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HERBAL MEDICINES: ACROSS SECTIONAL STUDY TO INVESTIGATE THE PREVALENCE AND PREDICTORS OF USE AMONG INDIAN CITIZENS AND THEIR THERAPEUTIC EFFECTIVENESS DURING THE COVID-19 PANDEMIC

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ABSTRACT
Herbal drugs are widely utilized in many nations, and they include leaves, fruits, barks, seeds, stems, flowers, roots, rhizomes, and bulbs. Many small and major illnesses can be prevented and treated with herbal remedies. This study aims to assess the prevalence and correlates of usage of herbal medications among Indian citizens through a cross-sectional analysis. The relevant data was gathered from 246 persons between March 11, 2022 and March 24, 2022, using a Google form. People most frequently utilized ginger, turmeric, tulsi , cloves, cinnamon, Giloy , and black pepper as natural remedies. Around 98% of participants stated that herbal medications were superior to commercially accessible allopathic drugs. Drugs made from herbal medicinal plants had reduced toxicity and better therapeutic effects during the COVID-19 pandemic. During the COVID-19 pandemic period, a survey of herbal medicinal plants of Indian origin was conducted. According to the survey's findings, the majority of Indian Ayurvedic practitioners reported that these medications had better therapeutic efficacy, minimal toxicity, and no negative side effects. These herbal medicinal plant parts, which are of Indian origin, have anti-oxidant, detoxifying, and respiratory-supporting properties.

KEYWORDS : *Turmeric, Clove, Survey, Anti Oxidant, Anti inflammatory, Therapeutic effectiveness & Toxicity.*

INTRODUCTION

A new coronavirus disease called COVID-19, commonly known as SARS-CoV-2, has been causing an acute respiratory sickness outbreak worldwide since December 2019. The World Health Organization declared a pandemic on March 11, 2020, due to the rapid spread of COVID-19. This pandemic was able to show a larger amount of deaths . Because of the wide range of symptoms, there are currently no particular treatment medications for this illness. Historically, herbal therapy has been a significant factor in the management of infectious disorders. The notion that herbal medicine has a positive impact on the treatment and prevention of epidemic diseases has been bolstered by the noteworthy outcomes of clinical evidence from several research on the use of herbal medicine in the treatment of SARS coronavirus (SARS-Co V) has produced noteworthy findings and bolstered the notion that herbal therapy might help cure and prevent pandemic diseases. Herbal treatment in conjunction with Western medicine may help SARS-Co V patients with their symptoms and quality of life, according to a Cochrane systematic review. Herbal medicine may also lower the likelihood of H1N1 influenza infection, according to a recent meta-analysis .Herbal therapy is regarded as one of the alternate methods for treating COVID-19 because it is based on prior experience. To date, there is a large body of clinical evidence demonstrating the benefits of using herbal therapy in the treatment of COVID-19. Several systematic reviews of evidence from case reports, case series, and observational studies were also undertaken to investigate the efficacy of herbal medicine in COVID-19 treatment. However, reviews of randomized control trials (RCTs) provide the highest degree of evidence in the hierarchy of systematic reviews.. Therefore, using only currently available RCTs, our goal in this study was to assess the efficacy and side effects of herbal medications in the treatment of COVID-19.

IMPORTANCE OF HERBS WITH THEIR THERAPEUTIC EFFECTIVENESS :

1. TURMERIC

It is useful in inhibiting the growth of germs, harmful microbes and bacteria. Turmeric is widely used as home remedy to heal cut and wound. Traditionally, it is used as anti-inflammatory. Turmeric and its most active compound, curcuminoids have many scientifically proven health benefits, such as the potential to improve cardiac activity and useful in the treatment of Alzheimer's disease and cancer. Turmeric (Curcuma longa) and its component, curcumin, have long been used for their therapeutic benefits. Turmeric and curcumin's anti-inflammatory, antinociceptive, and antioxidant properties may be responsible for the majority of their therapeutic effects. The current review summarizes the preventative and therapeutic potentials of turmeric and its key constituent, curcumin, on inflammatory illnesses and pain, as well as patents linked to their analgesic and anti-inflammatory properties, to emphasize their significance on human health. Turmeric has a variety of therapeutic applications, including treating Alzheimer's disease. Curcuminoids, a compound composed of curcumin, dimethoxy curcumin, and bisdemethoxycurcumin, are essential components of turmeric. Curcumin is often regarded as the most essential component of the curcuminoid combination, contributing to the pharmacological profile of the parent curcuminoid mixture or turmeric. A thorough review of the literature demonstrates that

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the other two components of the curcuminoid mixture also play an important role in the efficacy of curcuminoids in AD. As a result, this review emphasizes that each component of the curcuminoid mixture has a separate function in making the curcuminoid mixture effective in AD, and so the curcuminoid mixture better represents turmeric in terms of medicinal usefulness than curcumin alone. Alzheimer's disease is the most frequent type of dementia. There is little choice in modern therapies, and the drugs that are accessible have limited success, as well as numerous side effects, and are expensive. As a result, better and more effective therapy approaches for Alzheimer's disease are being investigated in search of safer therapeutic targets. Turmeric has various therapeutic purposes, including treatment for Alzheimer's disease.



Fig (1.1) TURMERIC

2. TULSI

Tulsi has excellent medicinal properties. Tulsi has also been demonstrated in studies to be useful at treating diabetes by lowering blood glucose levels. The same study found that Tulsi significantly reduced overall cholesterol levels. Another study found that Tulsi's favorable effect on blood glucose levels stems from its antioxidant qualities. The Rama Tulsi is an effective treatment for severe acute respiratory syndrome. The juice of its leaves provides relief from colds, fevers, bronchitis, and coughs. Tulsi oil is sometimes used as an eardrop. Tulsi can help cure malaria. It is highly useful against indigestion, headaches, hysteria, sleeplessness, and cholera. Every day, millions of individuals take fresh Tulsi leaves. For generations, Tulsi (the queen of herbs) . In this study, we attempted to summarize the various ethnomedicinal uses, phytochemicals, and pharmacological applications of various Ocimum species that have long been used in traditional medicine for a variety of therapeutic applications, including antibacterial, antioxidant, anti-inflammatory, wound healing, and other medicinal properties. Medicinal plants used to treat various maladies and diseases are the most abundant biological reservoirs of phytochemicals. Ocimum species differ in terIms of morphology, pharmacology, and natural bioactive chemicals



Fig (1.2)TULSI

3.GINGER

The ginger plant is a herbaceous flowering plant from the Zingiberaceae family. Zingiber officinale Roscoe is the scientific name for the perennial plant, which consists of a pseudo-stem, yellow flowers, and tuberous rhizomes, generally known as ginger root or ginger. The rhizomes of ginger plants are the most sought-after component due to their aromatic odor and spicy taste. Ginger is consequently a significant culinary component. Originally from Asia, the most popular traditional usage of ginger was as a flavoring

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agent in its different forms, which might include fresh, dried, pickled, powdered, and preserved; and, more interestingly, as a tonic root to treat many maladies for its medicinal properties.

Heart health is mostly linked to the crude extract and its associated strong active ingredients. Ginger's cardiotonic, anti-hypertensive, anti-hyper lipidemia, and anti-platelet properties all contribute to its cardioprotective benefits. Additionally explained are the molecular mechanisms and signal ing pathways involved in ginger's cardioprotective properties. Despite recent advances in the treatment of cardiovascular problems, CVDs continue to pose a medical challenge. Many traditional medications are used to protect the heart, but they have a number of negative effects. Given the rich phytochemistry and fewer adverse effects of herbal medicines, researchers have focused on developing novel herbal pharmaceuticals with cardioprotective properties. Ginger is a widely used and well-known functional food and condiment with numerous bioactivities, such as anti-inflammatory, antioxidant, and antibacterial characteristics, that aid in the treatment of a variety of illnesses.



Fig (1.3) GINGER

4. CLOVE

It helps with coughs and colds. It is useful for nausea. It reduces mouth ulcers. It promotes blood flow. Clove oil derived from clove buds serves as a local anesthetic . It promotes digestion and alleviates tension. Cloves are used for a variety of purposes, including culinary and medicinal. Clove is a versatile kitchen spice that can be used to season onions, tomatoes, salads, herbal teas, and soups. It adds taste to a variety of products, including meat, cookies, gum, spices, fruits, pickles, chocolates, soft drinks, puddings, sandwiches, pastries, and candy. Volatile oil is used to add fragrance to perfumes, soaps, toothpastes, and medications. In Indonesia, a particular cigarette known as "Kretek" is made by mixing clove with tobacco in a 1:2 ratio. Clove has antibacterial properties and is used in mouthwashes, dental creams, throat sprays, and toothpastes to fight germs.



Fig (1.4) CLOVE

5. NEEM

Leprosy, eye conditions, intestinal worms, stomach distress, appetite loss, heart and blood vessel illnesses, fever, diabetes, and liver issues are all treated with neem leaves. Azadiracta indica (Neem) is mostly utilized in complementary and alternative medicine, which includes homeopathy, ayurveda, and unani medicine. According to the unani system, it works well to improve the liver, enrich blood, and strengthen teeth and gums. Because it works as an anti-malarial, anti-fungal, anti-microbial, and anti-parasitic in a variety of animal species, it is well-known for its numerous health advantages. Consuming foods and herbs high in polyphenols and flavonoids can slow the progression of a number of chronic illnesses, such as diabetes, cancer, and cardiovascular diseases Anticancer Effect Neem, a versatile medicinal plant, has been used for centuries to give various health advantages. Cancer is the uncontrolled proliferation of cells that disrupts the body's natural activities. Cancer can be healed using neem leaf extract. A study used MNNG to develop mouth and stomach cancer in rats. Arivazhagan et al. (1999) found that administering neem leaf extract decreased tumor cell mitotic activity.

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Fig (1.5) NEEM

6. GARLIC

Another extensively researched garlic preparation is aged garlic extract. Sliced garlic that has been preserved in 15-20% ethanol for more than 1.5 years is referred to as aged garlic extract. This entire process is expected to result in a major loss of allicin and enhanced activity of certain newer molecules, such as S- allyl cysteine, sallyl mer capto cysteine , allixin, N-0 -(Ideoxy-D-fructose-1-yl)-L-arginine, and selenium, which are stable and considerably antioxidant. Garlic oil is primarily manufactured for medicinal purposes through the steam distillation technique. Steam-distilled garlic oil contains diallyl, allyl methyl, and dimethyl mono to hexa sulfides . Botanically, Allium sativum belongs to the Lillaceae family, which includes onions, chives, and shallots. Garlic and its preparations are well-known for their ability to prevent and treat cardiovascular problems. Research suggests that garlic consumption can lower blood pressure, prevent atherosclerosis, lower serum cholesterol and triglycerides, inhibit platelet aggregation, and increase fibrinolytic activity . Both experimental and clinical investigations on several garlic formulations show that they have beneficial cardiovascular benefits.



Fig (1.6) GARLIC

MATERIALS & METHODS

Herb Collection

The fresh garlic (Allium sativum) and clove (Syzygium aromaticum) utilized in this study were gathered from the neighborhood market and identified and verified by a botanist. After being twice cleaned with distilled water, the fresh herbs were chopped, let to air dry, and then ground into a powder using a pestle and mortar.

Aqueous Extract

Conical flasks were filled with five grams (5gm) of the powdered herbs and twenty milli liters of distilled water. A wooden cork was placed over the flasks, and the contents were well combined. Overnight, the flasks were kept in a shaker set to 100 rpm. After passing the mixtures through a muslin cloth and centrifuging them for five minutes at 2000 rpm, the supernatant was poured into a sterile falcon tube and refrigerated at 4°C.

Ethanolic Extract

To make the ethanolic extract, 20mL of 95% ethanol and 5g of powdered herbs were combined in a flask and corked. A similar process was used for the mixing, 24-hour shaking, and muslin cloth filtration. After five minutes of centrifugation at 2000 rpm, the supernatant was decanted. After discarding the particle, the supernatant was filtered and then concentrated using a rotary evaporator. After that, the extract was kept in a refrigerator at 4°C in a sterile falcon tube until it was needed again.

Extract Sterility Test

All extracts' sterility was assessed using nutrient agar. Nutrient agar plates were inoculated with 1 ml of each extract, and the plates were then incubated for 24 hours at 37°C. The contamination was checked by looking for bacterial growth. The extracts were sterile since there was no growth in the plates.

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Antimicrobial Susceptibility Testing

All of the bacterial isolates used in this investigation, including three gram negative (E. coli, Pseudomonas aeruginosa, Klebsiella pneumoniae) and two gram positive (Methicillin-resistant Staph aureus, Streptococcus spp.), were described in accordance with Singh et al. (2015).

Antimicrobial susceptibility testing was conducted using the agar well diffusion method in accordance with the standards set out by the Clinical and Laboratory Standard Institute (CLSI). Bacterial suspensions were made using a 0.5 McFarland comparison. Criteria and injected onto Oxoid Mueller-Hinton agar plates. Steel borer (12mm) was used to make wells on agar plate. The wells were filled with 0.1mL, 0.5mL and 1.0mL of each extract. Ciprofloxacin (10 µ g) was used as the positive control, while the central well served as the negative control.

Each dilution's sample was examined three times. Following a 24-hour incubation period at 37ºC, ZOI (Zone of Inhibition) measurements were made (Mukhtar and Ghori, 2012). The diameter of ZOI determines the extracts' antibacterial activity; a larger ZOI indicates a high level of activity, whereas a smaller or absent ZOI indicates no activity.

Clove and garlic extract minimum inhibitory concentration (MIC)

A modified version of the previously published broth dilution method by Eloff (1998) was used to determine the minimum inhibitory concentration (MIC) of clove and garlic. 50 u L of nutritional broth was added to each of the 12 wells on the microtitration plate. Next, 50 u L of extract was added from the first well to the tenth well using a two-fold serial dilution. After that, 20 u L of bacterial suspension (0.5 McFarland) was added to the 12th well. The 11th and 12th (nutrient broth+ extract) wells served as the positive and negative controls, respectively, and were cultured for 24 hours at 37ºC. The growth on nutrient agar plates was used to determine the results.

RESULTS

With the exception of K. pneumoniae, which it demonstrated mild antibacterial activity against (7.30±0.5mm, 8.70±0.5mm, and 9.00±1mm) at 01 mL, 0.5 mL, and 1.0 mL of 50 µg/mL, respectively, the ethanolic extract of garlic exhibited no antibacterial activity against any of the bacterial isolates, as illustrated in Fig. 1. According to the findings, garlic's aqueous extract exhibited no antibacterial action against any of the bacterial isolates at any concentration. The zone of inhibition produced by Table 1 lists the aqueous and ethanolic extracts of garlic.

According to the current investigation, clove ethanolic extracts had better antibacterial activity than aqueous extracts. Clove extracts shown antibacterial action against all bacterial species, with the maximum activity against MRSA (12±0.5 mm and 20±1 mm) and K. pneumoniae (12±0.5 mm, 18±1 mm, and 26±0.5 mm). As shown in Figures 2 and 3, the aqueous extract exhibited little bactericidal impact against MRSA and P. aeruginosa but superior antibacterial activity against K. pneumoniae (10±0.5 mm and 16±0.5 mm). Table 2 lists the zone of inhibition generated by clove aqueous and ethanolic extracts.

Table 1 lists the antimicrobial properties of ethanolic and aqueous extracts of garlic (Allium sativum) and cloves (Syzygium aromaticum).
The organism Zone of Inhibition and Concentration of Garlic Aqueous Extract 50µg/mL
The organism Concentration of garlic ethanolic extract and inhibition zone: 50 µg/mL
Control positive (Ciprofloxacin)
5 µg of 0.1Ml, 0.5Ml, 1.0Ml, 0.1Ml, 0.5Ml, 1.0ML
MRSA Resilient, resilient, resilient MRSA Resistant Resistant 23 mm of resistance
P. aeruginosa Resilient, resilient, resilient P. aeruginosa Resistant Resistant 20 mm of resistance
K. pneumoniae Resistant Resistant Defiant K. pneumoniae 8.70±0.5 mm 9.00±1 mm 20 mm 7.30±0.5 mm
S. pyogenes Resilient, resilient, resilient S. pyogenes Resistant Resistant 20 mm of resistance
E. Coli Resilient, resilient, resilient E. Coli Twenty millimeters of resistance

Table 2: Inhibition zones generated by clove aqueous and ethanolic extracts
The organism Zone of Inhibition and Clove Aqueous Extract Concentration (50µg/mL)
The organism Concentration of zone of inhibition and clove ethanolic extract (50µg/mL)
Control positive (Ciprofloxacin)
Five µg of 0.1 mL, 0.5 mL, and 1.0 mL
MRSA Resilient, resilient, resilient MRSA 12±0.5 mm, 20±1 mm, and 23 mm resistant
P. aeruginosa Resilient, resilient, resilient P. aeruginosa Defiant 20 mm, 10±1 mm resistant
K. pneumoniae 10±0.5 mm to 16±0.5 mm resistant K. pneumoniae 18±1 mm, 26±0.5 mm, 20 mm, and 12±0.5 mm
S. pyogenes Resistance S. pyogenes Resistant 11±0.5 mm 8±1 mm, 14±1 mm, and 20 mm resistant
Resistant E. Coli Resistant 8±1 mm E. Coli Ten to twenty millimeters of resistance

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OBJECTIVES

1) Providing current data on herbal drug trends among Indian citizens is the primary goal of this study.

2) To compile further data regarding the quality, safety, and effectiveness of conventional medications.

3) To raise the general public's level of knowledge and interest in therapeutic herbs.

4) To raise knowledge about the use of herbal medications as home cures.

5) To raise public understanding about herbal drugs' safety.

RESULT & CONCLUSION

The application of herbal remedies was the main emphasis of the project. In order to assess the prevalence and predictors of herbal medications among Indian citizens during the COVID-19 pandemic, this survey aims to conduct a cross-sectional investigation. The study showed a sectional analytical report regarding herbal medicinal plants and their therapeutic effectiveness during COVID-19 pandemic. The study and the approved above data shows and percentage of herbal remedies and their effects with minimal side effects and overcounting action against covid 19. Also about the various properties of the herbal medicines like anti microbial activity, anti oxidant, anti inflammatory action, with boosting immunity of body towards covid 19. Also some herbal medicines were used by Doctors which was very helpful to create awareness regarding the therapeutic effectiveness of herbal medicines during covid 19 pandemic. The above study shows a clear beneficial results towards use of herbal medicinal plants and herbal medicines during covid 19 outbreak. The below graphical diagrammatical data shows a clear vision regarding the use of herbal medicines during covid 19. Hence the cure rate of people in young age during covid 19 was a large use of herbal remedies on homemade basis. (It was about 56% cure rate estimated).

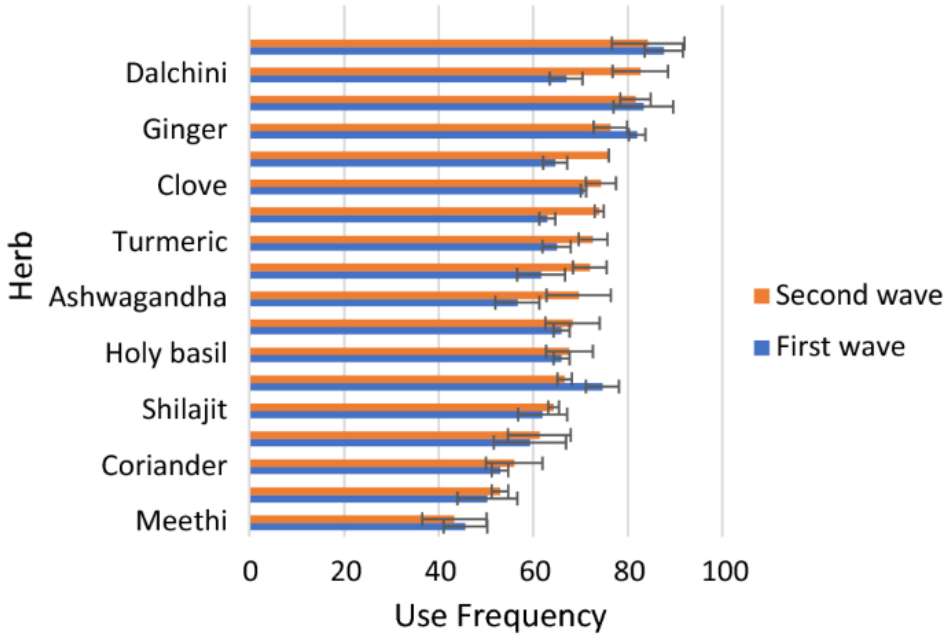


Fig (1.7) Analyzing the use of Medicinal Herbs During Covid 19

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