Role of antioxidant herbs and Yoga practices in prevention of infectious diseases with special reference to Covid-19 pandemic

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ABSTRACT

Infectious diseases are the disorders caused by pathogenic organisms which are scary because most of us don’t have the sufficient knowledge about them. They are scarier because they can be dangerous and may lead to loss of life. We think about them only if we are health care workers or it happens to ourselves and our close ones. Immunity plays vital role in prevention of etiological mechanism of the formation of diseases. Significant role of free radicals in initiating as well as improving immunity to minimize the diseases is major point of focus behind utilization of Anti-oxidant and rejuvenation therapy. Ayurveda has mentioned similar principles under the heading of Rasayana. Present work is a review based on the previous published articles, recent updates regarding prevention of COVID-19 according to World Health Organization, Ayurveda aspect towards prevention of infectious diseases using antioxidant herbs and yoga practices. There are numerous antioxidant herbs and yoga Asanas but the specific mentioned seems to be more useful in developing immunity. The mentioned ayurvedic herbs may prove more useful in developing immunity.

INTRODUCTION

Infectious diseases are the disorders caused by pathogenic organisms which are scary because most of us don’t have sufficient knowledge about them. They are scarier because they can be dangerous and may lead to loss of life. We think about them only if we are health care workers or it happens to ourselves and our close ones. Many earlier studies which were conducted during epidemic outbreak showed that the people with high risk had equal chances of getting infected in a population (Rodríguez, 2001). Infection can be explained as a condition where pathogens survive and reproduce in the host’s tissues. However the appearance of symptoms depends on few factor’s such as immunity and the environment required for multiplication of pathogens. Therefore there may or may not be appearance of symptoms (WHO, 2020).

The term infectious disease manifest only when the pathogen causes considerable damage in the host cell and thereby lead to manifestation of particular symptoms (WHO, 2020). In case of Covid-19, the pathological process starts from entering virus into body through mucous membranes of nose, mouth, eyes followed by infecting healthy cell and then multiplication of the virus (WebMD, 2020). The various symptoms which are expressed can be diag-
nosed by using various laboratory and clinical examinations. Immunity plays a vital role in prevention of etio-pathological mechanism of the formation of diseases. Significant role of free radicals in initiating as well as improving immunity to minimize the diseases is a major point of focus behind utilization of Anti-oxidant and rejuvenation therapy (Sharma, 1983).

Granulocytes, macrophages and natural killer cells play a major role in immune response either by inhibiting the growth of pathogen or killing it. Researches have found that contain necessary phytoconstituents required for initiating the immune responses as well as production of phagocytes and killer cells (Sainis et al., 1997). These finding indicate that Indian traditional medicines are rich source of immunomodulators and thus highly beneficial for strengthening host defenses and thereby fight against different diseases (Thatte and Dahanukar, 1986). Majority of Rasayana herbs i.e. immunomodulators are in fact strong antioxidant and rejuvenator having attributes which can delay ageing and enhance memory (Nariya et al., 2009).

Ancient seers of Indian civilization have discovered, propagated and followed specific exercises which have significant impact on physical as well as psychological functioning of body. These exercises are known as Yoga and have become increasingly popular in western civilization. (Sengupta, 2012; Mamtani and Mamtani, 2005). Therefore it can be interpreted that combination of Rasayana herb along with regular practice of selected Yoga exercises can be a natural way to boost immunity.

**Symptoms of COVID 19**

In most of the diagnosed cases the symptoms include fever in more than 90% cases, malaise and dry cough in 80% cases, shortness of breath in 20% cases and respiratory distress in 15% cases (Hui et al., 2020).
MATERIALS AND METHODS

Present review was done based on the previous published articles, recent updates regarding prevention of COVID-19 according to World Health Organization, Ayurveda aspect towards prevention of infectious diseases using antioxidant herbs and yoga practices with special reference to COVID-19. Information was collected from Google scholar, Pub Med, WebMD, YouTube Research gate. *Ayurved* Antioxidant and rejuvenating which play role as antioxidants and *Yoga Asanas* which help in development of immunity may prove useful for the current review on the prevention of infectious diseases like COVID-19.

Observations and Results

*Asanas* are the specific postures which help the body muscles as well as internal organs to get some stress and exercise. Regular practice of this stress and exercise makes the related organ stronger. The most common Yoga which can be practiced at home on daily basis includes Sukhasana (Figure 1), Pranayama (Figure 2), Kurmasana (Figure 3), Bhujangasana (Figure 4) And Ustrasana (Figure 5). In case of lungs, most Yoga exercises involves specific pattern of breathing which leads to increase in blood flow as well as increasing the elasticity of bronchial. Conditions such as common colds as well as flu are related with infecting bronchial pathway and bronchial organs. Therefore it can be claimed that Yoga practices such as Pranayama (systematic and sequential practice of breathing) helps to maintain normal physiological functioning and thereby provide resistance against various pathogens. According to study conducted by Kraftsow, most respiratory conditions in which symptoms such as common cold, flu, allergic condition as well as asthma are strongly related to weakness or impairment in immune responses which is again related with inappropriate or shallow habit of breathing *(Kraftsow, 1999).* In Yoga science, Kapalbhati is a special physiological exercise in which rapid and forceful breathing is performed through utilization of contraction and relaxation of abdominal muscles. In this practice abdominal organs, lungs and nostrils are involved which increases their strength and thereby resistance capacity *(Angela, 2007).* The brief benefit all Yoga procedures is depicted in Table 1.

Ayurvedic Antioxidants Herbs

**Aswagandha**

*Botanical name:* *Withania somnifera*

The role of *Withania somnifera* as immune modulator has been studied by using root extract. The experimental study conducted in mice revealed that *W. somnifera* helps in enhancing total WBC (white blood cell). The extract of *W. somnifera* is also found to have additional action of inhibiting delayed type of hypersensitivity reactions. In comparison to control group, this drug also showed improved phagocytic activity of macrophages *(Davis and Kuttan, 2007).*

**Guduchi**

*Botanical name:* *Tinospora cordifolia*

Guduchi (*Tinospora cordifolia* [Wild.] Miers.) of family Menispermaceae is an Ayurvedic drug used for Rasayan Chikitsa *(Acharya, 2001).* It has many medicinal properties which helps in curing symptoms and illness such as inflammation, diabetes, malaria, arthritis, stress and allergy. It also have anti-oxidant, hepatoprotective as well as immunomodulatory activities *(Mishra et al., 2013).*

**Haridra**

*Botanical name:* *Curcuma longa*

Turmeric is one of the regular ingredient of Indian diet. Ancient seers of Ayurveda were well aware of therapeutic potential of turmeric and thus they have clearly indicated the use of turmeric for blood purification, in inflammatory condition of liver, in allergic conditions as well as in reducing hyperlipidemia. Action of turmeric such as blood purifier, hepatoprotective and anti-cholesteremic action, it helps in lowering blood cholesterol as well as low density lipo protein. In such way turmeric act as cardio protective. In view of vital organ protecting attribute along with immunomodulatory and anticoagulant activity, turmeric can be said as one of the beneficial drug in all kinds of infectious conditions *(Chan et al., 2006; Dogne et al., 2006).* In addition, turmeric also possess antioxidant *(Vajragupta, 2003)* and free radicals scavenger activity *(Ruby et al., 1995).*

**Sunthi**

*Botanical name:* *Zinziber officinalis*

Sunthi (*Zinziber officinale Rosc.*) has anti-inflammatory activity. It has been found to have significant action against both gram positive and gram negative bacterial strain. The antirhinovirus activity of *Sunthi* was studied and well established by using plaque reduction test. Rhinovirus is common cause for cold and *Sunthi* contains beta sesquiphellondrene which inhibits growth and spread of rhinovirus *(Pitambar and Pimpalkhare, 2016).*

**Garlic**

*Botanical name:* *Allium sativum*

It is a well known drug which possess strong antioxidant, anti-viral and expectorant actions. These
Table 1: Asanas and their benefits as mentioned in various texts

| S.No | Asana               | Benefits                                                                 |
|------|---------------------|--------------------------------------------------------------------------|
| 1    | Sukhasana and Pranayama | reduce stress hormones, heart rate, and nervous system distress (which all supports strong immunity) |
| 2    | Kurmasana           | Supports the thymus which is responsible for immunity                    |
| 3    | Bhujangasana        | Open chest and prevent pneumonia                                          |
| 4    | Ustrasana           | Prevents bronchial congestion                                             |

actions have broad applications in prevention and management of various infectious diseases (Dausch and Nixon, 1990).

**Tulsi**

**Botanical name:** *Oscimum sanctum*

*O. sanctum* is a medicinal herb which acts as neurine tonic as well as memory enhancer. The volatile oil present in leaves and bark of *O. sanctum* have anti microbial action against air borne infection specially in condition such as catarrh (Sampath et al., 2010). A powerful antioxidant, Polyphenol Rosmarinic acid found in *O. sanctum* chemical act as rejuvenator and immunomodulator. According to research conducted by Chatterjee et al *O. sanctum* protects against Swine flu (H1N1flu) as well as help in boosting recovery of an affected person (Chatterjee, 2001).

**RESULTS AND DISCUSSION**

Multiple factors are responsible for the prevention of diseases, some of them can be easily controlled to halt the spread of infectious disease. Such ways includes applying restrictions on sources of infection, blocking the routes of transmission and treating high risk population. In cancer like diseases it can be prevented by chelation therapy. In case of Covid-19 a viral disease causing respirator+5ry problems leading to complete lock down of various countries and people are restricted to stay at home. The safety measures implemented like the Anti-oxidant and rejuvenating therapy and practising yoga may prove useful in developing immunity.

*Yoga* is well known for its effect on stress management (Kirkwood, 2005), however recent studies have proven that brief relaxation done during *Yoga* exercises has normalizing effect on ANS (Autonomic nervous system) by deviating both sympathetic and parasympathetic indices toward more “normal” middle region of the reference values. The effect of yoga modality can be further improved by intake of *Rasayana* herbs or by food items which are rich source of antioxidants. This strategy increases probability of prevention of disease (Ohlsson and Bengtsson, 2002). Antioxidants also have important role in preventive stimulation performed by plant foods (Yadav et al., 2016; Willett, 2011; Liyana-Pathirana et al., 2006). For systematic functioning of immune system, several minerals such as selenium, Zink, Manganese, Potassium etc are required and plants possessing anti-oxidant potential are rich source of such minerals. Mineral such as selenium has another additional benefit of antiviral activity. (Wójtowicz et al., 2004; Huang et al., 2012). Special influences on inflammatory actions are among other important events known for selenoproteins. The novel corona virus affects mostly old age and low immune persons. Thus the concept of immunomodulation by practicing *Yoga* along with proper use of *Rasayana* herb may prove an important implementable strategy for preventing infectious diseases like Covid-19.

**CONCLUSIONS**

This review suggests that mind-bodily exercise like yoga and anti oxidant herbs which help in improving immunity and delays ageing process, which is beneficial for the older age group people and helps in prevention of various infectious disorders like Covid-19 a viral disease. This modality of ayurvedic herbs and yoga practices modality may prove useful on future and further studies are required for the further implementation of the modality and healthy practices, the various Anti-oxidant and rejuvenatings consumption may prove useful to develop immunity. There are numerous antioxidant herbs and yoga Asanas but the specific mentioned seems to be more useful in developing immunity.

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