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Potential of Rasayana (Ayurvedic) polyherbo-mineral formulation in prophylaxis of COVID-19 infection

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ABSTRACT

Introduction: The coronavirus pandemic has become a cause of global concern because of its fast rate of transmission and high mortality rates in patients with comorbid illness. In absence of any vaccine or approved chemoprophylaxis, this threat will keep on increasing till effective solution is found. The ministry of AYUSH, Government of India, has released guidelines for use of certain herbs as an immunity booster in order to reduce the risk of COVID-19 infection. Since the onset of the pandemic, several patients are approaching the practitioners for alternative medicine advices that will enhance overall health and keep diseases at bay. Although the herbs, which are used as immunomodulators to reduce the risk of COVID-19 infection, have long history of use but there is paucity of well documented and published data about its tolerability, safety and efficacy. **Aims and Objectives:** To study the outcomes of Ayurveda herbs treatment in individuals residing in coronavirus hotspot city. **Materials and Methods:** Individuals, who have approached our Ayurveda clinic, have received Ayurveda formulation containing *Glycyrrhiza glabra, Zingiber officinale, Adhatoda vasica, Piper Longum, Piper Nigra, Acorus calamus* and *Sacrum offcinarum*. These herbs have been consumed orally for about two months. **Result:** The herbs are well tolerated by all and none of the individual have developed any symptoms of influenza like illness or tested positive for COVID-19. These observations indicate that immunomodulator herbs mentioned in Ayurveda are well tolerable and safe. **Conclusion:** This formulation can be considered as preliminary evidence for the tolerability, safety and can be used as a prophylactic herbs, mentioned in Ayurveda. In view of the scarce information available for this newly appeared pandemic, such results can serve as a primary basis for carrying out further studies. Further investigations and clinical studies using the Ayurveda herbal medicine, described in this work, may help in reducing the risk of COVID-19 infection by boosting our immunity.

Keywords: COVID-19, Prophylactic herbomineral treatment, Ayurveda.

INTRODUCTION

The current pandemic coronavirus disease 2019 (COVID-19) requires urgent attention of all the stakeholders of health. In absence of any licensed vaccine or effective drug for the treatment or prevention of coronavirus disease, the public health interventions like social distancing, hand hygiene, cough etiquettes and quarantine have become the critical strategy towards the prevention of its spread. The preparedness of optimum health care facilities continues to be a global challenge.

India has a population of over 1.3 billion, and some of the areas are densely populated. Social etiquettes of the people like coughing, sneezing and spitting have made India more vulnerable for community spread. The current strategy of Government of India encompassing nationwide lockdown, identification and containment of hotspots, more aggressive testing are the best strategy in the current scenario which have been appreciated across the globe.

Hotspot areas are described as the areas with a higher transmission efficiency or risk, or higher probability of disease emergence [1]. The Indian Government has identified 129 COVID-19 hotspot districts across India. Among these 129 COVID-19 hotspot areas, 10 districts are worst affected which account for at least 45% of the confirmed COVID-19 cases. With around 1300 cases as on 4th May, 2020, Pune district is one of these 10 districts which has a very high prevalence of COVID-19 patients.

Chairman, Rasayu Ayurveda Clinics –Pune, MH, IndiaCurrent evidences suggests that patients with comorbidities e.g. diabetes, cardiovascular disorders, kidney diseases, cancer, or any other chronic disease

are more susceptible and have poor outcome. Also, the elderly people, particularly over 60 years, are more vulnerable. Amongst all the death cases related to coronavirus disease in New York City, 24.6% of the patients belong to the age group of 65-74 years, while 47.7% of the overall death cases are in the age group of 75 years and above. Whereas in China, fatality rate is 22.8 % for the age group of 70 years and above [2]. All the above circumstances have one thing in common, that is a weaker immune system.

Considering the limitation of public health measures, it becomes imperative to have an effective intervention that is affordable, available and acceptable to larger proportion of Indian population.

Exploration of traditional therapies have held a great potential towards reducing the risk of spread of coronavirus disease or prevent its progression in high risk patients. Such intervention, if effective, can certainly help in reducing pressure on overburdened hospitals which require critical supports like oxygen therapy and ventilators. This should also reduce the mortality rate.

Ayurveda is the ancient and most widely used traditional medicinal system of India. Various therapeutic procedures, minerals and botanicals have been mentioned in Ayurveda in order to establish harmony and homeostasis (called as doshasamya in Ayurveda) of immune response and physiological processes.

These interventions have been extensively used since centuries to treat influenza like illness (ILI) and other similar diseases [3]. Recently, the Ministry of AYUSH, Government of India has also released Ayurveda's immunity boosting measures for self-care during COVID-19 crisis [4]. Herein, we have described a therapeutic approach based on principles of Ayurveda that can be beneficial in reducing the risk of spread of COVID-19 infection and may help to reduce mortality in patients with comorbid illness.

We have formulated an oral herbomineral formulation consisting herbs and minerals which are indicated in Ayurveda classics for treating respiratory illness and associated fever. The formulation has been tested for heavy metals and fungal contamination and is coded as Kovi19. It has been administered to subjects who voluntarily visited the clinic seeking Ayurveda medication to reduce the possibility of getting COVID-19 infection or better in fighting infection in case they get it.

MATERIALS AND METHOD

Kovi-19 formulation was prepared with standardized powders of the ingredients (Table 1). This formulation was administered twice daily with warm water after meals.

98 individuals approached Rasayu Ayurved clinic in month of February 2020 for consultation on maintaining good health and well-being and possible ways to prevent COVID-19 infection. A written consent was taken from all voluntarily Ayurvedic medicine seeking persons. They were told that their data can be published while maintaining confidentiality. All subjects were followed up over telephone at weekly intervals and their health records were maintained in electronic database. During each telephonic follow-up, patient's compliance was recorded. All individuals were asked to continue their ongoing medication for any chronic comorbid illness.

Table 1: Ingredients of Kovi-19 formulation in each dose (Administered in divided dose in form of two capsules)

S. No	Ayurveda name of the compound	Botanical /English name	Quantity
	Yashtimadhu	*Glycyrrhiza glabra*	70 mg
	Shunthi	*Zingiber officinale*	125
	Vasa	*Adhatodavasica*	85 mg
	Pipalli	*Piper Longum*	150 mg
	Maricha	*Piper Nigra*	125 mg
	TankanaBhasma	*Borax*	75 mg
	Vacha	*Acorus calamus*	50 mg
	Sharkara	*Sacrum offcinarum*	120 mg

RESULTS AND DISCUSSION

Out of 98 patients, who have started Kovi-19 formulation in February 2020, 85 patients continued the therapy till April 2020. Of these 43 are females and 42 males. Mean age of the patients are 40.4 year. 43 individuals are in high risk group like diabetes (n=8), chronic hypertension (n=10), age above 60 (n=14), chronic respiratory disease (n=9), chronic kidney disease (n=1) and chronic liver disease (n=1). At the time of enrolment, 10 patients have low grade fever and mild respiratory complaints like cough, sore throat and coryza. These patients have been also provided with same medication (Kovi-19) and followed up telephonically at daily interval. All these patients have recovered from these complaints in a median span of 4 days without any allopathic or additional Ayurveda medication. The latest telephonic follow-up of all the ongoing volunteers has been taken in between 20-23 April, 2020. Till this date, none of the participants have tested positive for COVID-19 infection or developed any symptoms of COVID-19 and all the medications are well tolerated by patients.

Body's immune response to COVID-19 infection plays a vital role in deciding the possibility of getting viral infection. A strong immune response by the host during the incubation period of the virus can prevent getting infection or reduce the viral load. The immune response also decides the prognosis of the disease once the patient gets infected. The probable reason for high mortality rate amongst the patients with comorbidities is also related to body's compromised immune response. Studies have demonstrated that in recovered SARS patients, the inactivated SARS-CoV elicits an antigen-specific recall cytotoxic T lymphocyte response in peripheral blood mononuclear cells. However, the patients with severe SARS or SARS-related deaths do not produces such response. This suggests that the high-risk patients fail to generate sufficient protective immunity to eliminate SARS-CoV. On other hand, the immune responses to this pathogen in critical or deceased patients actually exacerbated their illness [5]. The cytokine storm, as a result of immune response, is also known to lead severe inflammation in body, thereby increasing the risk of multi-organ failure. Also, it is shown that $CD3^+CD8^+$ T cells, but not $CD3^+CD4^+$ T cells, are tremendously reduced in circulation of deceased patients, when compared to either the total

survived population or sex, age, and comorbid illness-matched controls [6]. The above findings highlight that immune response not only plays an important role in deciding whether an individual will get infected by COVID-19, but also plays an important role in deciding the prognosis and outcome of disease. Hence, the therapeutic approach towards coronavirus disease should not only be limited to antiviral strategies but also should focus in boosting immunity.

Ayurveda herbs that are used in KOVI-19 have shown potent antiviral, immunomodulatory, antioxidants and anti-inflammatory properties which offer protection to vital organs. *Glycyrrhiza glabra* stimulates macrophages and, in turn, elevates and assists immune stimulation, inhibits virus growth and stops the replication in influenza virus. *Zingiber officinale* possesses potent antibacterial properties. It increases the levels of antioxidant enzymes, including superoxide dismutase and glutathione peroxidase, which may be beneficial in inflammatory reactions triggered by viral infections. TNF-*α*, reported as anti-influenza cytokine, has been reported to be present in *Zingiber officinale* [3]. *Adathoda vasica* is a well-known herb in Ayurveda, used in treatment of various respiratory illness. It exerts bronchodilator effect, relaxation of tracheal muscle, and has antioxidant properties. Besides this, it also has anti-influenza virus activity that can inhibit viral attachment and/or viral replication, and may be used as viral prophylaxis [7].

Even though the number of subjects are less in this study, however, it can be considered as preliminary evidence for the tolerability, safety and can be used as a prophylactic herbs, mentioned in Ayurveda. In view of the scarce literature or evidence available for this newly emerged pandemic, such findings can serve as a primary basis for carrying out further studies. The rate of spread of corona virus disease in Pune city is fast. The first two cases in Pune were detected on 3rd March 2020 and on 25th April it crossed 1000 mark [8]. Considering the fast spread of disease in the city and that half of the patients in the study were high risk individuals, we believe that our findings have significant importance. This warrants randomized controlled study in larger population. This will help to integrate Ayurveda therapies in prevention and management of coronavirus disease.

CONCLUSION

Since the evidence for treating COVID-19 infection are very limited, we suggest to exercise caution and not to consider these herbs as a panacea for offering protection or absolute cessation of symptoms. Ayurveda herbs that are used in KOVI-19 could be integrated with conventional care in prevention and management of coronavirus disease for achieving reduced risk, symptoms reduction, and faster recovery. The results from this study can serve as a primary basis for carrying out further studies and help in reducing the risk of COVID-19 infection by boosting our immunity.

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Conflict of Interest

The authors declare no conflict of interest.

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