

Role of some herbal dietary supplements in the management of covid-19 treatment

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Abstract - A new coronavirus (SARS-CoV-2) infection has caused the current outbreak of severe respiratory syndrome (called COVID-19). The World Health Organization (WHO) designated this infectious disease as a pandemic because it poses a global hazard to public health and lives. Many governments have recently imposed limitations in order to locate infected individuals, isolate them, and try to develop effective treatments to help reduce the disease's severe symptoms. Regardless of the measures made, the number of coronavirus illnesses reported continues to rise. Despite the fact that numerous research and drug businesses are still developing treatments, no medication or vaccine has been approved to protect and treat patients who are infected with this coronavirus. This review tries to outline the herbs and plants that could be used as natural herbal therapy in conjunction with western medicine to help cure or protect people from COVID-19. Different plants contain compounds such as andrographolide, quercetin, baicalin, curcumin, glycyrrhizic acid, emodin, patchouli alcohol, luteolin, and myricetin, which have been found to be effective health remedies. Understanding the laws of infection, elucidating the pathogenic mechanisms, and detecting the proper drug treatment could help in the creation of important treatment and prevention approaches

keywords - SARS-COV-2,Herbal drug therapy, Nutraceuticals

INTRODUCTION:

In December 2019, the coronavirus was discovered for the first time in Wuhan (China's People's Republic). It causes a severe acute respiratory ailment that has swept the globe, prompting the World Health Organization (WHO) to declare a pandemic on March 11, 2020. The virus is a member of the Coronaviridae family, subfamily Coronavirinae, which affects animals and mammals. The United States of America, India, Brazil, Russia, France, the United Kingdom, and Turkey reported the most instances, with the number of infected people and deaths varied daily by continents, regions, and countries.

This virus is spread through aerosol drops that infect the afflicted person's nose, mouth, and eyes. Fever, tiredness, dry cough, illness, dyspnea, headache, sore throat, and other COVID-19 clinical symptoms are common, with pneumonia being the most common manifestation of infection. The medical distal continuum of SARS-CoV-2 can range from asymptomatic individuals to serious pneumonia resulting in acute respiratory distress syndrome, which can lead to multi-organ failure (MOF), and this infectious disease is still changing and spreading over the world. Dyspnea and hypoxemia are the primary symptoms in some patients, which can progress to a moderate respiratory condition requiring oxygen treatment⁽¹⁾.

The key strategies available to halt the prevalence and severity of the disease and the inflammation it causes are preventive therapy and strategy, self-defense, early diagnosis, and exclusion. After been studied for efficacy, protection, and dosage verification, several vaccinations and medicines are already being used to treat COVID-19.

However, the pandemic continues, with the fourth wave intensifying and it seems like the pandemic will never stop. As a result, new COVID-19 treatments can be devised by examining the use/reuse of a wide range of naturally occurring active chemicals.

SARS-COV VIRAL ENTRY MECHANISM AND IMMUNE RESPONSE FROM A VARIETY OF PERSPECTIVES:

The Middle East Respiratory Disease coronavirus (MERS-CoV) and SARS-CoV are human coronaviruses. Members of the genus that preceded the SARS-CoV-2 include two very different SARS-CoVs and MERS-CoVs. Other human coronaviruses include 229E and NL63 from the family, as well as OC43 and HKU1 from the genus. The RNA of this new SARS-CoV-2 virus is 30 kilometres long, which is the same length as the RNA of the SARS-CoV and MERS-CoV viruses that caused issues many years ago. The genomic sequences of this novel virus and a recognised bat coronavirus and SARS-CoV are 96 percent and 79.5 percent similar, respectively.

According to another investigation, when compared to a recognised bat coronavirus and SARSCoV, this virus shares a genome-sequence resemblance of around 45 percent to 90 percent with SARS-CoV, but only about 20 percent to 60 percent with MERS-CoV. The gene sequences for SARS-CoV-2 are shorter. MERS-CoV, on the other hand, has a longer sequence. The S protein of SARS-CoV-2, as well as SARS-CoV, binds to the human zinc peptidase ACE2, which is expressed on a range of cells, including lung, heart, kidney, and intestinal cells, and so triggers viral entry into target cells. There are two techniques to target the ACE2 receptor depicted⁽²⁾.

CHARACTERISTICS OF SARS-COV-2:

Coronaviruses have pleomorphic envelopes that are circular or oval. The coronavirus has a genomic length of 30,000 nucleotides and a diameter of 50–200 nm. This novel coronavirus has four structural proteins encoded. Spike (S), membrane (M), envelope (E), and nucleocapsid (N) are the proteins, and the capsid is a protein shell that includes nuclear capsid, or N-protein, which is linked to the virus's single positive strand RNA and allows it to hijack human cells and turn them into viral factories.

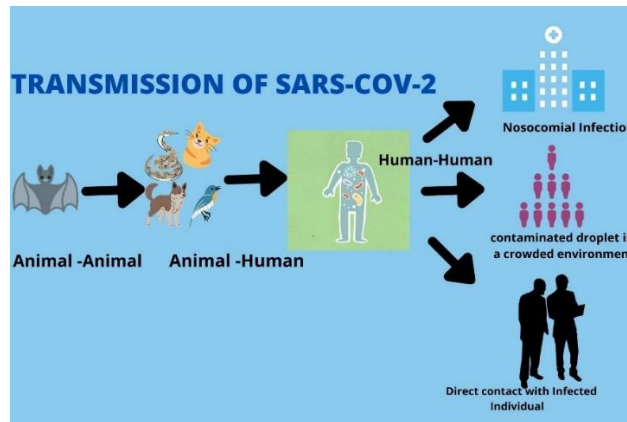
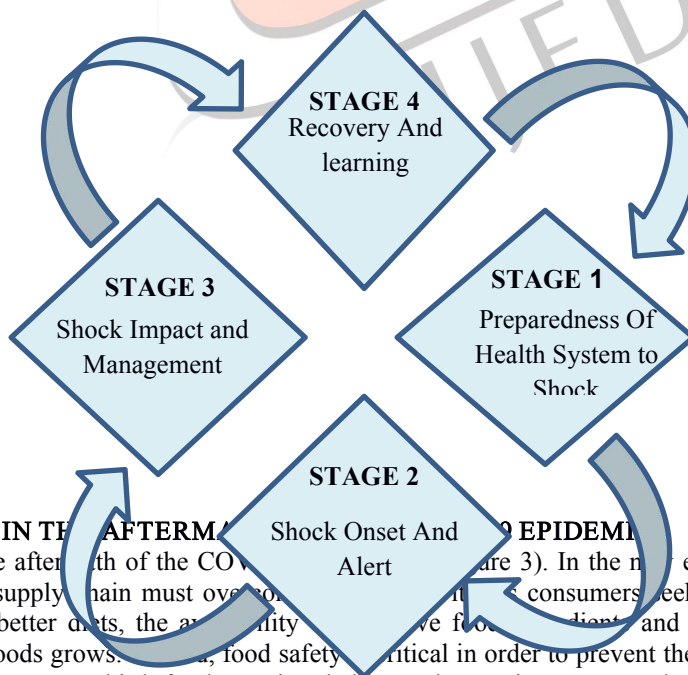


fig no: 1 Transmission of SARS-COV-2

The N protein is required for replication and transcription and covers the viral RNA genome. The N protein's N-terminal binds to genomic and sub-genomic RNAs in MHV and IBV virions and conducts viral replication and transcription. The M-protein is found in the highest concentration on the viral surface and is thought to be the coronavirus's core organizer. Coronavirus is infectious and can be spread through inhalation or direct touch. Virus droplets inhaled as a result of coughing and sneezing (a single sneeze can produce up to 10,000 droplets) as well as contact with a contaminated surface remain in the air in very small droplet form as seen in Figure 1 are the most common causes of infection⁽³⁾.

STAGES OF COVID-19:

The AIFA study on medicine consumption during the COVID-19 outbreak, as well as the ClinicalTrials.gov analysis, provide compelling evidence of the clinical utility of the drug repurposing method in the COVID-19 timeframe. A considerable increase in the usage of azithromycin, hydroxychloroquine, tocilizumab, and darunavir/cobicistat (all well-known drugs used for different illnesses) was recorded in Italy in March and May 2020, compared to the preceding three months. Furthermore, as of November 23, 2020, 3987 trials involving COVID-19 had been filed on ClinicalTrials.gov, the majority of which were looking at "old" drugs that had been repurposed for this unique illness. Figure 2 shows a summary of repurposed medicines for COVID-19 management based on the severity of the disease and their present position in therapy⁽⁴⁾.



FOOD SYSTEMS IN THE AFTERMATH OF THE COVID-19 PANDEMIC (partially obscured). Food systems in the aftermath of the COVID-19 pandemic (Figure 3). In the near future, there are four major concerns that the food business and supply chain must overcome. First, consumers seek to defend themselves and their immune systems by eating better diets, the availability of organic, natural, and functional foods may become crucial, as demand for these goods grows. Second, food safety is critical in order to prevent the virus from spreading between producers, merchants, and consumers. Third, food security is a result of a billion people being confined to their homes. Last but not least, the sector should consider the long-term viability of food systems in the face of pandemics in order to limit future disasters⁽⁵⁾.

fig no: 2 STAGES OF COVID-19

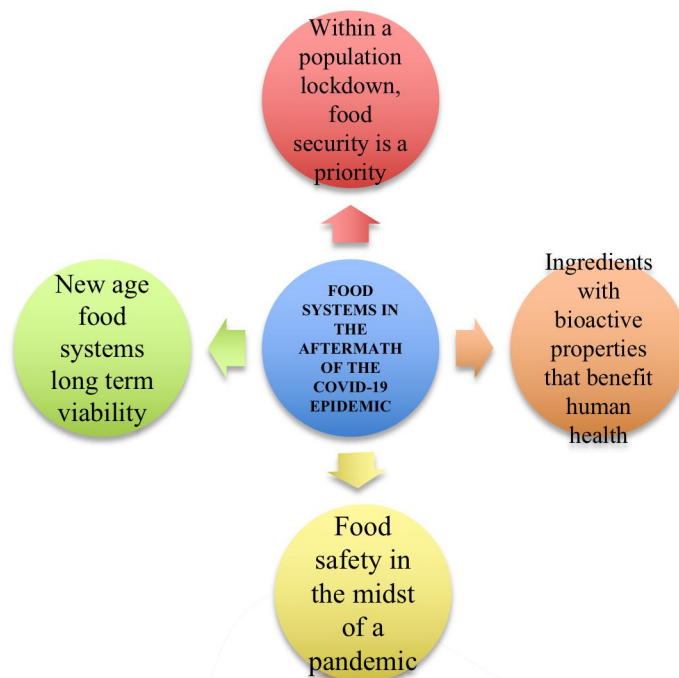


Fig. no 3 **FOOD SYSTEM IN THE AFTERMATH OF THE COVID-19 EPIDEMIC**

Food bioactives and nutraceuticals have been offered as an alternative treatment to COVID-19 disease, based primarily on their anti-inflammatory qualities, but also on their potential to impede virus activity (e.g., SARS-CoV, MERS-CoV, and SARS-CoV-2) by disrupting their protein envelopes. These chemicals, for example, can boost type 1 interferon's response to RNA viruses like influenza and coronaviruses.

INFORMATION ON DIETARY SUPPLEMENTS:

The first section of the survey asked on the use of DSs(Dietary supplements). We characterized them in this study as any product that contains concentrated concentrations of vitamins, minerals, fatty acids, probiotics, or other bioactive components and herbs and allows exact dosing. We also inquired about the use of bioactive substances, herbs, and pro-health foods such as ginger, garlic, elderberry, turmeric, Nigella sativa, and other similar plants. We investigated vitamins, minerals, fatty acids, bioactive substances, and herbs taken with DSs based on data regarding trade names of preparations provided by subjects and information gathered from internet shops and pharmacies⁽⁶⁾.

During the second wave of the pandemic, we also questioned respondents if they changed their consumption of herbs or foods typically associated with the immune system, as well as the reasons for their decisions.

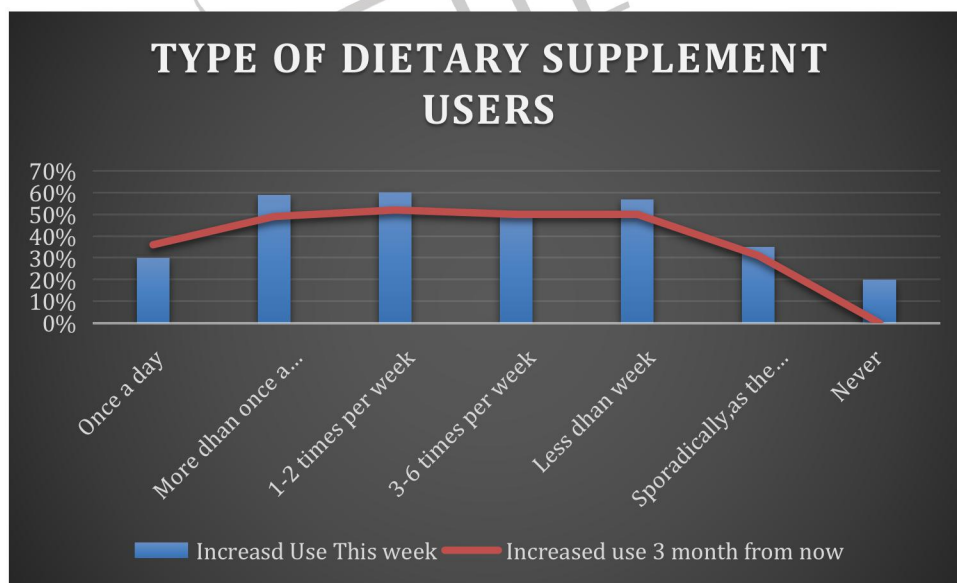


fig no : 4 TYPES OF DIETARY SUPPLEMENTS USER

TARGETING COVID-19 WITH A NUTRACEUTICAL OR SUPPLEMENT: Nutraceuticals is a combination of the words "nutrient" and "pharmaceutical." A highly nutritious dietary component or food item is referred to as a nutrient, whereas a pharmaceutical is a medical medicine. Nutraceuticals are a type of biological therapy that is used to treat cancers that are exceedingly harmful yet have mild symptoms. Since the start of the 2019 COVID-19 illness outbreak of corona infectious disease, several healthcare authorities have provided compassionate use permissions. Apart from ramdevsivir, which showed promising results and was approved by the Food and Drug Administration (FDA) for use in the treatment of COVID-19, no apparent antimicrobial medicine has been found to be effective.

According to these reviews and findings, nutraceuticals, which include nutritional supplements, derived nutrients, dietary and herbal products, have physiological benefits that may play a significant role in reversing inflammatory cataract sensitivity and hypercoagulation by prescribing anti-inflammatory and antioxidant medications. Vitamins C and E, carotenoids, certain elements (such as Zn, Mn, Cu, and Se), and polyphenols such as flavonoids, phenolic acids, stilbenes, and lignans work together to maintain an effective redox (oxidation-reduction) balance, providing therapeutic or health benefits. In general, a polyphenol-rich diet is beneficial for reducing and preventing cardiovascular disease.

Plant secondary metabolites (e.g., -carboline, quinoline alkaloids like cinchonine, skimmianine, dictamine, and quinine, as well as isoquinoline alkaloids like emetine, berberine, and sanguinarine) can act as DNA intercalators, inhibiting virus replication (similar to chloroquine's proposed in vitro mechanisms of action against SARS-CoV-2). Angiotensin-converting enzyme 2 binding is another anti-replication mechanism (ACE-2)⁽⁷⁾.

HERBAL MEDICINE THERAPY IN CHINESE TRADITION:

Traditional Chinese Medicine (TCM) has been used to prevent, treat, and cure disease as well as promote health since 200 AD. TCM had been the primary treatment for most diseases in Chinese communities prior to the entrance of Western medicine in the 19th century. Despite the fact that the United States has become the epicenter of COVID-19 cases, the epidemic began in China's Wuhan region.

Practitioners in China adopted a unique medical guideline for disease management during the early stages of the pandemic, which integrated TCM and Western medicine. According to the Chinese government, 91.5 percent of COVID-19 cases were successfully treated with a combination of Western therapy and TCM. Many TCM plants have inherent toxicity, which is often mitigated by various processing processes. TCM is used by millions of individuals around the world, but only a small percentage of them have major side effects. Most TCM customers face the issue of confirming that the product they are consuming has been properly processed and is devoid of hazardous components and impurities. When the herbs are not managed by qualified TCM practitioners, this might become a big issue⁽⁹⁾.

A comprehensive evaluation released in June 2020 discovered that the government has established traditional medicine guidelines for COVID-19.5 treatment. The Chinese government issued some of these rules, while the Korean government issued others. There were recommendations for mild, moderate, severe, and recovery stages of the condition in these guidelines. If not handled and processed properly, several herbs listed in these instructions can be extremely poisonous.

HERBS AND SPICES WITH ANTIVIRAL ACTIVITY:

1)HERBS:

a)OREGANO:

Lippia graveolens, a species of Mexican oregano, is native to Central America and Mexico. Mexican oregano is a therapeutic herb, and it was discovered that when its essential oil was extracted, it contained a chemical called Carvacrol. Carvacrol is a component in Mexican oregano essential oil. Several studies have demonstrated antiviral activity. The human respiratory syncytial virus (HRSV) was discovered to be the leading cause of bronchitis and pneumonia in children and the elderly. Ribavirin is a medicine that can be used to treat this virus, although it is not suitable for youngsters. Plant extracts like carvacrol appeared to be beneficial against viruses like HRSV⁽¹⁰⁾.

Carvacrol is an active chemical that plays a function in diseases caused by RNA and DNA viruses. Carvacrol is an essential oil that has been shown to protect against virus infection.

(b)BASIL:

Tulsi (*Ocimum sanctum* Linn.) basil is a traditional and religiously significant herb. Tulsi is a plant that is revered. Tulsi leaf, consumed first thing in the morning on an empty stomach, has been shown to enhance immunity. Many experiments have been conducted with the ethanolic extract removed and the effects seen, demonstrating the efficiency of the holy plant leaves in increasing immunity. Tulsi extracts have been shown to have antiviral properties. Tulsi extracts were found to inhibit the activities of herpes viruses, hepatitis B, and enterovirus in a test tube investigation. As a result, even eating 3-5 Tulsi leaves daily can boost immunity while also benefiting from the antiviral qualities of Tulsi Plant leaves⁽¹¹⁾.

(c)ASHWAGANDHA:

Ashwagandha, technically known as *Withania somnifera*, is a powerful plant used in Ayurveda for a range of ailments. "Smell of the Horse" is how Ashwagandha is translated from Sanskrit. The "Indian Ginseng" is another name for Ashwagandha. It is a member of the Solanaceae family and is found throughout the Indian subcontinent. Ashwagandha is frequently used in the Ayurvedic medicine system to treat inflammation, arthritis, tumours, hypertension, and asthma. According to research, Ashwagandha increases the synthesis of antibodies. These antibodies consume the poisons and subsequently excrete them in the form of perspiration, mucus, faeces, and urine from the human body⁽¹²⁾.

2)SPICES:

(a)GINGER:

Ginger, *Zingiber Officinale* Roscoe, is a spice popular in India and other countries for its culinary and therapeutic benefits. Because of the presence of beneficial plant chemicals, ginger has great antiviral capabilities and can be used to treat respiratory disorders. Gingerol, together with other sulphur-containing chemicals (allicin, alliin, and ajoene) and enzymes, is the pungent active component present in Ginger (allinase, peroxidase, and myrosinase). Ginger contains compounds that boost antioxidant activity in the body, such as superoxide dismutase and glutathione peroxidase, which helps to fight viral infections⁽¹³⁾.

(b) CUMIN:

Cumin's name comes from the Latin word 'cuminum.' Jiira, Afedziiraa, Safedjiiraa, and zeera are some of the names used in India. Cuminumcyminum has been studied for insecticidal, antimicrobial, analgesic, anti-inflammatory, anticancer, antioxidant, antiplatelet aggregation, antidiabetic, bronchodilatory, hypotensive, contraceptive, immunological, anti-osteoporotic, anti-amyloidogenic, alpha glucosidase, aldose reductase, and tyrosinase inhibitory Cumin can help with a variety of digestive problems by strengthening the gastrointestinal tract and relieving nausea, bloating, and constipation. Cumin has been used to treat jaundice, hoarseness, dyspepsia, and diarrhoea for centuries.

(c) CAPSAICIN:L

The most essential component of spicy peppers is capsaicin (chilli peppers). It is a member of the Solanaceae family and belongs to the genus *Capsicum*. Capsaicin has a number of beneficial benefits on the gastrointestinal and cardiovascular systems. Many health problems, such as heart disease, cancer, and neurological illnesses like Alzheimer's, can be avoided by removing free radicals. When the cause isn't smoking or allergy, capsaicin is known to ease symptoms like stuffy nose, sneezing, postnasal drip, and congestion. The COVID-19 exhibits flu-like symptoms, and capsaicin has been shown to be beneficial in treating cold and flu-like symptoms. Capsaicin helps to relieve nasal obstruction and nasal hyperactivity and relieves respiratory problems like colds and congestion⁽¹⁴⁾.

STATISTICAL ANALYSIS:

SPSS 22.0 statistical package software was used to analyse the data in this study. The qualitative data was compared using 2 analysis, and the results were summarised using descriptive statistics. Using logistic regression analysis, the impacts of several independent variables (gender, age, career year, obesity, and disease) on the consumption of functional foods and herbal medications were investigated. For model fit, the Hosmer–Lemeshow test was used. For all statistical studies, the level of significance was set at P 0.05.

The participants in the current study had an average age of 306 911 years, and the majority of them (882%) were women. The participants' average BMI was 224.436 kg/m², and almost three out of every four dietitians had normal BMI levels. The bulk of the participants (607% and 465%, respectively) had a bachelor's degree and worked in government entities. According to the participants' responses, 820 percent of them did not have any chronic disorders, and nearly half of those who did (485) had endocrine system diseases⁽¹⁵⁾. Despite the fact that 396 percent of dietitians had been diagnosed with vitamin-mineral deficiency by a doctor, 872 percent of them utilised vitamin-mineral supplements to cure it.

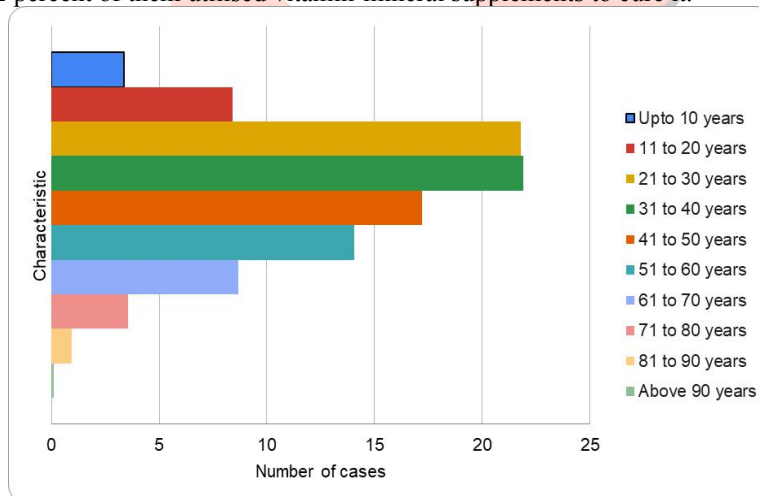


fig no : 5 NUMBER OF THE CORONAVIRUS (COVID-19) CASES IN INDIA

CONCLUSION :

COVID-19 posed a significant threat to global health and safety. It became critical for governments, hospitals, researchers, businesses, and even individuals to gather information and control the pandemic breakout so that the fatality rate might be reduced as much as possible. Because the virus's precise mechanism is still unknown, no specific medicine or vaccination has been created to date. Nonetheless, detecting and controlling the source of disease, breaking the chain of infection, and using available medications to reduce and treat the disease's symptoms are all critical. There is a need to focus efforts on developing specific treatments, moving forward with vaccine development, and implementing ways to reduce morbidity and mortality rates while also protecting people's lives. Nonetheless, detecting and controlling the source of disease, breaking the chain of infection, and using available medications to reduce and treat the disease's symptoms are all critical. There is a need to focus efforts on developing specialised drugs, moving forward with the development of a vaccine, implementing ways to reduce morbidity and mortality rates, and safeguarding people's lives. These monomers showed good binding ability with the SARS-CoV-2 virus and host targets in computer simulations and molecular docking, indicating that

they could block the viral-host binding sites. Traditional Chinese medicine herbs include numerous beneficial components, and their abundance, low price, and low toxicity suggest their usage as possible COVID-19 medicines.

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