food	99
Ayush -64-250 mg cap	2 capsule twice with water	66
Agathi haritaki	10gm twice daily with luke warm water before food	92
Bilvadi gulika -125mg	2 tab twice daily with luke warm water before food	73
Purna chandra Rasa 125mg	1 tab with 2-4 drop of honey in mornig empty stomach	78
Kapha ketu rasa -125 mg	2tabs with one spoon of fresh tulsi juice	82
Saubhgya vati -125mg	2tabs with one spoon of fresh parijata leave juice	90
Talisadi churna	10gm twice before with honey /luke warm water	72
Arogya vardhini Rasa -250 mg	1 tablet –twice daily with water after food	62

DISCUSSION

In present scenario, it is clear evident that spread of COVID-19 is unstoppable and it has infected more than 77,000 people and already taken lives of 2200 people worldwide (as on 22 Feb 2020). Therefore, a coordinated global response between the health organizations with a collaborative and co-operative intention is the ultimate requirement to meet this unprecedented challenge of COVID-19. Sharing of medical advices, clinical data, investigations protocols, precautionary measures drugs and life saving equipments between the countries having experience of COVID-19 management will be very valuable lessons to pass on.

In India, Ayurveda being the ancient medical science has a great importance in diseases management with its ultimate goal of ensure complete and comprehensive health i.e. Mental, physical and social and the classical literature of Ayurveda is all about maintaining the equilibrium status of the of body tissues. As per Ayurveda the progression of any disease should be stopped at the earliest possible stage (Sanchaya & Prokapa). In case of infectious diseases, it is always advisable that stopping the further progression is the most ideal for controlling the disease, and immunity whether innate or acquired should be increase by various means, which ultimately ensures, that even with the exposure of the infectious disease pathogens, disease is not going to be manifested in the body.

In the present study, all Ayurveda Practitioners recommended Ayurveda medicines are classical, however Ayush-64 is research based formulation of CCRAS, which is widely used in malaria and different fever by Ayurveda practitioners. Most of the recommended formulations were also advised by Ministry of AYUSH. The decoction of Sunthi (*Zingiber officinale Roscoe.*), Lavanga (*Syzygium aromaticum (L.) Merr. & L.M. Perry*) and Maricha (*Piper nigrum* Linn.) advised in healthy person is not only provide humoral and cell mediated responses but also reduce the air way hyper responsiveness and nasal congestion.[21-23] Ayurveda products and fatty acids in form of ghee are implicated in the up-regulation of immune function. They control the immune system in a pleiotropic manner and participate in various processes of the adaptive/innate immunity.[24] Haridra (*Curcuma longa Linn.*) has active constituent curcumin which blocks cytokine release, most importantly the key pro-inflammatory cytokines, interleukin-1, interleukin-6 and tumor necrosis factor-α, which is advisable to take with milk. The suppression of cytokine release by curcumin correlates with clinical improvement in experimental models of flu and

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infectious diseases and can be compared with COVID-19 where a cytokine storm plays a significant role in mortality.[25] Chauvan prasha has been demonstrated useful in treating respiratory problems, allergic cough and bronchitis, common cold and strengthens respiratory tract as immune-boosting agent.[26] Similarly, *Sudarshana Ghana Vat*i is the derived formulation of Sudarsana churna which has good response in malarial fever and allegic rhinitis.[27] One of the recommended drug in the present consensus i.e. Gudduchi Tablet (*Tinospora cordifolia (Willd.) Miers*) is a potent immuno-modulator in viral infection.[28-29] *Vasanta Malati Rasa* is a well known *Kharaliya Rasayana.*[30] Parijata (*Nyctanthes arbor-tristis* L.) is used to treat fever of all kind including malarial fever and have analgesic, anti-inflammatory, anti-viral, anti-bacterial, anti-spasmodic, anti-pyretic, anti-allergic, Anti-fungal, immuno-modulator, insecticidal, respiratory stimulant and anti-malarial properties.[31-33] Tulasi (*Ocimum sanctum L.*) is a good anti-viral agent even treating viral encephalitis.[34] Thus, the formulations of four different clinical situation recommended by all participant have ample scientific data in experimental model to satisfy its immune-modulator and antiviral activities in COVID-19 management. The recommendations of Ayurvedic drugs received in this study for COVID-19 are on the basis of their personal experience and historical knowledge of the infectious diseases. These recommended drugs have established potential of immunity boosting which is the ultimate requirement to stop the spread of COVID-19 and can also be taken into consideration for its management along with modern drugs.

Conclusion

The results obtained in the study may provide a preventive strategy to the Ayurveda practitioners as well as common people across the globe by increasing the innate immunity of the body to combat COVID-19. For present, it appears inappropriate and premature to recommend any therapies for COVID-19, however, immunity of the healthy person and immune-compromised can be enhanced with these recommended Ayurveda drugs to defend against the infection. However, till today, social distancing and sanitizations measures is considered as most effective way to stop the spread of COVID-19. The ultimate requirement at this point is that Ayurveda or other medicine systems needs interdisciplinary research and should be performed in chorus with the researchers who can contribute to such research. Further, pilot studies for different groups are recommended.

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