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Medicinal Uses of Curcumin

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ABSTRACT

Turmeric, a spice that has long been known for its medicinal properties, has found interest in both medical / scientific and cooking people, as it is a major source of polyphenol curcumin. It helps in the management of oxidative and inflammatory conditions, metabolic syndrome, arthritis, anxiety and hyperlipidemia. It can also help in the management of inflammation caused by exercise and muscle pain, thereby improving recovery and performance in working people. In addition, a very small amount of complexity can provide health benefits to people who do not have acquired health conditions. Many of these benefits can be attributed to its anti- inflammatory effects. The inclusion of curcumin alone does not lead to concomitant health benefits due to its poor availability, which is mainly due to poor absorption, rapid metabolism, and rapid removal. There are several factors that can increase the availability of bioavailability. For example, piperine is a major active ingredient of black pepper and, when mixed in a complex with curcumin, has been shown to increase bioavailability by 2000%. Curcumin combined with developmental supplements offers many health benefits. The purpose of this review is to provide anoverview of a number of studies on the health benefits of curcumin.

Keywords: Curcumin, Turmeric, Antioxidant, Anti-inflammatory, Polyphenol

INTRODUCTION

Medicinal plants have provided a reliable source of new drug preparation and disease control, since the beginning of civilization. Extensive literature research has shown that Curcuma longa L. or turmeric (from the Zingiberaceae family) is considered a pioneer of herbal medicine with many medicinal properties. the earth. It is widely grown in Asian countries, especially China and India. This plant grows up to 1 m with a short stem. Turmeric is an important spice worldwide for its outstanding human consumption especially in the Orient . Apart from being used as a spice, it is used as a traditional medicine in Asian countries such as India, Bangladesh and Pakistan because of its beneficial properties. It is called turmeric (Zarchooveh in Iran) and has been used extensively for its flavor, as well as for medicinal properties.

Current traditional medicine says that its powder fights intestinal diseases, especially biliary and hepatic diseases, diabetic wounds, rheumatism, inflammationsinusitis, anorexia, coryza and cough . The coloring agent of turmeric is called curcumin, which is yellow in color and is an important component of this plant. Recent studies have confirmed turmeric as an anticancer, anti-diabetic,

antioxidant, hypolipidemic, anti-inflammatory, antimicrobial, anti-fertility, anti-venom, hepatoprotective, nephroprotective, anticoagulant, etc. This plant has also been shown to have an anti-HIV function in the fight against AIDS. These therapeutic properties of turmeric have led to its being considered as a spice with many medicinal properties.

PHYTOCOMPONENTS OF TURMERIC

Turmeric contain 69.4% carbohydrates, 6.3% protein, 5.1% fat, 3.5% minerals, and 13.1%. moisture. Essential oil (5.8%) obtained by steam distillation contains Sesquiterpenes (53%), ziberene (25%), phellandrene (1%), sabinene (0.6%), cineol (1%), and borneol (0.5%). Curcumin (3-4%) is yellow in color, and contains curcumin I (94%), curcumin II (6%) and curcumin III (0.3%). The findings of Demethoxy and bisdemethoxyxy curcumin have also been isolated from turmeric. Curcumin has a melting point at 176–177 ° C; forms reddish brown salts with alkali and is soluble in acetic acid, ethanol, alkali, ketone and chloroform. Presence of tumerone a, tumerone b, curzerenone, curdione, mono- and di-demethoxycurcumin have been reported in rhizomes. Essential oils of C leaves. longa analyzed by Gas Liquid Chromatography and reported to contain linalool, caryophyllene, geraniol, α-pinene, β-pinene, sabinene, myrcene, α-phellandrene, i -1,8-cineole, ip- cymene, C8-aldehyde, and methyl heptanone (6). Novel quiterpene, (6S) -2-methyl-6- (4- hydroxyphe-nyl-3-methyl) -2-hepten-4-one, two new metabolites ses of quiterpenes, (6S) -2-methyl-6- (4-hydroxyphenyl) -2-hep-ten-4-one, (6S) -2- methyl-6- (4-formylphenyl) -2-hepten-4-one, and two calebin, 4 "- (4 "'-hydroxyphenyl-3"' - methoxy) - 2 "-oxo-3" -butenyl-3- (4'-hydroxyphenyl) -propenoate and 4 "- (4" '- hydroxyphenyl) - 2 "-oxo- 3 "-butnyl-3- (4'-hydroxyphenyl- 3'-methoxy) -propenoate was isolated along with the five known squiterpenes bisabolane of turmeric .

ANTIOXIDANT ACTIVITY

Curcumin has been shown to be a potent component of free oxygen radicals. Its antioxidant activity is compared to vitamins C and E. It can protect lipids or hemoglobin from oxidation. It can significantly inhibit the formation of active reactive oxygen species (ROS) such as H_2O_2, superoxide anions and nitrite radical generation by active macrophages. Its release, bis-demethoxycurcumin and demethoxycurcumin also have antioxidant activities . An in vitro study that measures the effect of curcumin on an undigested protein, has led to increased cellular resistance to oxidative damage.

CARDIOVASCULAR & ANTI-DIABETIC EFECTS

Diabetic activity and inhibits platelet aggregation. A study of 18 atherosclerotic rabbits given 1.6–3.2 mg / kg / day of turmeric release showed a decrease in LDL's tendency to lipid peroxidation, in addition to low plasma cholesterol and triglyceride levels. The effect of Turmeric on cholesterol levels may be due to decreased intestinal cholesterol intake and increased conversion of cholesterol into bile acid in the liver. Inhibition of platelet aggregation by turmeric constituents is thought to be due to the potency of prostacyclins synthesis and inhibition of thromboxane synthesis.Both turmeric lowers blood glucose levels in diabetic rats. Turmeric also reduces the risk of diabetes. Additional clinical studies need to be performed in this area to find appropriate dosages for cardiovascular protection and lipid or glucose lowering functions.

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INFLAMMATORY & EDEMATIC DISORDERS

In vitro, and in vivo studies have shown their effects in reducing acute and chronic inflammation. Curcumin prevented edema in doses of between 50 and 200 mg/kg, in mice. A 50% reduction in edema was achieved with a body weight of 48 mg/kg, with curcumin almost acting as cortisone and phenylbutazone in equal amounts. In mice, low doseof 20-80 mg/kg reduced paw swelling and edema. Curcumin also inhibited formaldehyde-induced arthritis in rats at 40 mg/kg and showed no significant toxicity at doses of up to 2 g/kg/day (8). In an animal study, arthritis caused by a streptococcal cell wall, an intraperitoneal injection of turmeric extract containing 4 mg total curcuminoids/kg/day for four days before the introduction of arthritis, prevented joint inflammation (75%) and chronic (75%) and chronic (68)%) categories. To test the effectiveness of oral preparation, a 30-fold dose of curcuminoid preparation, given to mice four days before the onset of arthritis, reduced joint inflammation by 48%.

GASTROINTESTINAL EFFECTS

Turmeric also prevents the formation of ulcers caused by stress, alcohol, Indomethacin, reserpine, pyloric ligation, promotes stomach wall fungus in mice exposed to these stomach ulcers. It also prevents intestinal inflammation and increases the enzyme secretion of bicarbonate, gastrin, secretin and pancreatic. An open, phase II trial performed on 25 patients with endoscopic gastric ulcer, given 600 mg powdered turmeric five times daily, showed complete recovery in 48% of patients. No adverse reactions or abnormalities of blood flow were recorded . Curcumin reduced mucosal damage in mice with experimental colitis. Ten days before the onset of colitis, with 1, 4, 6-trinitrobenzene sulphonic acid, administration of 50mg/kg curcumin resulted in a significant reduction in diarrhea, neutrophil infiltration and lipid peroxidation in colonic tissue. And all inflammation of the indexes is reduced and symptoms improve. In experimental rat models of mice, curcumin was able to reduce inflammation. In cerulean or ethanol produced by pancreatitis, curcumin has also been able to prevent inflammatory mediators, leading to increased morbidity as measured by histology, pancreatic trypsin, serum amylase, and neutrophil infiltration.

ANTICANCER EFFECTS

Several studies have shown that curcumin is able to inhibit carcinogenesis in three stages: angiogenesis, tumor stimulation and tumor growth. In two studies of colon cancer and prostate cancer, curcumin has been shown to inhibit cell proliferation and tumor growth. Turmeric and curcumin are also able to suppress the activity of many common mutagens and carcinogens. The anticarcinogenic effects of turmeric and curcumin are related to directing anti-antioxidant and free-radical effects, as well as their ability to indirectly increase glutathione levels, thereby helping to reduce hepatic intake of mutagens and carcinogens, and prevent nitrosamine formation. Curcumin toohas been shown to prevent the effect of mutagenic ingestion of UV rays.

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ANTIMICROBIAL ACTIVITY

Studies of chicks infected with Eimera maxima have shown that a diet rich in 1% turmeric has led to reduced intestinal ulcers and improved weight gain. In another animal study, the use of turmeric dermeredophyte dermatophytes and pathogenic fungi in guinea pigs in the 7-day post-turmeric application. Curcumin has also been found to have moderate activity against Plasmodium falciparum and Leishmania.

HEPATOPROTECTIVE & RENOPROTECTIVE EFFECTS OF TURMERIC

Turmeric have been shown to have anti-inflammatory and hepatoprotective properties such as silymarin. Animal studies have shown the protective and hepatoprotective effects of turmeric from various hepatotoxic agents. The hepatoprotective and renoprotective effects of turmeric are mainly due to its antioxidant properties, as well as its ability to reduce the formation of inflammatory cytokines (3-5). Turmeric and curcumin also alter fatty changes, biliary hyperplasia and necrosis caused by the production of aflatoxin . Sodium curcuminate, curcumin salt, also has choleretic effects by increasing the bile secretion of bile and salt, cholesterol, and bilirubin, as well as increasing the melting of bile, hence, perhaps preventing and treating cholelithiasis.

ALZHEIMER'S DISEASE

The risk of Alzheimer's disease (AD) in patients with long-term use of non-steroidal anti-inflammatory drugs (NSAIDs) that may reflect the role of brain inflammation in Alzheimer's disease. It has also been shown to increase cytokines and active microglia. It has been shown that curcumin contains NSAID-like activity and reduces oxidative damage. To test whether it may affect Alzheimer's-pathology, the effect of 160 ppm and 5000 ppm doses of dietary curcumin on inflammation, oxidative damage, and plaque pathology were examined. Both of these doses greatly reduced oxidized proteins and IL-1, a inflammatory cytokine that normally rises in the rat brain. Considering its effectiveness and its apparent toxicity, this spice has the promise of preventing Alzheimer's disease.

PHOTO-PROTECTOR ACTIVITY

Most of the lipids on the surface of the skin are not filtered. Therefore, they are easily attacked by free radicals. The sun's ultraviolet rays penetrate the skin and accelerate the damage caused by these radicals. Prolonged exposurethese rays can degrade lipids thereby causing skin damage. In laboratory studies, turmeric extract has been shown to be effective in suppressing inflammation and protecting epidermal cells from damage caused by ultraviolet B radiation . Curcumin, in small doses of turmeric has been shown to protect against chromosomal damage caused by gamma rays.

CONCLUSION

Turmeric is a unique source of a wide variety of chemicals, which are responsible for a variety of functions. Although much research has been done on turmeric, however, more research is needed to

exploit another anti-inflammatory drug. A drug development program should be put in place to improve modern medicine. Although raw extracts from the leaves or rhizomes of the plant have medicinal uses, modern medicine can be developed after extensive research in pharmacotherapeutics, bioactivity, mechanism of action, and toxicity, after proper suspension and clinical testing. As the global situation has now shifted to the use of non-toxic plant products that are traditionally used medicinally, the development of modern medicine from C. Longa should be emphasized to control various diseases. Further testing needs to be done in C. Prepare to explore hidden areas and their effective use of clinics, which can be used for human well-being

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