

POSSIBLE ROLE OF MEDICINAL PLANTS IN COVID19 - A BRIEF REVIEW

Dr. Atul Desai¹, Dr. Chirag Desai², Dr. Hemshree Desai³, Anjuman Mansuri⁴, Jital Desai⁵

¹Dhanvantari Clinic, Ayurveda Health Care and Research Center, Vyara, Gujarat, India.

²HOD, Department of Pharmacology, Smt.B N B. Swaminarayan Pharmacy College, Salvav, Vapi, Gujarat, India.

³MBBS; ATBU Harita Pharmaceuticals Pvt. Ltd. Vyara, Gujarat, India.

^{4,5}B.Pharm, Smt. B N B. Swaminarayan Pharmacy College, Salvav, Vapi, Gujarat, India.

Abstract: Currently entire world is under the threat and suffering from the infectious disease known as COVID19. Recently world health organization also accepted that viral diseases are serious health issue for the world. Within this time line various literatures published on epidemiology and pathophysiology which suggest its major and largest single strand RNA virus damaging the respiratory system in humans. No therapeutic options available to cure the infection in till date which increases the mortality rate across the countries. Currently there is no antiviral treatments have been approved, several approaches have been proposed such as lopinavir / ritonavir, chloroquine and hydroxychloroquine. India is a hub for traditional alternative system of medicine and therefore possibility to find solution to fight against Covid19 is obviously possible amongst the sources. The current review emphasize on various medicinal plants having potential to be considered as part of formulation or used safely in prevention and management of infectious disease. The information collected from data source available on internet, correlation with bronchial activity and ACE enzyme, antioxidant, immunomodulator activity, cardio tonic and most importantly it executes antiviral and antimicrobial activity that are scrutinized and discussed. Major emphasize given on onion, garlic, ginger, neem, pineapple, kiwi, papaya, pomegranate, piper longum, myrobalan, guduchi, shatavari, jaiphal, jivanti, peppermint. The current situation demand proper herbal drug utilization to prepare the population immunity to fight against the infection. The review will help the entire population to refresh their faith and knowledge regarding traditional medicines.

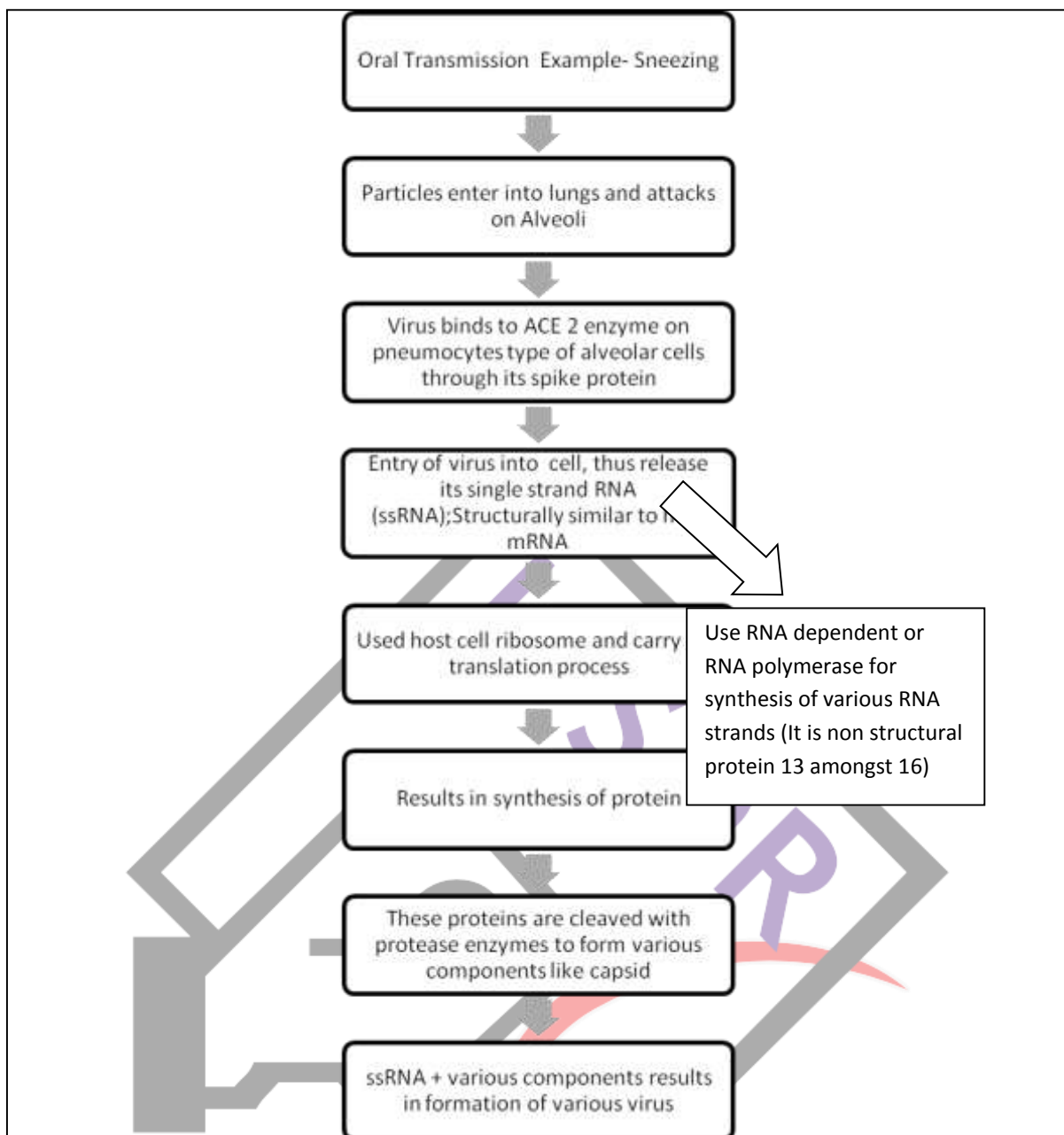
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Corresponding author: Dr. Atul Desai

Introduction: Currently entire world is suffering from the Covid19 infection which has forced many countries to follow lockdown procedure to ensure safety of their nationalist. During this time every government is engaging their research teams to overcome the problems created by the infection covid19. During this critical time period the information provides on importance of utilization of some medicinal plants being at home how it will be more fruitful is more important. As we all know now that covid19 has become largest known single stranded RNA virus which damages the respiratory system in human. ^[1]

Pathophysiology of covid19: The virus is enveloped and single stranded positive RNA type of virus. The review suggested that they involved in the synthesis of polyprotein1a/1b in host ^[1] pathophysiology of Covid19 also links the function of non structural proteins in viral activity in host cell. The virus enters into host having characteristics receptors recognized by virus spike protein. After entry into the host cell there are 16 nonstructural proteins like RNA dependent RNA polymerase, non structural protein-12. ^[2] This is vital for generating full length virus RNA. ^[1] The non structural proteins have function like suppression mRNA of host cell which might be the role of suppress immune response of host. The attempt has been made to prepare and explain pathogenesis via flowchart in figure 1. For COVID19 the receptor in human was identified as Angiotensin-Converting Enzyme 2. ^[1-2]

The pathogenesis suggests that virus affect ACE2 site. The effect of virus cause cells normal function to get disturbed. The enzyme is zinc containing enzyme working for cleaving angiotensin 2 into angiotensin 1, cleavage of bradykinin, dynorphin A and ghrelin. In case of considering the site of viral entry the cleavage function is disturbed for ACE2. This will lead to increase bradykinin. The literature also suggest bradykinin cause dry cough. Bradykinin is also known as chemical mediator causes increase capillary permeability and smooth muscle contraction, so it will cause edema in lungs and disturbed gas exchange function in alveoli. No doubt other chemical mediators and inflammatory cells will also travel to the target site. ^[3]



[Figure 1: Schematic representation of pathogenesis of corona virus entry in humans.¹⁻² the above mention schematic presentation was surely based on explanation mentioned in references for better understanding about the infection in human.]

Current management options: Currently there is no permanent cure or vaccine available for this infection. Oxygen supplementation, mechanical ventilation is currently major instrumental management measures. There are no supportive medications like corticosteroids or antibiotics are advocated. Currently, approaches like combination drugs containing lopinavir/ritonavir generally anti-retroviral drugs 400mg /100 mg every 12 hours, chloroquine which is anti-malarial 500 mg every 12 hours, hydroxychloroquine anti malarial 200 mg every 12 hours. Alpha-interferon also a proposed approaches used.

How routine use of some traditional medicinal plants proposed to fight against Covid19:

Onion/ *Allium cepa*: Most important raw food served in salad famous for its flavor and taste. Previous study mentioned quercetin; isorhamnetin can reduce blood pressure and prevent angiotensin-II-induced endothelial dysfunction. The subsequent increased superoxide production resulted in a high nitric oxide bioavailability.^[4] Onion is rich source for viral chemicals flavanoids, organo sulfur compounds having potential antioxidant activity. Onions also contains fructans which help to fight against bacteria.^[5] Various studies on onion found it contains potential antiviral activity even against respiratory viruses too.^[6,7] The efficacy in respiratory viral infection by onion can be effectively used by nebulization or inhalation may improvise the antiviral potential of drug. Flavanoids have chelating property so it might be consider for targeting the various motifs in virus cell structure.^[8] The another advantage of onion is even type diabetic patients can also consume it without any hesitation as its also having ant diabetic activity.^[9] Onions also consider to consist proline which is theoretically responsible for stimulating proinflammatory cytokines, and consider to provide antiviral effect against certain virus types.^[10]

Pineapple/ *Ananas comosus*: Commonly consumed fruit known as *Ananas Comosus*, the pineapple plant. Bromelain is a general name for a family of sulphhydryl proteolytic enzymes obtained from stem or fruit. Its proteolytic activity is rapidly inactivated as part of homeostasis in plasma.^[11, 12] Bromelain possess antiplatelet and anti inflammatory activity as well as it also possess activity to decrease substance P and edema.^[13-15] This will indicate that if someone exposes to surgery the use need to be restricted. Some populations also exhibit allergy to pineapple so caution must be monitor during initial dosing. Bromelain also have tendency to decrease bradykinin.^[16] Bromelain is also potent anticancer and immunomodulators.^[17]

Neem/ *Azadirachta Indicia*: It is most commonly used medicinal plants in cosmetic and herbal industries. Neem is most common medicinal aid in villages as well as used in many religious purpose too. Many people in India use onion and neem leaves because it is mosquito repellent and anti microbial property keeps the home safe and hygienic. Many people believe neem leaves also provide fresh oxygen though hanging Toran. Previous literature studies have already mentioned that neem have antimicrobial, anti-inflammatory, antifungal, antipyretics, immune-stimulant effect.^[18-21]

Pomegranate/ *Punica Grantum*: The fruit of pomegranate used extensively in various clinical conditions for management and control. It contains flavanoids and anthocyanidin. The pomegranate also exert metal chelating activity.^[22-23] Pomegranate also found therapeutics benefit in anemia, colic, acute dermatitis, oral diseases, acne and many others.^[24] It is the traditional solution for fertility in males since many years.^[25] The active ingredients improvise the antioxidant activity of cells like red blood corpuscles and its resistance power against oxidative cells.^[26] Pomegranate also have observed effect to reduce angiotensin converting enzyme.^[27]

Bitter Gourd/ *Karela/ Momordica charantia*: It is the one of the vegetable of India. It is delighted to cook with cashew or onion in marriage functions in winter seasons mainly. Bitter gourd is famous medicinal plant for its anthelmintic and antimalarial action. Bitter gourd has been reported to contain many potent protein which inhibit several viruses like Dengue virus, Herpes virus, hepatitis B virus and Human Immunodeficiency Virus.^[28-32]

Haritaki/ *Terminalia Chebula*: It is more popular medicinal plant with highest phenolic content amongst all plants.^[33] It is one of the components of popular Triphala formulation. Haritaki have proven anti-histaminic activity.^[34] Haritaki also possess cardio protection by lysosomal membrane stabilization activity,^[35-37] antiviral activity,^[38] The plant have nerve tonic potential too.^[39] Its phenolic content potential to inhibit sialic acid might be source to consider for anti viral activity.^[40]

Long Pepper/ *Piper longum*: Most important spice and bioavailability enhancer herbal medicine.^[41] Piper is effective in asthma and potential to modulate immune response.^[42] Piperine act as a stimulant by antagonizing respiratory depression,^[43] that might help in overcome the breathing difficulty issue in respiratory problems. Its combination with black pepper and ginger helps to prevent various Respiratory and liver problems.^[44]

Garlic/ *Allium Sativum*: Allicin is main active constituent of garlic. It is one of the popular herbal medicines for cardio vascular disease and its prevention.^[45] Garlic also possesses antimicrobial activity. Approximate 4g per day is recommended dose for adults are advised.^[46]

Guduchi/ *Tinospora cordifolia*: It is consider as drug which can improve body resistance power. An Indian tribal population is using this since years as its every part have some vital health benefits. Its chemical constituents help to fight against virus through preventing fusion or adsorption. The drug is mentioned as “Rasayana” in Ayurveda, indicated that it is having vital therapeutic potential.^[46-49]

Nutmeg/ *Myristica fragrans*: It is commonly popular as spice to add flavor in many sweet dishes. Even in jam, chutney and juices also found one of the ingredient fruit of nutmeg.^[50] Its chemical composition like tocopherol, ascorbic acid, flavanoids, phenolic compounds helps in providing natural antioxidant activity.^[51] The spice found ultimate place in many herbal formulations for its therapeutic potentials.^[52, 53]

Discussion: In this article the purpose is to correlate how inability of ACE2 to metabolize some important chemicals in humans can create untoward effects produces sign and symptoms. The medicinal plants discussed here might be already use by many of us based on our affordability. Time being utilization of these herbs definitely improve immunity and helps to fight against various health related issues. Even though they are traditional medicinal source, it does not necessitate that inappropriate use of them boost up immunity towards health problems. Combinations containing proper herbs in a formulations and adequate amount of dose for its consumption are better advised. Proper patient education regarding the health benefit of using traditional medicinal plants in routine practice is more require. Proper selection of combination of herbs for activity study against current viral infection may help to prepare the healthcare to prepare against any health related issues. Utilization of convenient and safer drug delivery options like herbal immunity providing inhaler, herbal tonic mukhvas, herbal proactive lozenges, herbal drug patches become area of interest for current situation but demands proper knowledge and care. For earning all such commercial and healthcare benefits from medicinal plants we need to conserve our green environment and sustain its resources.

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