

“Curcumin” for Body’s Immunity

Opinion

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Abstract

“Curcumin” is a traditional Chinese medicine used in China for a long time ago. It possesses a series of biological properties including antioxidant, anti-inflammatory, antiviral, antimicrobial, and antitumor functions to enhance the body’s immunity. This article describes the background, research progress of curcumin and its usages such as health supplements or tea daily life.

Keywords: Curcumin; Traditional Chinese Medicine; Body’s Immunity; Health Supplements; Tea

Introduction

Turmeric is a natural herbal and used as a spice in a wide variety of food. The active ingredient is called “Curcumin”, derived from a *Curcuma longa* plant belonging to the Zingiberaceae family. It is a short-stemmed perennial and grows about 100 cm in height with curved leaves, oblong, ovate, and cylindrical rhizomes [1]. According to traditional Chinese medicine (TCM) theory, the nature of curcumin is warm; bitter, and pungent in taste. This classifies as an “invigorating the blood” category [2], which stimulates blood flow, circulation, and relieves pain [3].

Research Progress

Growing evidence has shown that curcumin possesses a wide range of biological activities, such as antioxidant, anti-inflammatory, antiviral, antimicrobial, and antitumor properties (Table 1).

Health Supplement

Apart from the treatment or flight against some diseases of curcumin, it is also used as a health supplement in daily life to enhance the body’s immunity. Peterson CT et al. reported the effects of turmeric and curcumin dietary supplementation on human gut microbiota. The results have shown that 1000 mg turmeric-treated subjects displayed the modest 7% which increased as following species: *Clostridium* spp.,

Bacteroides spp., *Citrobacter* spp., *Cronobacter* spp., *Enterobacter* spp., *Enterococcus* spp., *Klebsiella* spp., *Parabacteroides* spp., and *Pseudomonas* spp., while 1000 mg curcumin displayed an average increase of 69% to combat these species [9].

Tea

Turmeric tea is one of the popular drinks nowadays since curcumin has low bioavailability, which is brewed using grated turmeric root or pure powder to have higher concentrations of biologically available and promote its absorptivity within the body. There are some simple steps for the preparation of turmeric tea:

- (i) Take around 400 mL (4 cups) of water and boil it;
- (ii) Add 1 g (1 to 2 teaspoons) of turmeric to the boiling water;
- (iii) Stir the mixture for 5 to 10 mins continuously until the turmeric completely dissolve;
- (iv) Transfer to tea container and allow it to cool at room temperature.

Based on the JECFA (The Joint United Nations and World Health Organization Expert Committee on Food Additives) and EFSA (European Food Safety Authority) reports, the Allowable Daily Intake (ADI) value of curcumin is 0-3 mg/kg body weight. It is around 1 to 3 grams daily intake for adults [10].



Table 1: Biological activities of curcumin for some diseases.

	Jakubczyk K et al. [4]	Peng Y et al. [5]	Jennings MR et al. [6]	Adamczak A et al. [7]	Walker BC et al. [8]
Objective	Antioxidant Potential of Curcumin	Anti-Inflammatory Effects of Curcumin in the Inflammatory Diseases	Curcumin as an Antiviral Agent	Curcumin, a Natural Antimicrobial Agent with Strain-Specific Activity	Antitumor Activity of Curcumin in Glioblastoma
Major function	Antioxidant	Anti-inflammatory	Antiviral	Antimicrobial	Antitumor
Results	Curcumin significantly increase total antioxidant capacity (TAC) and tendency to decrease malondialdehyde (MDA) concentration	Curcumin regulates NF-κB, MAPK, AP-1, JAK/STAT, and other signaling pathways, and inhibits the production of inflammatory mediators	Curcumin inhibits the replication of a diverse group of viruses through numerous mechanisms such as NF-κB signaling	Curcumin is effective against some species with the minimum inhibitory concentration (MIC) such as <i>Streptococcus pyogenes</i> , methicillin-sensitive <i>S. aureus</i> , <i>Acinetobacter lwoffii</i> , and individual strains of <i>Enterococcus faecalis</i> and <i>Pseudomonas aeruginosa</i>	Curcumin induces multiple cytotoxic effects in tumor cells including cell cycle arrest, apoptosis, autophagy, changes in gene expression, and disruption of molecular signaling
Significance	Curcumin reduces MDA concentration and increases total antioxidant capacity	Curcumin reduces the inflammatory response, improve symptoms, and treatment of diseases	The consumption of curcumin in high doses in humans appears to be safe, <i>in vitro</i> CC50 concentrations are tens of micromolar	Curcumin is considered acting an antibacterial agent with high selectivity.	Curcumin potentiates the effect of radiation on cancer cells and exhibits a protective effect on normal tissue
Diseases	Alzheimer's and Parkinson's disease, atherosclerosis, obesity, or simply aging	Inflammatory bowel disease, arthritis, psoriasis, depression, and atherosclerosis	Human immunodeficiency virus, zika virus, dengue virus, chikungunya virus, vesicular stomatitis virus, influenza A virus, etc	<i>Staphylococcus aureus</i> , <i>S. haemolyticus</i> , <i>Escherichia coli</i> , and <i>Proteus mirabilis</i>	Glioblastoma, malignant gliomas

Conclusion

The above information demonstrates that curcumin can enhance the body's immunity through its antioxidant, anti-inflammatory, antiviral, antimicrobial, and antitumor properties with the usage as a health supplement or tea. However, much more works need to be done for the future development of curcumin.

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