



The Covid-19 Pandemic, Preventive Approaches, Perspective

Reza Bozorgipour*

*Formerly, Member of Scientific Board, Seed and Plant Improvement Institute, Karaj Department of Plant Genetic Resources, AREEO, Iran

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ABSTRACT

The COVID-19 pandemic has caused lots of crises, losses, and damages to the people's livelihoods. Undoubtedly, vaccination is the most essential and urgent solution but this solely may not resolve the issue in long term. Since the uneven and partial distribution of approved vaccines further complicates the issue. Besides, none of the present vaccines confer cent percent immunity. Furthermore, there are concerns about the longevity and efficacy of these vaccines as the new variants may evade current vaccines. Moreover, there is a minority of people with allergic reactions to these vaccines, and the side effects of the present vaccines in the long term are not yet known. Indeed, a multilateral approach is required to manage this pandemic. The COVID-19 is primarily a respiratory disease. The establishment of reliable procedures for regular disinfection of the respiratory system may help restrain the pandemic. In this proposal piece, a condensed description of traditional approaches to respiratory infectious illnesses is provided. These may inspire the development of preventive packages to protect people fairly against this contagious disease.

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Introduction

Viruses are the most plentiful and prolific biological entities as intracellular parasites on the globe. They have had an inconceivable role in evolution of species including mankind. About 20 percent of human cancers are attributed to viruses. In general, viruses have short life cycles, large population size and high mutation rates, particularly so in RNA viruses. These factors help them to evolve swiftly and adapt to the new host conditions.

Coronaviridae family viruses cause respiratory illnesses such as common colds, SARS, MERS, and COVID-19. The common colds also known as nasopharyngitis, rhinopharyngitis, coryza are mainly upper respiratory infectious diseases. Over 200 types of cold viruses have been identified half of them are rhinoviruses. These illnesses (common colds) may last from few days to three weeks and resolved by the immunity system. Coronavirus disease (COVID-19) started in late 2019 in China and declared as pandemic by WHO in March 2020. Since its outbreak, has been ravaging throughout the world causing large number of morbidity and mortality. The behavior of the COVID-19 is different and deceitful indeed. Majority of infected people have no symptoms or mild symptoms but others could get worse and show symptoms of pneumonia. The infection is often underrated as it may show no signs or mild symptoms early stages. Subsequently, besides fever and coughs, more serious symptoms such as difficulty in breathing, chest pain or pressure, low blood pressure, loss of speech and movement, damages to kidneys, brain, hearth, and death occurs. After the initial stages of disease, damages and costs of treatments rise exponentially. When it reaches pneumonia-like stage it paralyzes and colonizes lungs own immune cells, macrophages and T cells (1). The problem is it is highly contagious and the asymptomatic majority are transmitters,

unconsciously. Furthermore, the behavior of new variants are inconsistent, and unprecedented.

In the old world countries there has been a tropism in packs or traditional communities in utilization of folk medicines with a long history of well over thousand year antiquity. Various combinations of dried herbs administrated orally by brewing, decoctions, inhaling evaporated steams and drinking the extracts. These medicines are superannuated as not getting attention deservedly. For instance, steam inhalation deep rooted, using herbal extracts, had long been regarded as principle constituent for prevention and treatment of respiratory diseases up to mid twenty century. Clearly, venerable practitioners in earlier times had no knowledge of viruses, bacteria and so on but had the perception of causative pathogens infecting respiratory system. Some of the plant species commonly advised by traditional practitioners for the respiratory related illnesses are presented below:

Thymus vulgaris, *Glycyrrhiza glabra*, *Perilla frutescence*, *Salvia officinalis*, *Adiantum capillus veneris*, *Zataria multiflora*, *Zingiber officinalis*, *Malva sylvestris*, *Salvia rosmarinus*, *Viola odorata*, *Astragalus membranaceus* roots, *Astragalus gummifer* tracaganth, *Salix alba*, *Origanum marjorana*, *Origanum vulgare*, *Mentha piperata*, *Hyssopus officinalis*, *Nigella sativa*, *Foeniculum vulgare*, *Myrrhus communis*, *Allium sativum*, *Allium cepa*, *cimamomum verum*, *Elettaria cardamomum*, *Echinaceae angustifolia*, *Ziziphus jujube*, *Syzygium aromaticum*, *Anthemis hyaline*, *Mentha pulegium*, *Lavendula angostifolia*, *Chamaemelum nobile*, *Althea officinalis*, *Papaver somniferum* opioids, *Eucalyptus globulus* essence, *Crocus sativus*, *Boswellia sarrata* resins, *Dorema ammoniacum* resins, *Malus orientalis* vinager, *Acorus calamus*, *Echinops cephalotes* echinope, *Trigonella foenum graecuom*, *Matricaria chamomilla*, *Linum usitatissimum*, *Curcuma longa*, *Taraxacum officinale*, *Salvia*

Tele:

E-mail address: r_bozorgi2007@yahoo.com

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mitiorrhiza, *Plantago major*, *Plantago lanceolata*, *Ziziphora sp*, *Trachyspermum sp*, *Piper nigrum*, *Stachys lavendulfolia*, *Camelia sinensis*.

Most of these plant's species are now well known for their *anti-inflammatory*, antioxidant, antimicrobial and antiseptic effects. Many of these plants extracts are lung cleansers and anticoagulants such as thyme, garlic, green tea, cinnamon, chamomile, licorice, turmeric which are being used. Steam inhalation with diluted herbal distillates is more conveniently effectuated. Concentration of essential oils in herbal hydrosols is normally less than 1 percent. For example, lavender hydrosol used to treat sore throat, cough, nasal congestion and prevent blood clots formation administrated orally or through inhalation. Marjoram is used to treat anosmia. Both simple and composite types of inhalation with a variety of herbal extracts are used, further details are beyond the scope of this paper piece. A few of them are discussed briefly here. Their main use of these remedies is boosting the immune system and therapeutic effect comes next.

Thymus vulgaris with the highest antioxidant concentration in any plant, has been acclaimed as a general health enhancer for thousands of years. The antiseptic and antibiotic properties of thyme has been used for treatment of respiratory ailments. It helps relieving *inflammation* and as an expectorant helps eliminating sputum and mucus in the respiratory tract. Recently, initial report of a clinical trial revealed that COVID-19 patients showed significantly reduced fever, dizziness, cough, dyspnea, muscular pain, anorexia and chest pain after a week taking thyme syrup three times per day (2). Prior to that, a clinical trial conducted in 2016 showed inhaling thyme at 1% concentration effectively reduced wheezing and respiratory rate in patients with AECOPD (Acute Exacerbation of Chronic Obstructive Pulmonary Disease) (3).

Glycyrrhiza glabra roots, an old traditional Chinese herb widely used as medicine. It has been prescribed for cleaning of respiratory tract, cough, dyspnea, hoarseness and ulcers (4,5,6,). However, prolonged and excessive use of this plant roots were discouraged (4,5,6,). At present time, it is renowned for its immunomodulatory, *anti-inflammatory*, antiviral effects (7). Brewed licorice roots recommended traditionally for relieving inflammation of the bronchial mucosa and removing sputum. Earlier studies confirmed its effectiveness for treating SARS-CoV disease and now its potential as prophylactic and therapeutic uses for COVID-19 is advocated (8, 9).

Astragalus membranaceus/ Huang- Qi roots, one of the most popular herbal remedies in Chinese traditional medicine. Its regular consumption believed to prevent and treat diseases including respiratory infections from cold to flu. Accumulating research evidence suggest immune boosting and immune regulating effects of this herb. It induces T-cell activation leading to inhibition of pro-inflammatory cytokine (10,11). In China Astragalus roots extract through decoction often taken with ginseng. This herb is also advocated for a variety of other ailments.

Viola odorata, Violet oil is useful for relieving some of the painful symptoms of colds such as sore throat and sinus obstruction. This oil also has expectorant properties and helps to relax the mucus and sputum of the nose and respiratory system, which is useful for relieving congestion, obstruction and allows the air flow to move freely in the airways (12). Violets extract has been found effective to treat asthma, tuberculosis and a good remedy for inflammation of

respiratory tract (13,14). Steam inhalation of violet oil has long been used to treat cough, runny nose and inflammation of respiratory system. As for COVID-19 infection, some authors advocate its use as prophylactic measure and its relative therapeutic effectiveness at early stage of the disease (15)

Elettaria cardamomun has been used in Ayurvedic medicine in India, South East Asia and Middle East since primeval times. Its *anti-inflammatory*, antioxidant and antiseptic values are well recognized today (16,17). It has bronchodilatory effect hence used for the treatment of asthma (16). As natural expectorant helps soothing the mucus membrane It is recommended for treating sore throat, blood clots, cold, dyspnea, oral health and kidney disorders. It promote Oxygen uptake by enhancing blood circulation (18).

Allium sativum native to India, has been used primarily for its medicinal values in old world major civilizations. Hippocrates, the ancient Greek's physician used to prescribe it to cure a variety of health problems. Garlic has been used to treat respiratory diseases such as colds, flu, tuberculosis, and bronchitis. Modern science has recently confirmed many of its health benefits. A large number of studies supports *anti-inflammatory*, antiviral and antibiotic effects of garlic. Notable, The variety and the region of cultivation affects its quality and medicinal values. Allicin, an organosulfur compound in garlic acts as natural expectorant breaking down the phlegm. This can help to cure respiratory infections causing breathlessness and congestion, relieving asthma and reducing the risk of lung cancer. The antiviral properties of garlic along with clinical data for a wide range of viruses have thoroughly been reviewed (19) also being proposed as prophylactic remedy against invasion of COVID-19 into the human body (20).

A promising research report by German scientists at the University of Dussenberg has shown that *Salvia officinalis* and *Perilla frutescens* aqueous infusions had antiviral effect for the treatment of COVID-19 .The research team found that the aqueous infusion of sage and perilla elicited potent inhibitory activity against COVID-19 virus after just half an hour treatment on different human cell lines. Although results are *in vitro* condition they are encouraging to perform clinical trials to find out the *in vivo* efficacy (21, 22).

Having mentioned all these herbal medicines and the benefits, self- medication never recommended. It must be under supervision of health experts or qualified practitioners as there may be contraindications, medical background interactions, allergies and other complications For instance, garlic may cause headache, raise body temperature and skin irritations in some people.

Sum up

As yet, there is no specific terminative drug nor efficient treatment for the COVID-19 pandemic publically available. Currently, a large number of *in vitro* and *in vivo* research programs are being carried out for the pandemic all around the world. Undoubtedly, vaccination is the most essential and urgent solution, but this alone may not resolve the issue in long term as the more aggressive variants are emerging swiftly. Moreover, the present rate of supply cannot meet the global demand. Uneven and partial distribution of approved vaccines further complicate the issue. Furthermore, none of the present vaccine confer cent percent immunity. Besides, there are minority of people with allergic reactions to the vaccines, and side effects of the present vaccines in long term are not yet known. In low income countries, in spite of implementing health care protocols and restrictions, the virus

is spreading at amazing rate due to poor health care systems and insufficient vaccination.

The health care authorities and pharmaceutical firms should also consider alternative strategies besides vaccination as preventive measures. In fact, a multilateral approach required to degrade virus population on global scale and restrain the pandemic. The protective packages/measures must be developed to act as deterrents precluding the disease development. The desired objective should be **decontamination/disinfection of respiratory system on regular basis**. The initiative procedures should be affordable and accessible. Apart from the COVID-19, there are other respiratory illnesses including pneumonias (viral, bacterial, fungal), tuberculosis, flu which are preventable upon **regular disinfection of respiratory system**. Indeed, the traditional medicines are not in contrast nor incompatible with modern medicine. Clearly, old medicines are not as precise and organized as modern medicines. But, they can be regarded as basic approach and merged into modern medicine as these are heritage of hundreds of generations. New technologies along with advances in modern sciences can help developing the protective packages. The folk medicines should be verified and optimized to meet the present needs. They can be used as templates for use in modern medicine. This approach may inspire the development of preventive package to protect people fairly against this transmissible hazardous disease and other respiratory illnesses. Innovative procedures to decontaminate the respiratory system will satisfy a long felt need.

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