

Turmeric: A Medicinal Plant with Numerous Health Benefits

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Abstract: *Turmeric has carminative, stimulating, and fragrant properties that make it a moderate digestive. One of nature's most potent medicines is turmeric. Curcumin is the active component in turmeric. In India, where it was most likely first employed as a dye, turmeric has been used for over 2500 years. Over the ages, this spice's therapeutic qualities have gradually come to light. Although turmeric has long been known for its anti-inflammatory qualities, more recent studies have shown that it is a natural wonder that can help treat a wide range of illnesses, including cancer and Alzheimer's disease. In India, an antibacterial ointment based on the spice is utilized. Asian cosmetics like turmeric water are used to give the skin a golden sheen. Turmeric has been used externally for ulcers and inflammation and internally for ailments like liver blockage and jaundice in Unani medicine. A remedy for dysentery has included roasted turmeric as one of its ingredients. Tooth powder or paste has also been made with turmeric. In traditional medicine, turmeric has been used to treat a wide range of ailments in Bangladesh, Pakistan, and India. Generally speaking, the most utilized portion of the plant is the rhizome. It is said to relieve coughs and asthma and can be prepared in a number of ways. In Ayurvedic medicine, hot water extracts of the dried rhizome have been administered orally to lower inflammation. Another classification for turmeric is "rasayana," a category of plant used in Ayurvedic treatment*

Keywords: Curcumin, anti-inflammatory, anti-allergic, ayurveda

I. INTRODUCTION

Curcuma longa, popularly known as Turmeric, is a rhizomatous herbaceous perennial plant used in folk medicine for the treatment, prevention, and management of various illnesses such as cancer, diabetes, arthritis, diarrhea, inflammation, psoriasis, hepatobiliary diseases, gastric and peptic ulcers. Human being used plants parts as a phytomedicine since ancient times. Plants are important for bioactive constituents as primary and secondary compounds. It has been found that secondary metabolites both chemically and taxonomically are exceptionally different compound. This metabolite used in many areas like human therapy, agriculture, scientific research, veterinary and many other areas. They are largely used in the human therapy, agriculture, scientific research, veterinary and many other areas. According to the World Health Organization (WHO), about 80% of individuals from developed countries use the traditional medicine as a source of potential and powerful drugs that are derived from medicinal plants [1]. Curcuma longa is a perennial herb erect, leafy, belongs to the *Zingiberaceae* family, that measures up to 1 m high with a short stem, having oblong, pointed leaves and funnel-shaped yellow flowers. It is spread throughout tropical and subtropical regions of the world that are generally cultivated in Asiatic countries, mainly in India and China. 'Haldi' traditionally known in India whose rhizomes are oblong, ovate, pyriform and often short branched [2]. Current research shows that curcumin has a new magnitude about its potentiality and have anti-inflammatory and anticancer activities [5]. The yellow powder known as curcumin extracted from rhizome is used medicinally. Dried Curcuma longa which is the source of the spice turmeric gives curry powder whose colour is yellow. Turmeric used in traditional Indian medicine as well as Hindu religious ceremonies and also used widely in foods for its flavour and colour. The old Hindu texts have described that turmeric is as aromatic stimulant and carminative. Recently powder of turmeric used as

traditional medicine against gastrointestinal diseases, especially for biliary and hepatic disorder, diabetic wounds, rheumatism, inflammation, sinusitis, anorexia, coryza and cough. Turmeric which act as anticancer, anti-diabetic, anti-oxidant, hypolipidemic, anti-inflammatory, anti-microbial, anti-fertility, anti-venom, hepatoprotective, nephroprotective, anticoagulant and possess anti-HIV activity to combat AIDS [1].

II. DRUG PROFILE

Drug Name: Turmeric

Botanical Origin : - *Curcuma longa*
 Family : - *Zingiberaceae*
 Synonym : - Indian Saffron, Turmeric, Haldi, Haridra, Curcuma
 Biological Source : - Turmeric consists of dried as well as fresh rhizomes of the plant *Curcuma longa*.
 Activity : - Anti-inflammatory
 Chemical Constituent : - Curcuminoids: curcumin, demethoxy curcumin, bisdemethoxy curcumin, volatile oils, sugars, bitter substances, fixed oils and acids.
 Organoleptic Characters: -
 Colour : - Yellowish to yellowish brown
 Odour : - Aromatic and characteristics
 Taste : - Slightly bitter
 Size : - 2-3 cm in length and 1-1.5 cm in thickness
 Shape : - Cylindrical and ablong, finger shaped

Turmeric Types: -

Long shaped rhizome
 Oval shaped rhizome

Geographical Source: -

The plant is native to Southern Asia and is cultivated extensively in temperate regions. It is grown on a larger scale in India, China, East Indies and Pakistan.

Phytochemical Composition of Turmeric: -

Alkaloid: 0.76%, Flavonoid: 0.40 %, Saponin: 0.4 %, Tannin: 0.40 %

Turmeric Medicinal Uses

From many years awareness of turmeric and its use as medicine is continuously increasing. A flowering plant, Turmeric, in the ginger family, is commonly used as a food coloring and is one of the basic ingredients in curry powder. To heal many health disorders like liver problems, digestive disorders, treatment for skin diseases and wound healing turmeric has long been used in Medicinal as an anti-inflammatory. Curcumin is the active ingredient in turmeric which has been shown to have a wide range of therapeutic effects [10].



Digestive Disorders

Turmeric is considered as a digestive bitter and a carminative. It can be added into foods including rice and bean dishes to improve digestion, reduce gas and bloating. It is a cholagogue, stimulating bile production in the liver and encouraging excretion of bile via the gall bladder. This improves the body's ability to digest fats. For chronic digestive weakness and/or congestion turmeric is recommended. It can be taken as a single extract or in the form of digestive bitters, which combine turmeric with other bitter and carminative herbs. Turmeric is beneficial for people who feel tired after consuming meals or who experience gas and bloating. Whatever way turmeric is consumed it is beneficial to both the digestive system and the liver.

Liver Disease

Turmeric is beneficial for its influence on the liver. In spring more consumption of herbs and foods can strengthen the liver. Turmeric shares similar liver protectant compounds that milk thistle and artichoke leaves contain. It is said to shrink engorged hepatic ducts, so it can be useful to treat liver conditions such as hepatitis, cirrhosis, and jaundice.

Cancer

Recent scientific research confirm that turmeric can cure host of diseases, also they found that turmeric restrains the growth of various types of cancer. Turmeric is used for the treatment of skin cancer or pre-cancerous skin conditions. Both topical and internal uses are beneficial [10].

Menstrual Problems of Woman

For women who experience monthly menstrual cramps, try using turmeric extract or bitters twice daily for two weeks prior to expected menstruation. Turmeric is an antispasmodic to smooth muscles so it reduces digestive and menstrual cramping. It should reduce the severity of pain, if not ease them completely. Certainly, diet and standard of living have a reflective influence on the menstrual cycle, but turmeric is a great addition.

Bacterial Infection / Wounds

Turmeric is useful as an external antibiotic in preventing bacterial infection in wounds.

Eye Disorder

Curcumin may prove to be as effective as corticosteroids in the uveitis (inflammation of the uvea, the middle layer of the eye between the sclera - white outer coat of the eye and the retina – the back of the eye) the type of eye disorder.

Other Health Disorders

Turmeric decreases congestion and inflammation from stagnant mucous membranes. Turmeric is anti-inflammatory to the mucous membranes, which coat the throat, lungs, stomach and intestines. Regular use of turmeric can benefit from Colitis, Crohn's disease, diarrhea, and post giardia or post salmonella conditions. The itching and inflammation that accompanies hemorrhoids and anal fissures can reduce by use of turmeric. Turmeric can also benefit skin conditions including: eczema, psoriasis and acne, for those it is potent detoxifier. Turmeric gives the energy of the Divine Mother and grants prosperity of health. Turmeric is effectual for purification the chakras, as well as purifying the path of the subtle body.

Turmeric as Healing Properties

Besides flavoring food, to purify the blood and skin conditions remedy is probably the most common use of Turmeric in Ayurveda.

The main organs that turmeric treats are the skin, heart, liver and lungs.

Turmeric is used for epilepsy and bleeding disorders, skin diseases, to purify the body mind, and to help the lungs expel Kapha.

Activities of Turmeric Include: Alterative, analgesic, antibacterial, anti-inflammatory, anti-tumor, anti-allergic, antioxidant, antiseptic, antispasmodic, appetizer, astringent, cardiovascular, carminative, cholagogue, digestive, diuretic, stimulant, and vulnerary.

Therapeutic Uses of Turmeric: Anemia, cancer, diabetes, digestion, food poisoning, gallstones, indigestion, IBS, parasites, poor circulation, staph infections, and wounds.

Turmeric helps to regulate the female reproductive system and purifies the uterus and breast milk, and in men it purifies and builds semen, which is counterintuitive for a pungent bitter.

Turmeric reduces fevers, diarrhea, urinary disorders, insanity, poisoning, cough, and lactation problems in general.

Turmeric is used to treat external ulcers that respond to nothing else. Turmeric decreases Kapha and so is used to remove mucus in the throat, watery discharges like leucorrhea and any pus in the eyes, ears, or in wounds, etc.

In Ayurvedic cooking, turmeric is everywhere, this multifaceted wonder spice helps

- Detoxify the liver
- Balance cholesterol levels
- Fight allergies
- Stimulate digestion
- Boost immunity
- Enhance the complexion

It is also an antioxidant Ayurveda recognizes turmeric as a heating spice, contributing bitter, pungent and astringent tastes [10].

III. REMEDIES OF TURMERIC



Anemia

Everyday take a dose of 1 tsp of turmeric juice mixed with honey.

Asthma

Boil 1 cup of milk with 1 tsp of turmeric powder. Drink warm.

Burns

Mix 1 tsp of turmeric with 1 tsp of aloe gel and apply to burnt area.

Conjunctivitis

Mix 1 tsp of crushed, raw turmeric in 1/3 cup of water. Boil and sieve. 2–3 drops of this mixture may be used in each eye up to 3 times per day.

Complexion

Apply a paste of turmeric on the skin before bed, and wash off after a few minutes. In the morning, remove any remaining yellow tinge with a paste of chickpea flour (besan) and oil.

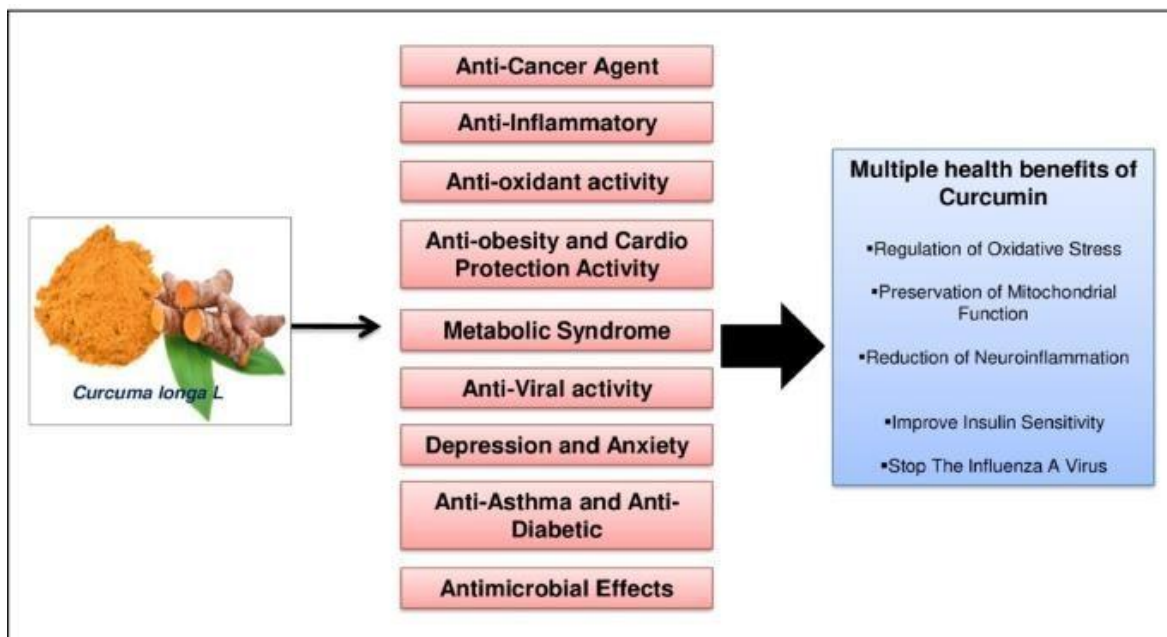
Dental Problems

Mix 1 tsp of turmeric with ½ tsp of salt. Add mustard oil to make a paste. Rub the teeth and gums with this paste twice daily.

Diabetes

½-1 tsp of turmeric should be taken 3 times a day.

IV. MAJOR ACTIVITIES OF TURMERIC



Turmeric as an Anti-Cancer Agent

Cancer is a disease in which some of the body's cells grow uncontrollably and spread to other parts of the body. Cancer can start almost anywhere in the human body, which is made up of trillions of cells. Normally, human cells grow and multiply (through a process called cell division) to form new cells as the body needs them. When cells grow old or become damaged, they die, and new cells take their place. Sometimes this orderly process breaks down, and abnormal or damaged cells grow and multiply when they shouldn't. These cells may form tumors, which are lumps of tissue. Tumors can be cancerous or not cancerous [2].

Mechanism of Action of Curcumin as an Anticancer Agent

An imbalance between cell death and cell proliferation is regarded as one of the major causal factors of cancer. Uncontrolled cell proliferation is likely to occur if the cells skip death, which can lead to various types of cancers. The intrinsic and extrinsic pathways are responsible for generating apoptotic signals. It has been found that the intrinsic pathway plays a role via inducing the mitochondrial membrane to suppress the expressions of B-cell lymphoma-extra-large and B-cell lymphoma 2 (Bcl-2). CUR has the ability to disrupt the balance of mitochondrial membrane potential, which can result in increased Bcl-xL suppression. On the other hand, the extrinsic apoptotic pathway functions via inducing the tumor necrosis factor (TNF)-associated apoptosis and elevating the death receptors (DRs) on cells [24]. In this pathway, CUR plays a role via upregulating DR4 and DR expression. It has been revealed by in vitro studies that CUR and its derivatives can excellently stimulate apoptosis in various cell lines through downregulating or suppressing intracellular transcription factors. These transcription factors include matrix metalloproteinase-9 (MMP-9), signal transducer and activator of transcription 3 (STAT3), cyclooxygenase II (COX-2), activator protein 1 (AP-1), nuclear factor-kappa B (NF-κB), and nitric oxide synthase.

Anti-Inflammatory Agent

Oxidative stress has been implicated in many chronic diseases, and its pathological processes are closely related to those of inflammation, in that one can be easily induced by another. In fact, it is known that inflammatory cells liberate

a number of reactive species at the site of inflammation leading to oxidative stress, which demonstrates the relationship between oxidative stress and inflammation [3]. In addition, a number of reactive oxygen/nitrogen species can initiate an intracellular signaling cascade that enhances pro-inflammatory gene expression. Inflammation has been identified in the development of many chronic diseases and conditions. These diseases include Alzheimer's disease (AD) [16]. Parkinson's disease, multiple sclerosis, epilepsy, cerebral injury, cardiovascular disease, metabolic syndrome, cancer, allergy, asthma, bronchitis, colitis, arthritis, renal ischemia, psoriasis, diabetes, obesity, depression, fatigue, and acquired immune deficiency syndrome AIDS. Tumor necrosis factor α (TNF- α) is a major mediator of inflammation in most diseases, and this effect is regulated by the activation of a transcription factor, nuclear factor (NF)- κ B. Whereas TNF- α is said to be the most potent NF- κ B activator, the expression of TNF- α is also regulated by NF- κ B. In addition to TNF- α , NF- κ B is also activated by most inflammatory cytokines; gram-negative bacteria; various disease-causing viruses; environmental pollutants; chemical, physical, mechanical, and psychological stress; high glucose; fatty acids; ultraviolet radiation; cigarette smoke; and other disease-causing factors[25]. Therefore, agents that downregulate NF- κ B and NF- κ B-regulated gene products have potential efficacy against several of these diseases. Curcumin has been shown to block NF- κ B activation increased by several different inflammatory stimuli [9]. Curcumin has also been shown to suppress inflammation through many different mechanisms beyond the scope of this review, thereby supporting its mechanism of action as a potential anti-inflammatory agent [11].

Antioxidant Activity

Antioxidant and anti-inflammatory properties are the two primary mechanisms that explain the majority of the effects of curcumin on the various conditions discussed in this review [21]. Curcumin has been shown to improve systemic markers of oxidative stress. There is evidence that it can increase serum activities of antioxidants such as superoxide dismutase (SOD). A recent systematic review and meta-analysis of randomized control data related to the efficacy of supplementation with purified curcuminoids on oxidative stress parameters—indicated a significant effect of curcuminoids supplementation on all investigated parameters of oxidative stress including plasma activities of SOD and catalase, as well as serum concentrations of glutathione peroxidase (GSH) and lipid peroxides. It is noteworthy to point out that all of the studies included in the meta-analysis utilized some sort of formulation to overcome bioavailability challenges, and four out of the six used piperine. Curcumin's effect on free radicals is carried out by several different mechanisms. It can scavenge different forms of free radicals, such as reactive oxygen and nitrogen species (ROS and RNS, respectively) [22]; it can modulate the activity of GSH, catalase, and SOD enzymes active in the neutralization of free radicals [3]; also, it can inhibit ROS-generating enzymes such as lipoxygenase/cyclooxygenase and xanthine hydrogenase/oxidase. In addition, curcumin is a lipophilic compound, which makes it an efficient scavenger of peroxy radicals, therefore, like vitamin E, curcumin is also considered as a chain-breaking antioxidant.

Cardioprotective Potency of Turmeric

Curcumin has been reported to induce autophagy in human umbilical vein endothelial cells (HUVECs) which serves as a therapeutic avenue for the treatment of oxidative stress-related cardiovascular diseases. Curcumin was evidenced to induce cardioprotective effect against catecholamine-induced cardiotoxicity via preservation of mitochondrial function. Male Wistar rats received subcutaneous injection of isoprenaline for a period of 2 days consecutively with or without pretreatment with curcumin 60 mg·kg⁻¹·day⁻¹. Isoprenaline induced apoptosis and cell death which was found to be protected by curcumin. Moreover, mitochondrial swelling and respiration were prevented by curcumin and it prevented the ISO-induced increase in mPTP calcium susceptibility in isolated cardiomyocytes. The turmeric extract has been found to have therapeutic activities that block the cardiac, renal and hepatic toxicities induced by doxorubicin. This is due to its free radical scavenging activity [23]. Curcumin was reported to decrease serum cholesterol level and hence it protects against the pathological changes occurring with atherosclerosis. Curcumin has p300-HAT inhibitory effects and because of this it prevents the development of cardiac hypertrophy and heart failure. It also prevents atrial arrhythmias and ventricular arrhythmias. Oral pretreatment with curcumin (200 mg/kg) on isoproterenol-induced myocardial injury in rats was found to increase antioxidant activity of curcumin, hence, showing cardioprotective property. Curcumin enhances the activities of detoxifying enzymes like glutathione-S-transferase and inhibits free-radical generation in myocardial ischemia in rats [8].

Metabolic Syndrome

Metabolic syndrome is a group of conditions that together raise your risk of coronary heart disease, diabetes, stroke, and other serious health problems. Metabolic syndrome is also called insulin resistance syndrome.

The idea that curcumin can attenuate systemic inflammation has implications beyond arthritis, as systemic inflammation has been associated with many conditions affecting many systems. One such condition is Metabolic syndrome (MetS), which includes insulin resistance, hyperglycemia, hypertension, low high-density lipoprotein cholesterol (HDL-C), elevated low-density lipoprotein cholesterol (LDL-C), elevated triglyceride levels, and obesity, especially visceral obesity [13]. Curcumin has been shown to attenuate several aspects of MetS by improving insulin sensitivity, suppressing adipogenesis, and reducing elevated blood pressure, inflammation, and oxidative stress. In addition, there is evidence that curcuminoids modulate the expression of genes and the activity of enzymes involved in lipoprotein metabolism that led to a reduction in plasma triglycerides and cholesterol and elevate HDL-C concentrations [15]. Both overweight and obesity are linked to chronic low-grade inflammation; although the exact mechanisms are not clear, it is known that pro-inflammatory cytokines are released. These cytokines are thought to be at the core of the complications associated with diabetes and cardiovascular disease. Therefore, addressing inflammation is important.

Anti-Viral Activity

According to data, curcumin appears to have an inhibitory effect on the infection of various viruses. These strategies entail direct interference with viral replication machinery or regulation of viral replication-related cellular signaling pathways such as PI3K/Akt and NF- κ B to exert antiviral activity. Most antiviral drugs, such as curcumin, target important phases in the viral life cycle; a virus cannot contain all the enzymes required for replication as a single unit. Viruses take over cellular machinery to facilitate their replication and metabolic functions. On the other hand, an antiviral agent must limit viral development in infected cells while leaving healthy cells alone. As a result, various steps in the virus's replication cycle, including attachment/penetration, uncoating, genome replication, gene expression, assembly, and release, have been appealing targets for chemotherapeutic intervention. Curcumin's bio-functions include reversing viral infection by targeting viral entry or attacking only the components required for viral reproduction [5].

Coronavirus disease-19 (COVID-19) is a dreadful respiratory illness caused by a newly discovered coronavirus (CoV) strain known as SARS-CoV-2. SARS-CoV-2 much resembles SARS-associated coronavirus (SARS-CoV) that caused the SARS pandemic in 2003. It was first detected in Wuhan city, Hubei province, China, in December 2019, and as of Dec 02, 2020, over 64 million people are diagnosed with COVID-19, with around 1.48 deaths reported across the world. WHO has declared COVID-19 as a global pandemic, and the prediction is that the number of deaths due to COVID-19 will further worsen in the coming months. In most cases, COVID-19 patients exhibit fever, dry cough, dyspnea, fatigue, and myalgia [20]. However, in severe cases, COVID-19 patients develop fatal complications such as severe pneumonia, acute respiratory distress syndrome (ARDS), septic shock, arrhythmia, and acute cardiac injury. Other than the management with ventilator support and other supportive care, there are no effective treatments available for COVID-19. Therefore, there is an urgent need for the discovery and development of therapeutics for COVID-19.

Antiviral effects of curcumin against enveloped viruses including SARS-CoV-2. A large body of evidence have documented curcumin's direct antiviral activity against several enveloped viruses, including SARS-CoV. Wen et al. (2007) used cytopathic effects of SARS-CoV in Vero 6 cells as a cell-based assay to screen phytochemicals against SARS-CoV. They reported that curcumin (at 20 μ M and 40 μ M) showed significant anti-SARS-CoV activity [4].

Anti-Asthmatic

Asthma is a chronic (long-term) condition that affects the airways in the lungs. The airways are tubes that carry air in and out of your lungs. In this condition, the airways can become inflamed and narrowed at times. This makes it harder for air to flow out of your airways when you breathe out.

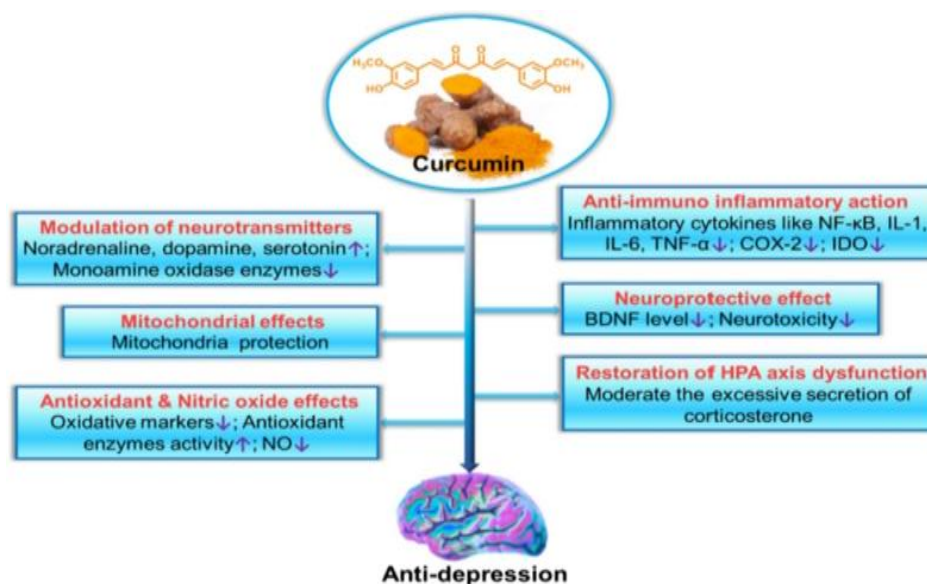
Turmeric has been shown to break down mucus, which makes it easier for your body to remove the mucus from its airways. The breakdown and removal of mucus may also help relieve coughing and improve your ability to

breathe. Curcumin (which belongs to polyphenols) is proven to reduce airway inflammation, mucus secretion, and AHR in asthmatic mice by blocking NF- κ B, downregulating Notch, and activating Nrf2/HO-1 pathways [8].

Depression and Anxiety

Depression is a common, chronic, recurrent and psychiatric disorder that seriously affects the quality of life and increases the risk of mortality. With an increasing worldwide morbidity and risk of suicide, it has resulted in serious personal suffering and economic loss. Depression is a complex disorder with multifactorial aetiologies including genetic and environmental factors.

Although the antidepressant mechanisms of curcumin on mental disorders are not yet entirely elucidated, there has been more and more research focusing on related studies in recent years. As one of the most rapidly growing fields in the psychiatric research, different mechanisms for the antidepressant effects of curcumin have been proposed. In the past decades, growing evidence has supported that curcumin could be in favour of enhancing the antidepressant efficacy via multiple mechanisms of action [6].



Anxiety is a feeling of fear, dread, and uneasiness. It might cause you to sweat, feel restless and tense, and have a rapid heartbeat. It can be a normal reaction to stress. For example, you might feel anxious when faced with a difficult problem at work, before taking a test, or before making an important decision.

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Antimicrobial effects

Microbes are organisms that are too small to be seen without using a microscope, so they include things like bacteria, archaea, and single cell eukaryotes — cells that have a nucleus, like an amoeba or a paramecium. Sometimes we call viruses microbes too.

Turmeric extract and the essential oil of *Curcuma longa* inhibit the growth of a variety of bacteria, parasites, and pathogenic fungi. A study of chicks infected with the caecal parasite *Eimera maxima* demonstrated that diets supplemented with turmeric resulted in a reduction in small intestinal lesion scores and improved weight gain [18]. Another study, in which guinea pigs were infected with either dermatophytes, pathogenic molds, or yeast, found that topically applied turmeric oil inhibited dermatophytes and pathogenic fungi.

Improvements in lesions were observed in the dermatophyte- and fungi-infected guinea pigs, and at seven days post-turmeric application the lesions disappeared. Curcumin has also been found to have moderate activity against *Plasmodium falciparum* and *Leishmania major* organisms [19]. Khattak et al. 2005 studied the antifungal, antibacterial,

phytotoxic, cytotoxic and insecticidal activity of an ethanolic extract of turmeric. The extract showed antifungal activity towards *Trichophyton longifusus* and *Microsporium canis* and weak antibacterial activity against *Staphylococcus aureus*. Toxic activity was observed against *Lemna minor*. The *Curcuma longa* treated rabbit group showed a significant higher mean value for contraction of the wound compared to controls. Furthermore, the wounds showed less inflammation and an increasing trend in the formation of collagen.

Anti-Diabetic

Diabetes is a chronic, metabolic disease characterized by elevated levels of blood glucose (or blood sugar), which leads over time to serious damage to the heart, blood vessels, eyes, kidneys and nerves. The experimental study has proved that turmeric has significant role in diabetes. It has been observed that a hexane extract (containing ar-turmerone), ethanolic extract (containing ar-turmerone, curcumin, demethoxycurcumin and bisdemethoxycurcumin) and ethanolic extract from the residue of the hexane extraction (containing curcumin, demethoxycurcumin and bisdemethoxycurcumin) are dose dependent stimulation of adipocyte differentiation. The result shows that the extract of turmeric ethanolic is the composition of curcuminoids and sesquiterpenoids is more strongly hypoglycemic than either curcuminoids or sesquiterpenoids [17]. The effects of turmeric on postprandial plasma glucose and insulin are remarkable. It was observed that the ingestion of 6 g *Curcuma longa* had no significant effect on the glucose response. Insulin changes extensively higher 30 min and 60 min after the OGTT including *Curcuma longa*. It is also been observed that AUC of insulin increases significantly after the ingestion of *Curcuma longa* and OGTT. Turmeric also decreases complications in diabetes mellitus. Experimental study on albino rats shows the effectiveness of turmeric on blood sugar and polyol pathway found that both turmeric and curcumin decreased blood sugar level in alloxan-induced diabetes [14]. The pharmacological studies which we carried on curcumin had showed a significant anti-asthmatic activity. Since, the effectiveness of curcumin has been utilized among ethnic population, especially for anti-cough or as an expectorant. Asthma is a disease of the airways which is chronic in nature. The inflammation of the airways results in increased contractability of the smooth muscles which are surrounding the airways. As a result of this, the airways are narrowed and finally it results in wheezing [7].

IV. HEALTH BENEFITS OF TURMERIC IN OUR DAILY LIFE: -

1. It is a natural antiseptic and antibacterial agent, useful in disinfecting cuts and burns [10].
2. When combined with cauliflower, it has shown to prevent prostate cancer and stop the growth of existing prostate cancer.
3. It prevents breast cancer from spreading to the lungs in mice.
4. It may prevent melanoma and cause existing melanoma cells to commit suicide.
5. It reduces the risk of childhood leukemia.
6. Is a natural liver detoxifier.
7. It may prevent and slow the progression of Alzheimer's disease by removing amyloid plaque buildup in the brain.
8. It may prevent metastases from occurring in many different forms of cancer.
9. It is a potent natural anti-inflammatory that works as well as many anti-inflammatory drugs but without the side effects.
10. It has shown promise in slowing the progression of multiple sclerosis in mice.
11. It may help in the treatment of psoriasis and other inflammatory skin conditions [10].
12. It may aid in fat metabolism and help in weight management.
13. It has long been used in Chinese medicine as a treatment for depression.
14. Because of its anti-inflammatory properties, it is a natural treatment for arthritis and rheumatoid arthritis.
15. Boosts the effects of chemo drug paclitaxel and reduces its side effects.
16. Promising studies are underway on the effects of turmeric on pancreatic cancer.
17. Studies are ongoing in the positive effects of turmeric on multiple myeloma.
18. It has been shown to stop the growth of new blood vessels in tumors.
19. Speeds up wound healing and assists in remodeling of damaged skin

V. CONCLUSION

Curcumin has received worldwide attention for its multiple health benefits, which appear to act primarily through its anti-oxidant and anti-inflammatory mechanisms. These benefits are best achieved when curcumin is combined with agents such as piperine, which increase its bioavailability significantly. Research suggests that curcumin can help in the management of oxidative and inflammatory conditions, metabolic syndrome, cancer, arthritis, anxiety, asthma, diabetes, depression and hyperlipidemia. It may also help in the management of exercise-induced inflammation and muscle soreness, thus enhancing recovery and subsequent performance in active people. In addition, a relatively low dose can provide health benefits for people that do not have diagnosed health conditions.

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