

Turmeric Health Benefits: A Review

Abdul Hamid Khan

Abstract: Turmeric is widely used as condiments and its botanical name is *Curcuma Longa* and it belongs to ginger family (Zingiberaceae). Turmeric is used in treatment of various diseases like in cough, cold and asthma, hepatic disorders and in diabetes. The main chemical constituent of turmeric is curcumin and it mostly works as an anti-inflammatory, anti-oxidant, anti-bacterial and anti-diabetic agent. Other important chemical constituents of turmeric are curcuminoid, volatile oils, flavonoids, resins, protein and sugars. Curcuminoid works as an anti-inflammatory as it inhibits the number of molecules that causes inflammation for example phospholipase, lipoxygenase, COX-2I and leukotrienes and also reduce the production of inflammation induced by histamine. It also works as antimicrobial by inhibiting the growth of various bacteria, parasites and fungi. *Curcuma longa* also proved effective against *Plasmodium falciparum* and *Leishmania*. It is also used as hepatoprotective, neuro-protective and as a chemotherapeutic agent in prostate cancer, breast cancer, colon cancer and in lung cancer. It also inhibits the specific and non-specific mast cell dependent allergic reactions. It also works to prevent drug resistance. It also has dental applications as it eliminates the dental pain and gum swelling.

Key Words: Turmeric, chemical constituent, medicinal uses, Antioxidant

Department of Eastern
Medicine, University of Poonch,
Rawalakot

***Corresponding Author**
Email:
haamidkhaan@gmail.com

INTRODUCTION

Turmeric is widely used as condiments and it is commonly cultivated in India, Pakistan and all over the subcontinent. Its botanical name is *Curcuma longa* and it belongs to ginger family (Zingiberaceae) (1). Turmeric is used in treatment of various diseases like in cough, hepatic disorders and in diabetes. The main chemical constituent of turmeric is curcumin and it mostly works as an anti-inflammatory, antioxidant, anti-bacterial and anti-diabetic effects. Other important chemical constituents of turmeric are curcuminoid and yellow color of turmeric is due to this constituent. Turmeric has other number of chemical constituents

which are used for the treatment of diseases from centuries in India, Pakistan, subcontinent. like; flavonoids, volatile oils, sugar, protein and resins (2). It has various medicinal uses like it works for gastro intestinal disorders like it prevents mucosal damage also used in the treatment of inflammatory bowel disease. Also used in number of respiratory disorders like in bronchitis, sore throat, cough, congestion and in asthma. It works as an anti-inflammatory as it inhibits the number of molecules that causes inflammation for example phospholipase, lipoxygenase, COX-2I and leukotrienes. Turmeric being an anti-oxidant drug it prevents

atheroseclerosis thus in turn it provides protection against cardiovascular diseases (3). It also works as hepatoprotective, it cures jaundice, it is neuroprotective as it is protective against ischemic brain injury, it also works as a chemotherapeutic agent in prostate cancer, breast cancer, colon cancer and in lung cancer. It also inhibits the specific and nonspecific mast cell dependent allergic reactions. It also works to prevent drug resistance. It also has dental applications as it eliminates dental pain and gum swelling and prevents dental caries. Turmeric is widely used for beauty purposes. Its part which is used for various purposes is rhizomes. It is used in the treatment of a number of diseases like cough, asthma, diabetes etc and used for a number of beauty purposes (4).

PHYTOCONSTITUENTS

Active constituents include Flavonoid (curcumin), Curcuminoids (desmethoxycurcumin and bis-desmethoxycurcumin), Sugar, Proteins, Resins (5).

PHARMACOLOGICAL ACTIVITY

Gastro intestinal disorders:

The fresh juice of turmeric has anthelmintic effects. Curcumin causes the inhibition of nuclear factor κ B so it decreases the making of inflammatory cytokines and adhesion molecules so it improves the stomach injury in NSAID induced gastropathy in mice. It also recovers mucosal damage of stomach and reduces the leukocyte adhesion and intercellular adhesion molecules-1 and TNF α making after the inoculation of curcumin. Turmeric extract tablet drops inflammatory bowel disease occurrence and abdominal pain. After eight weeks of treatment with turmeric extract, there was major progress seen in IBS and quality of life. And it also decreases the liver inflammation by reducing the oxidative stress (6).

Inflammatory

disorders

Curcumin is involved in the inhibition of various molecules involved in inflammation and these molecules are lipoxygenase, phospholipase, COX2, prostaglandins, collagenase, elastase, interferon inducible protein, nitric oxide, tumor necrosis factor and interleukin-12. Studies show that bisdemethyleurcumin is a more powerful agent against inflammation, it is shown by the suppression of TNF induced activation of NF- κ B more powerful agents against proliferation and extra powerful in tempting reactive species of oxygen. The useful effect of curcumin in sepsis intervened by PPAR- γ upregulation causes the suppression of pro-inflammatory cytokines, Tumor necrosis factor α discharge and expression (7).

DM (DIABETES MELLITUS)

Curcuma longa crumbs with Amla juice and honey is very effective in DM. Serum insulin level is decreased after taking 6g of turmeric but in a healthy person it does not affect the plasma glucose level and GI. So we can say that turmeric is effective in insulin secretion. Turmeric plant lowers the peroxidation of lipids by controlling actions of antioxidant enzymes and these enzymes are superoxide dismutase, catalase and glutathione peroxidase in high quantity. Antioxidant characteristics of turmeric are mainly because of curcumin and its other 3 derivatives. Freeze dried powder of turmeric dissolves with milk and it is used as hypolipidemic, hepatoprotective and it is a safe dietary supplement for diabetics. The important constituent of turmeric, curcumin, inhibits the action of human pancreatic amylase so there is a decrease in starch hydrolysis results in decreased glucose level (8).

Cardiovascular disorders

As Curcuma longa contains antioxidant properties so it can prevent against atherosclerosis because it inhibits damage to cholesterol. Turmeric also has the ability to

decrease the free radical just like the vitamin c and vitamin E have. But the antioxidant properties of the vitamins are degraded by heat but the same properties of turmeric does not decrease by heat that is why we use turmeric in cooking and it gives us benefits. The study of turmeric on animal suggested that it prevent against cardiovascular diseases because it can reduce the level of cholesterol and triglycerides and any other fat which is harmful for cardiac and cause cardiac damage. And for the sake of study two groups were designed to check the properties of turmeric against atherosclerosis first group is of rats that is divided into two groups one group is given diet with turmeric and one given diet containing carbohydrates and saturated fat after 4 months of this diet consumption 20% less blockage of arteries is seen in rats taking turmeric with their diet then the mice that did not take turmeric with diet .The second group is of rabbits similarly divided into two groups one group given diet with turmeric one group is given diet containing carbohydrates and saturated fats similar results were noticed several disease containing factors were better including reduction in cholesterol and fats(9).

Hepatoprotective

curcuma longa contain curcumin it is strong antioxidant so Studies indicates that its extract increase the cell death of already damaged hepatocytes that may be a mechanism which protect the liver whereby curcumin regulates the inflammatory activity and repair the liver. The extract of turmeric with ethanol shows important hepatoprotective effects when it takes orally in the dose of 250 mg per kg and 500 mg per kg and this action is usually depend on dosage. The volatile oils of turmeric also have anti inflammatory effects (10).

Neuroprotective

By decreasing oxidative stress turmeric oil reduces the consequences of ischemia. Ischemia cause sagging of membrane potential of mitochondria and cytochrome c is liberate changing ratio of Bax: Bcl-2 and turmeric oil also reverse the initiation of consecutive apoptosis turmeric oil. So the turmeric oil is best neuro protective and use to prevent ischemic injury of brain(11).

Anticancer activity

Active chemical constituent of turmeric curcumin has an anticancer activity and this is due to its effect over the various pathways involved in the generation of genetic mutation ,expression of oncogene, regulation of cell cycle, cell death , carcinogenesis and development of cancer (12).

It shows anti proliferative effect in number of carcinomas as an avoider of NF-B and downstream products of genes. Curcmin also has an effect over the receptors of growth factors and cell adhesion molecule which are implicated in tumor growth and metastasis. Turmeric also exert its antitumor activity by changing the deregulated cycle of cells through cyclin dependent and p53 independent and p53 dependent pathways this effects of turmeric on these pathways provide the ability to the person to fight with this dangerous disease tumor (13).

Anti allergic activity

Turmeric has capability to stop specific and non-specific allergic reactions dependent on mast cells (14).

Dermoprotective effects

Juice of turmeric is utilize as in various skin infections against parasites. Turmeric leaves have strong antifungal properties and has no side effects .it protect the skin from dangerous UV- rays effects because it is strong

antioxidant and anti-carcinogen (15)

Dental caries

Periodontal disease are caused by bacteria present in dental plaque so dental plaque removal is very important for healthy teeth. But the dental plaque detection is very difficult task with the naked eye and it is challenging to find out there attachment sites. Turmeric and curcumin extract are highly effective in dental plaque detection as well as treating and preventing dental caries (16).

CONCLUSION

Turmeric have strong antioxidant, inflammatory, antibacterial, neuroprotective and hepatoprotective properties.it prevents from cardio vascular disease by preventing atherosclerosis by reducing the level of triglycerides, cholesterol and LDL and also stop platelet aggregation. It carries extensive benefits on our health in the prevention and curing of different diseases.

REFERENCES

1. Karłowicz-Bodalska K, Han ST, Freier J, Smoleński M, Bodalska A. Curcuma longa as medicinal herb in the treatment of diabetic complications. *Acta Poloniae Pharmaceutica–Drug Research*. 2017;74(2):605-10.
2. Niranjana A, Prakash D. Chemical constituents and biological activities of turmeric (*Curcuma longa* L.)-a review. *Journal of Food Science and Technology*. 2008 Mar 1;45(2):109..
3. Wongcharoen W, Phrommintikul A. The protective role of curcumin in cardiovascular diseases. *International journal of cardiology*. 2009 Apr 3;133(2):145-51.
4. Debjit Bhowmik C, Kumar KS, Chandira M, Jayakar B. Turmeric: a herbal and traditional medicine. *Archives of applied science research*. 2009;1(2):86-108...
5. Nayak S, Kaur T, Mohanty S, Ghosh G, Choudhury R, Acharya L, Subudhi E. In vitro and ex vitro evaluation of long-term micropropagated turmeric as analyzed through cytophotometry, phytoconstituents, biochemical and molecular markers. *Plant Growth Regulation*. 2011 May;64(1):91-8.
6. Gilani AH, Shah AJ, Ghayur MN, Majeed K. Pharmacological basis for the use of turmeric in gastrointestinal and respiratory disorders. *Life sciences*. 2005 May 13;76(26):3089-105..
7. Krup V, Prakash LH, Harini A. Pharmacological activities of turmeric (*Curcuma longa* Linn): A review. *J Homeop Ayurv Med*. 2013;2(133):2167-1206..
8. Arun N, Nalini N. Efficacy of turmeric on blood sugar and polyol pathway in diabetic albino rats. *Plant foods for human nutrition*. 2002 Mar;57(1):41-52...
9. Kim M, Kim Y. Hypocholesterolemic effects of curcumin via up-regulation of cholesterol 7 α -hydroxylase in rats fed a high fat diet. *Nutrition research and practice*. 2010 Jun 1;4(3):191-5.
10. Salama SM, Abdulla MA, AlRashdi AS, Ismail S, Alkiyumi SS, Golbabapour S. Hepatoprotective effect of ethanolic extract of *Curcuma longa* on thioacetamide induced liver cirrhosis in rats. *BMC complementary and alternative medicine*. 2013 Dec;13(1):1-7..
11. Jain V, Prasad V, Pal R, Singh S. Standardization and stability studies of neuroprotective lipid soluble fraction obtained from *Curcuma longa*. *Journal of pharmaceutical and biomedical analysis*. 2007 Sep 3;44(5):1079-86..
12. Perrone D, Ardito F, Giannatempo G, Dioguardi M, Troiano G, Lo Russo L, De Lillo A, Laino L, Lo Muzio L. Biological and therapeutic activities, and anticancer properties of curcumin. *Experimental and therapeutic medicine*. 2015 Nov 1;10(5):1615-23..
13. Bar-Sela G, Epelbaum R, Schaffer M. Curcumin as an anti-cancer agent: review of the gap between basic and clinical applications. *Current medicinal chemistry*. 2010 Jan 1;17(3):190-7..
14. Kocaadam B, Şanlıer N. Curcumin, an active component of turmeric (*Curcuma longa*), and its effects on health. *Critical reviews in food science and nutrition*. 2017 Sep 2;57(13):2889-95..
15. Bahraini P, Rajabi M, Mansouri P, Sarafian G, Chalangari R, Azizian Z. Turmeric tonic as a treatment in scalp psoriasis: A randomized placebo-control clinical trial. *Journal of cosmetic dermatology*. 2018 Jun;17(3):461-6..
16. Chaturvedi TP. Uses of turmeric in dentistry: An update. *Indian Journal of Dental Research*. 2009 Jan 1;20(1):107.

