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Review Article

Ayurvedic Medicines as Immunity Boosting Measure During Covid -19 Crisis

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ABSTRACT

In the wake of the COVID-19 outbreak, entire mankind across the globe is suffering. Enhancing the body's natural defence system (immunity) plays an important role in maintaining optimum health. We all know that prevention is better than cure. While there is no medicine for COVID-19 as of now, it will be good to take preventive measures which boost our immunity in these times. The present communication deals with the detailed study of medicinal plants used for enhancement of immunity during the outbreak.

Keywords: COVID-19, Immunomodulators, Herbal medicine, medicinal plants

Introduction

Corona virus disease (COVID-19) is an infectious disease caused by a newly discovered corona virus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness, fever and recover without requiring special treatment. Older people and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease and cancer are more likely to develop serious illness due to this virus. Corona viruses (CoVs) belong to the family *Coronaviridae* and are enveloped, single-stranded, positive-sense RNA viruses (Ghosh et al. 2007). The CoVs are distributed in mammals as well as in humans causing mild infections. However, the severe acute respiratory syndrome CoV (SARS-CoV) and the Middle East respiratory syndrome CoV (MERS-CoV) from zoonotic sources in 2002 and 2012, respectively which were responsible for high infection and mortality rates (Zhao et al. 2003).

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A novel CoV named as SARS-CoV-2, causative agent of the CoV disease 2019 (COVID-19), has caused 750,890 confirmed cases globally with 36,405 reported mortalities (Anonymous, 2020). In the wake of the COVID-19 outbreak, entire mankind across the globe is suffering. Enhancing the body's natural defence system (immunity) plays an important role in maintaining optimum health (Gautam et al. 2020). We all know that prevention is better than cure. While there is no medicine for COVID-19 as of now, it will be good to take preventive measures which boost our immunity in these times. The present communication deals with the detailed study of medicinal plants used for enhancement of immunity during the outbreak.

Immunity

The term immunity defines body's natural defence system against a vast array of diseases and disorders.

Remarkably sophisticated and advanced among vertebrates, the complex immune system is capable to generate a limitless variety of cells and molecules to arrest enormous spectrum of infections and undesirable substances. Immunomodulators refer to those substances capable of inducing, amplifying, and inhibiting any component or phase of the immune system. Immunostimulators and immunosuppressant are two types of immunomodulators are known for use. In fact, immunopharmacology is a newer branch of pharmacology concerned with immunomodulators (Patil et al. 2012). Administration of immunostimulators as in the case of AIDS and use of immunosuppressor in cases of an exaggerated response of an immune system is appreciating to reconstitute the normal immune system and increase the longevity of life. Immunomodulator intake along with antigen, the process is meant to boost the immune system, and the modulator is known as immune adjuvant (Dutt, 2013).

Around 122 chemicals derived from plant sources have been identified as therapeutic substances which are also used as commercial herbal drugs, for example, bark of willow tree is very rich in salicylic acid, which is also an active metabolite of aspirin and it has been used from ancient times as a pain killer and antipyretic substance. Some of the drugs which are frequently used by the physicians are also derived from plant sources, for example, aspirin, digoxin, quinine and opium etc (Dias et al. 2012). Presently, there is much growing interest to use these medicinal plants as modulators of the complex immune system. Through a number of researches conducted in the area have been explored that many of the chemicals in the form of alkaloids, flavonoids, terpenoids, polysaccharides, (Wadood et al. 2013) lactones, and glycoside products are responsible to cause alterations in the immunomodulatory properties (Wadood et al. 2013).

Herbal medicines as immune-boosting Agent

1. Ashwagandha

In Ayurvedic medicines Ashwagandha holds a place similar to Ginseng in traditional Chinese medicinal therapies. It is also called the "Indian Ginseng." It has been used for thousands of years as a popular remedy in Ayurvedic systems for many conditions. Ashvagandha consists of dried mature roots of *Withania somnifera* Dunal. (Fam. Solanaceae), a perennial shrub, found in waste land, cultivated field and open grounds throughout India, widely cultivated in certain areas of Madhya Pradesh and Rajasthan, roots collected in winter, washed and cut into short pieces.

Chemical Constituent: Alkaloids and withanoloids

Doses: 3-6 g of the drug in powder form

2. Giloy (Guduchi)

Guduchi consists of dried, matured pieces of stem of *Tinospora cordifolia* (Willd.) Miers. (Fam, Menispermaceae), a perennial climber found throughout Tropical India, drug collected during summer preferably in the month of May, drug is used in fresh form also. Guduchi is a rich source of natural vitamin C and effective in inhibiting the growth of bacteria and in building up the immune resistance and has immune-boosting ability. Use of this plant increases white blood cells the killing ability of macrophages, the immune cells responsible for fighting invaders

Chemical Constituent: Terpenoids and alkaloids.

Doses: 3-6 g of the drug in powder form or 20-30 g of the drug for decoction.

3. Tulsi

Tulsi consists of dried leaf of *Ocimum sanctum* Linn. (Fam. Lamiaceae), an erect, 30-60 cm high, much branched annual herb, found throughout the country. It is a holy herbs among Hindus.

Chemical Constituent: Essential Oil (Carvacrol, Caryophyllene, Nerol and Camphene etc.)

Doses: 2-3 g. of the drug in powder form.

4. Haridra (Turmeric)

Haridra, consists of the dried and cured rhizomes of *Curcuma longa* Linn. (Fam. Zingiberaceae), a perennial herb extensively cultivated in all parts of the country, crop is harvested after 9-10 months when lower leaves turn yellow rhizomes carefully dug up withhand-picks between October-April and cured by boiling and dried.

Chemical Constituent: Essential oil and a coloring matter (curcumin).

Doses: 1-3 g of the drug in powder form.

In Ayurveda, the medicinal properties of turmeric the golden spice are used for strengthening the overall energy of the body, relieving gas, dispelling worms, improving digestion, regulating menstruation, dissolving gallstones, relieving arthritis, treatment for respiratory conditions, anorexia, rheumatism, diabetic wounds, runny nose, cough and sinusitis etc.

5. Dhanyaka (Coriender)

Dhanyaka consists of dried ripe fruits of *Coriandrum sativum* Linn. (Fam. Umbelliferae), a slender, glabrous, branched, annual herb, cultivated all over India, 30-90 cm high, giving characteristic aroma when rubbed, crop matures in 2-3 months after sowing, herb is pulled out with roots, after drying, fruits threashed out and dried in sun, winnowed, and stored in bags. Coriander is used for digestion problems including upset stomach, loss of appetite, hernia, nausea, diarrhea, bowel spasms, and intestinal gas. It is also used to treat measles, hemorrhoids, toothaches, worms, and joint pain, as well as infections caused by bacteria and fungus.

Chemical Constituent: Essential oil (Corendrol)

Doses:1-3 g of the drug in powder form

6. Lasuna (Garlic)

Lasuna consists of bulb of *Allium sativum* Linn. (Fam. Liliaceae); a perennial bulbous plant, cultivated as an important condiment crop in the country. It is nourishing (balya), improves eye vision, ignites the digestive fire, acts as a heart tonic, brain tonic, aphrodisiac, rejuvenator and antimicrobial. It purifies the blood, improves complexion (varnya), aids in healing of fractures, balances Vata and Kapha dosha but increases Pitta dosha.

Chemical Constituent: Volatile Oil containing Allyl Disulphide and Diallyl Disulphide. It also contains Allin, Allicin, Mucilage and Albumin.

Doses: 3 g of the drug.

7. Black pepper

Black pepper is a flowering vine in the family Piperaceae, botanically equated to Piper *nigrum* cultivated for its fruit, known as a peppercorn, which is usually dried and used as a spice and seasoning. When fresh and fully mature, the fruit is about 5 mm in diameter and dark red, and contains a single seed, like all drupes. It is one of the most important spices which is widely used to amplify the body's ability to absorb nutrients contained in the food and aid the digestive process.

Chemical Constituent: Piperine is under study for its potential to increase absorption of selenium, vitamin B12, beta-carotene and curcumin.

Doses: 3g of the drug

8. Nimba (Neem)

Nimba (Leaf) consists of dried leaf of *Azadirachta indica A. Juss* Syn. *Melia azadirachta* Linn. (Fam. Meliaceae); a moderate sized to fairly large evergreen tree, attaining a height of 12-15 m with stout trunk and spreading branches, occurring throughout the country up to an elevation of 900 m. It has strong health alleviating activity, used as a tonic and astringent that promotes healing. The extract has

antispasmodic action. Its usage in Ayurvedic medicine for thousands of years has proved its detoxifying properties. It has shown most beneficial effects for the circulatory, digestive, respiratory, and urinary systems.

Chemical Constituent: Triterpenoids and Sterols.

Doses:1-3 g. of the drug in powder form or 10-20 ml of the drug for decoction.

9. Pippli

Pippal mula consists of dried, cut, stem pieces of *Piper longum* Linn. (Fam. Piperaceae); a slender, aromatic, creeping and perennial herb; native of the hotter parts of the country and found wild as well as cultivated extensively in Bengal and southern states. Pippali, is a powerful stimulant for both the digestive and the respiratory systems and has a rejuvenating effect on lungs. It plays an important role in release of metabolic heat energy. This effect is the result of increased thyroid hormone level in the body. *Pippali* a typical Ayurvedic complementary component whose benefit is to increase the bioavailability and enhance absorption of the other active ingredients.

Chemical Constituent: - Alkaloids (Piperine, Piperlongumine, Piperlonguminine etc), Essential Oils.

Doses: 0.5 - 1g. of the drug in powder form.

10. Hritiki

Haritiki is consists of the pericarp of mature fruits of *Terminalia chebula* Retz. (Fam. Combretaceae), a moderate sized or large tree found throughout India, chiefly in deciduous forests and areas of light rainfall, but occasionally also in slightly moist forests, upto about 1500 m elevation, throughout India, flowers appear from April, August and fruits ripen from October-January. It is a safe and effective purgative, expectorant, and tonic. It is an important ingredient of the classical Ayurvedic formulation "Triphala" which has a combination of three fruits. Tiphalpha is an important Ayurvedic medicine, which promotes health through successive steps of purification and detoxification. It is known to have strong antimutagenic activity, because of its very rich content vitamin C.

Chemical Constituent: Tannins, anthraquinones and polyphenolic compounds.

Doses: 3-6 g of the drug in powder form

11. Sunthi (Ginger)

Sunthi consists of dried rhizome of *Zingiber officinale* Roxb. (Fam. Zingiberaceae), widely cultivated in India, rhizomes dug in January-February, buds and roots removed, soaked overnight-in water, decorticated, and sometimes treated with lime and dried. It is considered an adjuvant in many Ayurvedic formulas in which it enhances absorption and prevents gastrointestinal side effects. It is a very common spice which is used in Ayurvedic medicine to improve digestion and to prevent nausea. These properties help bowel movements and relax the muscles which control the digestive system.

Chemical Constituent: Essential oil, pungent constituents (gingerol and shogaol), resinous matter and starch.

Doses:1-2 g of the drug in powder form.

12. Tvak (Cinnamon)

Tvak is the dried inner bark (devoid of cork and cortex) of the coppiced shoots of stem of *Cinnamomum zeylanicum* Blume. (Fam. Lauraceae), a moderate sized evergreen tree usually attaining a height of 6-7 .5 m, cultivated on the Western Ghats and adjoining hills, bark collected during April-July and October-December.

Chemical Constituent: Essential oil, tannin and mucilage.

Doses:1-3 g of the drug in powder form.

13. Ajwain

Ajwain consists of dried fruit of *Trachyspermum ammi* (Linn.) Sprague ex Turril Syn. *Carum copticum* Benth

& Hook. f. *Ptychotis ajwan* DC. (Fam. Umbelliferae), an annual, erect herb, upto 90 cm tall, cultivated almost throughout India, uprooted and thrashed for collecting the fruits.

Chemical Constituent: Essential oil and fixed oil.

Doses: 3-6 g of the drug in power form.

14. Yasti (mulethi)

Yasti consists of dried, unpeeled, stolon and root of *Glycyrrhiza glabra* Linn, (Fam. Leguminosae), a tall perennial herb, upto 2 m high found cultivated in Europe. Persia, Afghanistan and to little extent in some parts of India.

Chemical Constituent: Glycyrrhizin, glycyrrhizic acid, glycyrrhetinic acid, asparagine, sugars, resin

Doses: 2-4 g of the drug in powder form.

15. Amla (Amalki)

Amla or amalki consists of pericarp of dried mature fruits of *Emblica officinalis* Gaertn. Syn. *Phyllanthus emblica* Linn. (Fam. Euphorbiaceae); mostly collected in winter season after ripening and in Kashmir in summer, a small or medium sized tree, found both in natural state in mixed deciduous forests of the country ascending to 1300 m on hills; cultivated in gardens, homeyards or grown as a road side tree.

Chemical Constituent: Glycosides (calotropin)

Doses:1-3 g of the drug for decoction.

Conclusions

Many of the chemicals from the plant sources in the form of alkaloids, flavonoids, terpenoids, polysaccharides, lactones, and glycoside products are responsible to cause alterations in the immunomodulatory properties.

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