

Potential of *Ayurveda* in the prevention and management of post-COVID complications

COVID-19, a global pandemic has affected individuals to varying degrees, ranging from a few days of mild symptoms to respiratory distress requiring intensive care unit (ICU) treatment including ventilator support, and even death. Early in the pandemic, it was believed that COVID-19 was a short-term illness. In February 2020, the World Health Organization reported that from the onset to clinical recovery for mild cases the duration was approximately 2 weeks and that recovery took 3–6 weeks for patients with the severe or critical disease.^[1] However, recently it has become clear that in some patients debilitating symptoms persist for weeks or even months. This means that a subset of people who have recovered from COVID-19 continue to experience symptoms that remain beyond testing negative for the virus. “Long-COVID” or “COVID long-haulers” or post-COVID Syndrome generally describes those persons with COVID-19 who experience symptoms for >28 days after diagnosis.^[2] Though long-term sequelae of COVID-19 are unidentified, but evidence from previous outbreaks demonstrates that the most common conditions are impaired pulmonary and physical function, reduced quality of life and emotional distress, which indicates psychological, physical, and cognitive impairments and has huge downstream effects on a person’s quality of life-impacting family life and work productivity.

Adults over the age of 50, patients who have been critically ill, those that were treated for prolonged periods in ICUs, individuals having co-morbidities particularly cardiopulmonary issues, hypertension, diabetes or obesity seems to be most at risk of developing post-COVID Syndrome. Although, in some people with relatively mild symptoms, who were treated at home, may also have a prolonged sickness, even after recovering from the disease.^[3]

Similar to acute COVID-19, patients with long-COVID may experience multiple symptoms that involve the lungs and other parts of the body. The common symptoms experienced by COVID long-haulers are cough (maybe dry or wet), fatigue, exertional dyspnea, mild to moderate grade of headache, myalgia, disturbed sleep patterns, neuropsychiatric and depressive symptoms.^[4] Many patients may also experience the symptoms of gastrointestinal disturbances such as anorexia, loss of appetite, disturbed bowel habit, etc. Some of these symptoms such as fatigue may be continuous, while others are intermittent.

A key objective in long-term COVID management is to identify and proactively manage complications and support patients through the recovery phase with the goal of preserving their health status. It is necessary to formulate proper treatment

protocol for these patients, to help them restore physical and respiratory function and to reduce anxiety and depression, particularly patients with co-morbidities to restore a good quality of life. Ayurveda has enough potential and possibilities both for the prevention and treatment of long-term COVID. This is the reason why, after recovery from the acute phase of the disease, many patients seek for Ayurveda treatment for long-term lingering side effect. Clinical trials carried out in the past 1 year on the management of COVID 19 has reported that Ayurveda management is beneficial in mild to moderate cases of COVID 19 without long-term lingering symptoms, especially as a add-on treatment. This indicates that even if Ayurveda treatment is taken along with modern medicine in the acute stage, then, side effects may be reduced and there will not be long-term residual symptoms. Findings of one of the study report that an integrative strategy for hospitalized patients which uses Ayurveda management strategies is expected to improve the treatment outcome and minimize risk. This report highlights that despite prolonged hospitalization in the ICU, Ayurveda intervention can prevent deterioration leading to complications, and enable complete recovery.^[5] A case series of 10 cases of mid-aged morbid persons who were managed only with Ayurveda interventions had complete remission in the sign and symptoms of the disease and had better quality of life and none of these patients developed any major complications or persistent symptoms.^[6] These findings indicate that taking Ayurvedic treatment in the acute stage of COVID-19 as the main course or add-on therapy, itself may help for the prevention of post-COVID conditions. Further, implementation of *Ahara Vidhi* (proper dietary regimen), *Dinacharya* (day regimen), and *Sadvritta* (code of conducts) may also play a vital role in the prevention of post-COVID syndrome.^[7]

COVID 19 primarily being a respiratory disorder falls under the category of *Pranavaha Srotosa Dushti* (derangement of the cardio-respiratory system) and post-COVID syndrome can be correlated with the *Jeerna Jwara Avastha* (chronic condition of fever) or *Punaravartaka Jwara* (relapsing fever) or *Kshatakshina* (advanced pulmonary dysfunction) as per Ayurveda. In long-term COVID-haulers, the symptoms may remain or may be relapsed due to various factors like reduced or lack of response from the immune system, using of immunosuppressant drugs for acute stage of the disease, multisystem inflammatory syndrome, prolonged hospitalization due to severity, post-disease stress, and re-infection or mutation of the virus. Impaired immunity characterized by lymphopenia and elevated C-reactive protein levels is an essential clinical feature of post-COVID-19 complications.^[8] The severity and

outcome of the viral infection could be either an outcome of an effective cellular/innate immune response that combats severe acute respiratory syndrome coronavirus 2 as observed in the patients with mild clinical signs of infection or a state of immunosuppression that debilitates and sometimes overwhelms the host's defense.^[9] Hence, optimum state of immunity of the host is a requisite to facilitate the eradication of infections and contribute in preventing the recurrence of the infection. Administration of *Rasayana* may play important role in these conditions, as *Rasayana* therapy of Ayurveda primarily deals with enhancing immunity and/or by managing general debility by rejuvenating body tissues. *Naimittika Rasayana* principle of Ayurveda focuses on *Apunarbhava Chikitsa* i.e., avoiding the recurrence of the symptoms after treating the diseases and also cures complications of the disease. *Punarnava Mandura*, *Pravalpanchmruta Rasa*, *Shamshamani Vati*, *Chavyanaprasha Avalehya*, *Kushmanda Rasayana*, *Rasayana Churna*, *Ashwagandha Rasayana*, and *Vardhamana Pippali Rasayana* are proven *Rasayana* remedies in the management of post-COVID syndrome.^[7,10,11]

Ministry of Health and Family Welfare, Directorate General of Health Services (EMR division) has also issued post-COVID management protocol which includes Immunity promoting AYUSH medicines like *Ayush Kwatha*, *Samshamani Vati* or *Guduchi* powder, *Ashwagandha* powder, *Aamalaki* fruit or *Aamalaki* powder, *Yashtimadhu* powder, warm milk with *Haridra* powder and Gargling with turmeric and salt under the direction of registered Ayurveda physician.^[12] The procedures such as *Abhyanga* (therapeutic massage), *Swedana* (fomentation), *Mridu Virechana* (mild purgation), *Sneha* and/or *Kashaya Basti* (medicated enema), *Shirodhara* (pocising medicated liquid on the scalp), *Udvardhana* (dry massage), *Nasya* (therapeutic nasal drop procedures), can also be applied taking into consideration the suitability of the patient and depending upon various symptomatic conditions.^[11]

Further, a number of clinical trials suggest *Yoga* to be effective toward improving pulmonary function. Several mechanistic factors have proposed to underlie the beneficial effects seen in the patients undergoing *Yoga* such as increasing respiratory stamina, relaxing chest muscles, expanding the lungs, raising energy levels, and calming the body.^[13] *Asanas* or physical postures for different parts of the body promote strength, flexibility, and endurance to the body improving respiratory and cardiovascular function. It promotes recovery from several diseases and chronic pain as well as reduces stress, anxiety, depression, improves sleep patterns, and enhances overall well-being and quality of life.^[14,15] Breathing exercises using the concepts of *Yoga* could also be adopted to help during states of acute respiratory distress. *Pranayama*, a *Yoga*-based respiratory exercise, is a simple and cost-effective intervention that could be easily integrated into daily routine and has been proven beneficial in subjects across different age groups including the elderly.^[16] Repeated practice of *Pranayama* has been shown to strengthen cardio-respiratory

coupling and increases in parasympathetic activity in healthy individuals.^[17] *Kapalabhati* aids in appropriate training and toning of the diaphragm and abdominal muscles. It also helps in the removal of secretions from the bronchial tree, cleansing up respiratory passages and the alveoli.^[18] Further, *Yoga* has also been reported to be an effective intervention for stress management and improvement in psychological health,^[19] which is affected in most of the COVID long-haulers. Hence *Yoga* can be formulated as an add-on strategy for the prevention and management of post-COVID syndrome.

The current COVID-19 pandemic along with post-COVID syndrome has raised many questions to the medical fraternity for which Ayurveda can be the solution in regard to its prevention and treatment. The Ayurvedic fundamental principles if applied as per the disease condition can certainly prevent the disease at the very first stage. The treatment plans as suggested by AYUSH having an immune-modulatory effect can certainly combat the disease. The *Rasayana* therapy and the common *Yoga* protocol mentioned by the AYUSH is an important tool in dealing with the management of post-COVID syndrome. To evaluate the exact mechanism and proposal of any particular drug or therapy further studies are necessary from the field of AYUSH.

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