Clinical Insights: The Role of Turmeric as a Nutritional Adjunct in Surgical Recovery

Shivani Gupta, PhD

No actual or potential conflict of interest in relation to this program/presentation.

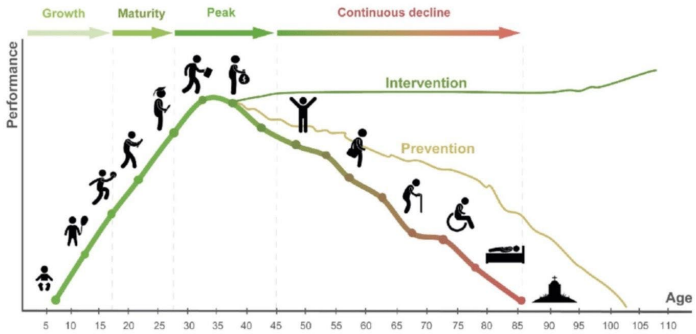
Learning Objectives

Learning Objectives:

- Investigate pioneering clinical studies on curcumin's impact on longevity biomarkers including sirtuins, cell senescence, inflammaging processes and healthspan extensions.
- Construct evidence-based practical strategies integrating curcumin with lifestyle changes in diet, stress-management and monitoring models to actualize tangible wellness benefits.
- Leave with specific applications of curcumin and Ayurveda for patients with various health issues based on inflammation and/or metabolic disease.

We will dive into curcumin's impact on:

- Chronic Inflammation
- Metabolic Disease
- OA & RA
- Neurodegenerative Diseases



The Science Behind Turmeric

International Wound Journal
Open Access

Volume 15, Issue 4
August 2018
Pages 605-617

ORIGINAL ARTICLE | Open Access

Curcumin accelerates cutaneous wound healing via multiple biological actions: The involvement of TNF-α, MMP-9, α-SMA, and collagen

Figures References Related Information

The Journal of Trauma and Acute Care Surgery

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ORIGINAL ARTICLES

Protective Effects of Curcumin against Oxidative Damage on Skin Cells In Vitro: Its Implication for Wound Healing

Phan, Toan-Thang MD; See, Patrick BSc; Lee, Seng-Teik FAMS, FRCS; Chan, Sui-Yung PhD

Author Information

The Journal of Trauma: Injury, Infection, and Critical Care 51(5):p 927-931, November 2001.

BUY

Abstract

Background

Curcumin, isolated from turmeric, has been known to possess many pharmacologic properties. It has been proven to exhibit remarkable anticarcinogenic, anti-inflammatory, and antioxidant properties. Turmeric curcumin may be a good potential agent for wound healing.

Methods

To further understand its therapeutic mechanisms on wound healing, the antioxidant effects of curcumin on hydrogen peroxide (H_2O_2) and hypoxanthine-xanthine oxidase induced damage to cultured human keratinocytes and fibroblasts were investigated. Cell viability was assessed by colorimetric assay and quantification of lactate dehydrogenase release.

Results

Exposure of human keratinocytes to curcumin at 10 μg/mL showed significant protective effect against hydrogen peroxide. Interestingly, exposure of human dermal fibroblasts to curcumin at 2.5 μg/mL showed significant protective effects against hydrogen peroxide. No protective effects of curcumin on either fibroblasts or keratinocytes against hypoxanthine-xanthine oxidase induced damage were found in our present studies.

The Journal of Trauma and Acute Care Surgery

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ARTICLE

Dietary Compounds Inhibit Proliferation and Contraction Hypertrophic Scar-Derived Fibroblasts In Vitro
Therapeutic Implication for Excessive Scarring

Phan, Toan-Thang MD; Sun, Li MD; Bay, Boon-Huat PhD; Chan, Sui-Yung PhD; Lee, Seng-Teik FRCS, FAMS

Author Information

The Journal of Trauma: Injury, Infection, and Critical Care 54(6):p 1212-1224, June 2003. | DOI: 10.1097/01.TA.000003063

BUY

Abstract

Background:

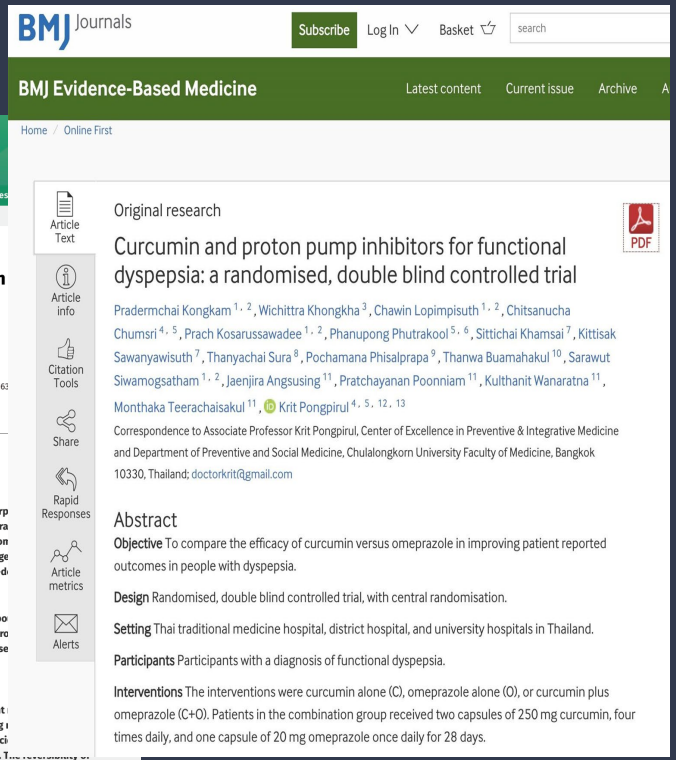
Keloid and hypertrophic scars commonly occur after injuries. Overproliferation of fibroblasts, overp and contraction characterize these pathologic scars. Current treatment of excessive scars with intra injections used individually or in combination with other methods often have unsatisfactory outcon patient and the clinician. The phytochemical compounds are well known as potential anticancer age investigated the inhibitory effects of compounds on keloid fibroblasts (KF) and hypertrophic scar-d

Methods:

Fibroblasts were cultured from nontreated earlobe keloids and burn hypertrophic scars. Ten compo hydroxybenzoic and four hydroxycinnamic acid derivatives, two flavonols [quercetin and kaempfero curcumin) were tested with fibroblasts. The inhibitory effects of compounds on fibroblasts was asse assays, fibroblast-populated collagen lattice (FPCL) contraction, and electron microscopy.

Results:

The phytochemicals significantly inhibited KF and HSF proliferation in a dose- and time-dependent hydroxybenzoic and flavonol groups, increasing inhibitory effects seemed to depend on increasing groups in their chemical structures. This phenomenon was not observed in the hydroxycinnamic aci phytochemicals inhibited fibroblast proliferation by inducing cell growth arrest but not apoptosis.



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Original research

Curcumin and proton pump inhibitors for functional dyspepsia: a randomised, double blind controlled trial

PDF

Pradermchai Kongkam [1, 2], Wichittra Khongkha [3], Chawin Lopimpisuth [1, 2], Chitsanucha Chumsri [4, 5], Prach Kosarussawadee [1, 2], Phanupong Phutrakool [5, 6], Sittichai Khamsai [7], Kittisak Sawanyawisuth [7], Thanyachai Sura [8], Pochamana Phisalprapa [9], Thanwa Buamahakul [10], Sarawut Siwamogsatham [1, 2], Jaenjira Angsusing [11], Pratchayanan Poonniam [11], Kulthanit Wanaratna [11], Monthaka Teerachaisakul [11], Krit Pongpirul [4, 5, 12, 13]

Correspondence to Associate Professor Krit Pongpirul, Center of Excellence in Preventive & Integrative Medicine and Department of Preventive and Social Medicine, Chulalongkorn University Faculty of Medicine, Bangkok 10330, Thailand; doctorkrit@gmail.com

Abstract

Objective To compare the efficacy of curcumin versus omeprazole in improving patient reported outcomes in people with dyspepsia.

Design Randomised, double blind controlled trial, with central randomisation.

Setting Thai traditional medicine hospital, district hospital, and university hospitals in Thailand.

Participants Participants with a diagnosis of functional dyspepsia.

Interventions The interventions were curcumin alone (C), omeprazole alone (O), or curcumin plus omeprazole (C+O). Patients in the combination group received two capsules of 250 mg curcumin, four times daily, and one capsule of 20 mg omeprazole once daily for 28 days.

Ayurveda: The Science of Life

Ayurveda is Excellent for Patient Optimization:
A Daily Preventive Lifestyle

- Reduce Systemic Inflammation
- Gut Health optimization
- Sleep optimization
- Detoxification protocols
- Anti-Inflammatory Diet
- Circadian Rhythm
- Balance the Doshas or Elements

Super Spices

- Turmeric
- Ginger
- Boswellia
- Ashwagandha
- Amla
- Triphala
- Brahmi
- Tulsi
- Cardamom
- Guduchi
- Cinnamon

The Problem: Inflammation

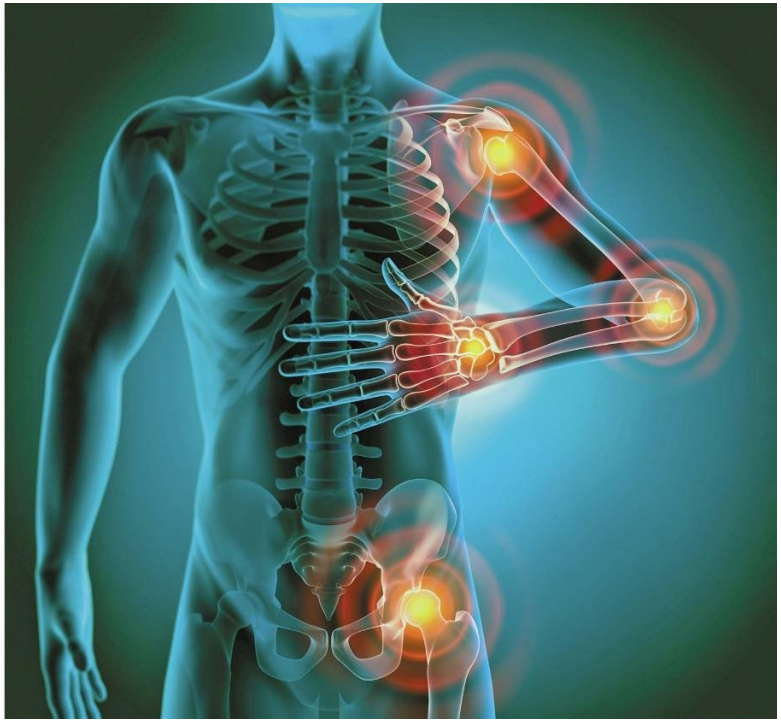
Curcumin helps prevent processes that drive aging and chronic disorders:

Immunosenescence and Infection Susceptibility:

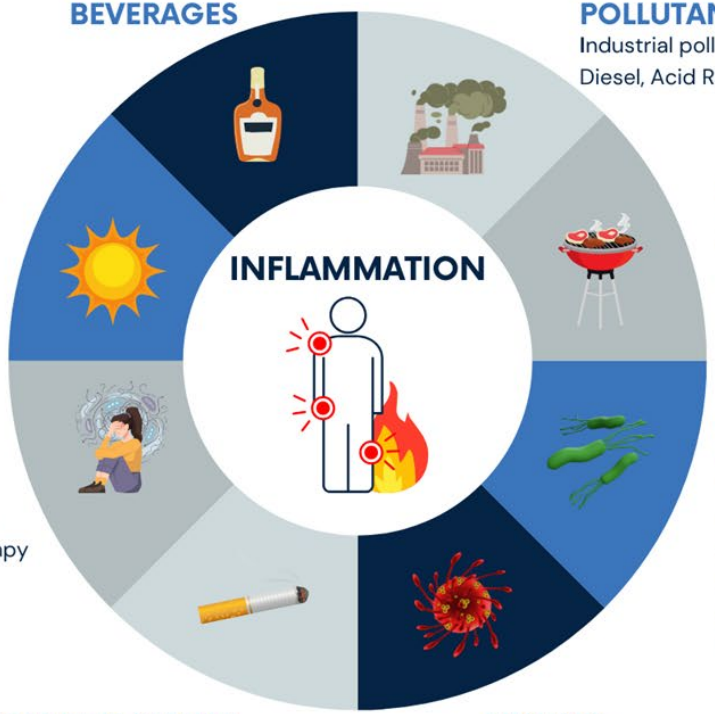
- Inflammation is linked to immunosenescence, the aging of the immune system.
- An impaired immune response increases susceptibility to infections, posing a threat to the overall health and longevity of an individual.

Impact on Tissue Repair and Regeneration

- Association with frailty
- Chronic inflammation can lead to DNA damage and genomic instability.



Gupta SC, Patchva S, Koh W, Aggarwal BB. Discovery of curcumin, a component of golden spice, and its miraculous biological activities. Clin Exp Pharmacol Physiol. 2012 Mar;39(3):283-99. doi: 10.1111/j.1440-1681.2011.05648.x. PMID: 22118895; PMCID: PMC3288651.



ALCOHOLIC BEVERAGES

ENVIRONMENTAL POLLUTANTS

Industrial pollutant,
Diesel, Acid Rain

FOOD FACTORS

Grill, Fried, Red Meat

BACTERIA

Helicobacter Pylori
Salmonella Typhi
Chlamydia pneumoniae
Streptococcus
Escherichia Coli

VIRUSES

Herpes Simplex Virus 8
Hepatitis Viruses
HPVs, HIV, EBV

CIGARETTE SMOKE

STRESS

pH, Hypoxia, Heavy
metals, Chemotherapy

ULTRAVIOLET RADIATION

Chronic Inflammation

Cells naturally age, losing function over time.

- Curcumin intervenes by halting the accumulation of aged cells, disrupting aging-related signaling pathways in the process.

- Research shows that curcumin helps *preveni* processes that drive aging and chronic disorders, including cell senescence and chronic inflammation.

The overall effect may be to improve healthy longevity:

- Healthy longevity involves a complex interplay of genes, environment, and lifestyle. Curcumin contributes with antioxidant properties, influencing various cellular processes.

- Chronic inflammation, a culprit in age-related diseases, faces effective reduction with curcumin. The overall impact extends to potential disease prevention, enhancing overall well-being.

Bielak-Zmijewska A, Grabowska W, Ciolko A, Bojko A, Mosieniak G, Bijoch Ł, Sikora E. The Role of Curcumin in the Modulation of Ageing. Int J Mol Sci. 2019 Mar 12;20(5):1239. doi: 10.3390/ijms20051239. PMID: 30871021; PMCID: PMC6429134.

Gupta SC, Patchva S, Koh W, Aggarwal BB. Discovery of curcumin, a component of golden spice, and its miraculous biological activities. Clin Exp Pharmacol Physiol. 2012 Mar;39(3):283-99. doi: 10.1111/j.1440-1681.2011.05648.x. PMID: 22118895; PMCID: PMC3288651.

Curcumin: From Farm to Pharmacy

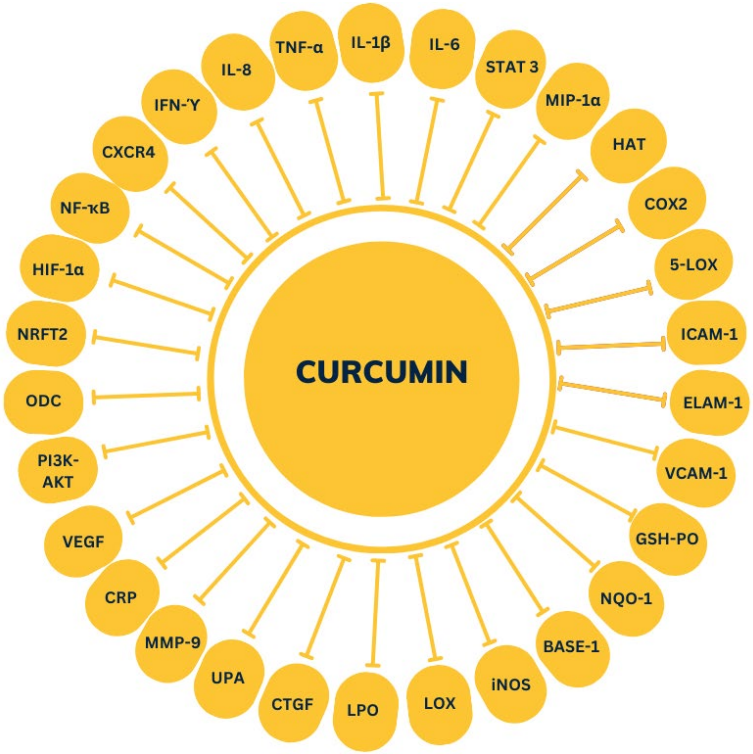
- Curcumin, also known as diferuloylmethane, is a natural polyphenolic compound originally derived from the rhizome of turmeric (*Curcuma longa* L.)
- The three curcuminoids: curcumin [1,7-bis(4-hydroxy-3-methoxy phenyl)-1,6-heptadien-3,5-dione], demethoxycurcumin (DEMC) and bisdemethoxycurcumin (BDEMC)

- Anti-inflammatory
- Antioxidant
- Anti-microbial
- Anti-viral
- Anti-fungal
- Anti-obesity
- Anti-coagulant
- Over 10,000 published articles in the last 5 years

https://pubmed.ncbi.nlm.nih.gov/22118895/

Curcumin: Proposed Mechanisms of Action

- Powerful anti-inflammatory
  - Blocks NF-kb activation and TNF-α
- Powerful antioxidant
  - Increases enzymes that break down Reactive Oxygen Species (ROS)/ Suppresses enzymes that increase ROS, increases Sirtuin (SIRT)
- Curcumin targets other molecules
  - Neuroprotective effects
  - Energy metabolism cell survival



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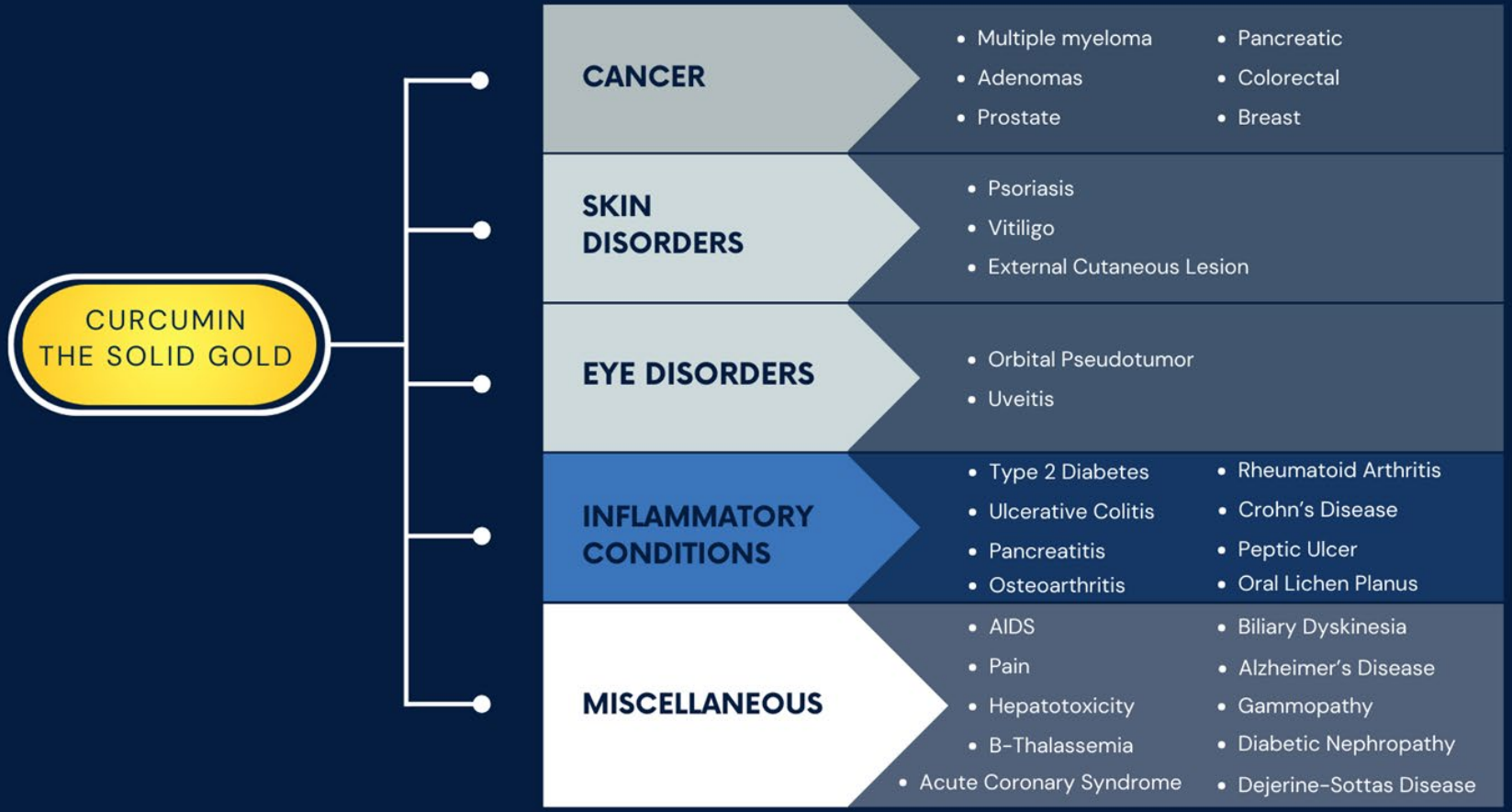
- Saraf-bank, S.; Ahmadi, A.; Paknahad, Z.; Maracy, M.; Nourian, M. Effects of Curcumin Supplementation o Inflammation and Oxidative Stress Among Healthy Overweight and Obese Girl Adolescents: A Randomiz Placebo-controlled Clinical Trial. *Phytotherapy Res* 2019, 33(8), 2015–2022. DOI: 10.1002/ptr.6370.
- Miao, Y.; Zhao, S.; Gao, Y.; Wang, R.; Wu, Q.; Wu, H.; Luo, T. Curcumin Pretreatment Attenuates Inflammat Mitochondrial Dysfunction in Experimental Stroke: The Possible Role of Sirt1 Signaling. *Brain Res. Bull* 2 15. DOI: 10.1016/j.brainresbull.2015.11.019.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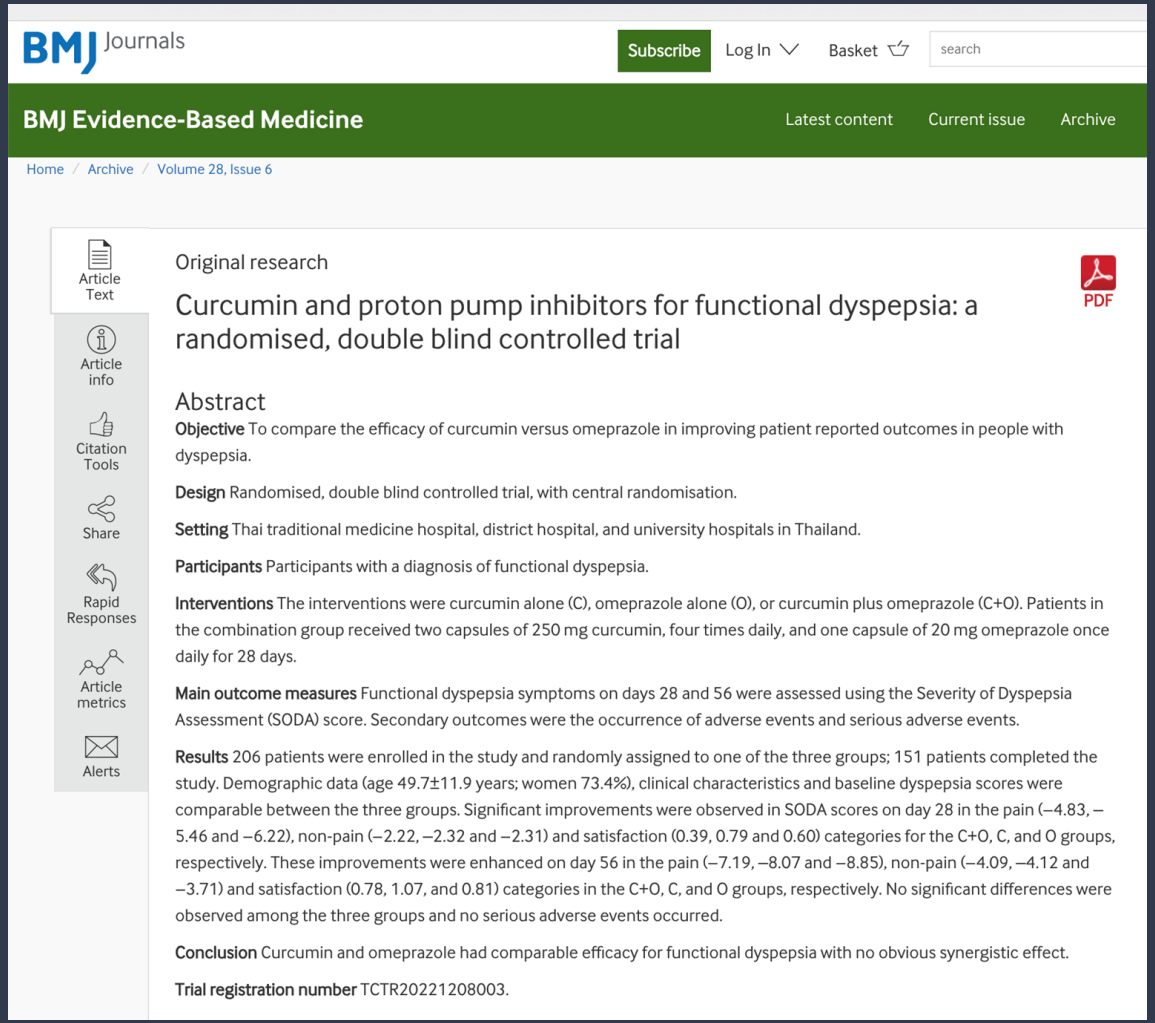
THE SOLID GOLD
CANCER
Multiple myeloma
Adenomas
Prostate
Pancreatic
Colorectal
Breast
SKIN DISORDERS
Psoriasis
Vitiligo
External Cutaneous Lesion
EYE DISORDERS
Orbital Pseudotumor
Uveitis
INFLAMMATORY CONDITIONS
Type 2 Diabetes
Ulcerative Colitis
Pancreatitis
Osteoarthritis
Rheumatoid Arthritis
Crohn's Disease
Peptic Ulcer
Oral Lichen Planus
MISCELLANEOUS
AIDS
Pain
Hepatotoxicity
B-Thalassemia
Acute Coronary Syndrome
Biliary Dyskinesia
Alzheimer's Disease
Gammopathy
Diabetic Nephropathy
Dejerine-Sottas Disease



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Curcumin and proton pump inhibitors for functional dyspepsia: a randomised, double blind controlled trial

Abstract

Objective To compare the efficacy of curcumin versus omeprazole in improving patient reported outcomes in people with dyspepsia.

Design Randomised, double blind controlled trial, with central randomisation.

Setting Thai traditional medicine hospital, district hospital, and university hospitals in Thailand.

Participants Participants with a diagnosis of functional dyspepsia.

Interventions The interventions were curcumin alone (C), omeprazole alone (O), or curcumin plus omeprazole (C+O). Patients in the combination group received two capsules of 250 mg curcumin, four times daily, and one capsule of 20 mg omeprazole once daily for 28 days.

Main outcome measures Functional dyspepsia symptoms on days 28 and 56 were assessed using the Severity of Dyspepsia Assessment (SODA) score. Secondary outcomes were the occurrence of adverse events and serious adverse events.

Results 206 patients were enrolled in the study and randomly assigned to one of the three groups; 151 patients completed the study. Demographic data (age 49.7±11.9 years; women 73.4%), clinical characteristics and baseline dyspepsia scores were comparable between the three groups. Significant improvements were observed in SODA scores on day 28 in the pain (−4.83, −5.46 and −6.22), non-pain (−2.22, −2.32 and −2.31) and satisfaction (0.39, 0.79 and 0.60) categories for the C+O, C, and O groups, respectively. These improvements were enhanced on day 56 in the pain (−7.19, −8.07 and −8.85), non-pain (−4.09, −4.12 and −3.71) and satisfaction (0.78, 1.07, and 0.81) categories in the C+O, C, and O groups, respectively. No significant differences were observed among the three groups and no serious adverse events occurred.

Conclusion Curcumin and omeprazole had comparable efficacy for functional dyspepsia with no obvious synergistic effect.

Trial registration number TCTR20221208003.

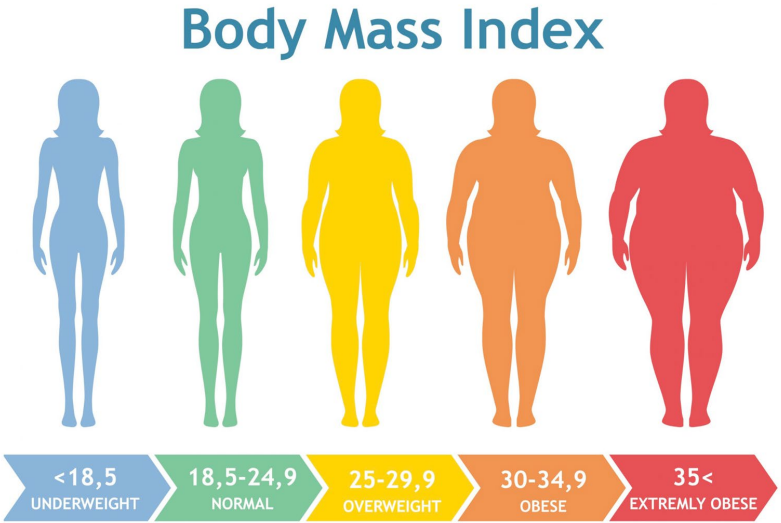
BMJ Journal

- Curcumin and omeprazole had comparable efficacy for functional dyspepsia
- Turmeric may be as good for treating indigestion as a drug to curb excess stomach acid
- This multicentre randomised controlled trial provides highly reliable evidence for the treatment of functional dyspepsia

Kongkam P, Khongkha W, Lopimpisuth C, *et al* Curcumin and proton pump inhibitors for functional dyspepsia: a randomised, double blind controlled trial BMJ *Evidence-Based Medicine* 2023;**28**:399-406

Curcumin: The Anti-Obesity Molecule

- Able to reduce the differentiation of preadipocytes, thus acting as an anti-obesity molecule.
- Curcumin suppresses angiogenesis in adipose tissue together with its effect on lipid metabolism in adipocytes may contribute to lower body fat and body weight gain.
- Increases the catabolism of lipids in adipocytes (by increasing the carnitine palmitoyltransferase 1 (CPT-1) expression involved in β-oxidation).
- Reduces the NF-κB activity and its nuclear translocation, and so it inhibits the recruitmaent of macrophages into the enlarged adipose tissue and reduces the release of IL-6, TNF-α, MCP-1 from adipocytes.



https://www.mdpi.com/2223-7747/11/13/1741

Rheumatoid Arthritis & Osteoarthritis

- Transcription factors and genes involved in inflammation and anti-oxidation are suspected to play a crucial role in RA, suggesting that the anti-inflammatory effects and antioxidant properties of curcumin can play a significant role in the treatment and prevention of RA.
- A randomized pilot study found that curcumin treatment in patients with active RA leads to the highest percentage of symptom improvement as compared to patients who were given either NSAIDs alone or a combination of NSAIDs and curcumin.
- Curcumin has similar efficacy to diclofenac but demonstrated better tolerance among patients with knee OA. Curcumin can be an alternative treatment option in the patients with knee OA who are intolerant to the side effects of non - steroidal anti-inflammatory drugs.

He Y, Yue Y, Zheng X, Zhang K, Chen S, Du Z. Curcumin, inflammation, and chronic diseases: how are they linked? Molecules. 2015 May 20;20(5):9183-213. doi: 10.3390/molecules20059183. PMID: 26007179; PMCID: PMC6272784

Shep D, Khanwelkar C, Gade P, Karad S. Safety and efficacy of curcumin versus diclofenac in knee osteoarthritis: a randomized open-label parallel-arm study. Trials. 2019 Apr 11;20(1):214. doi: 10.1186/s13063-019-3327-2. PMID: 30975196; PMCID: PMC6460672

Studies: Osteoarthritis

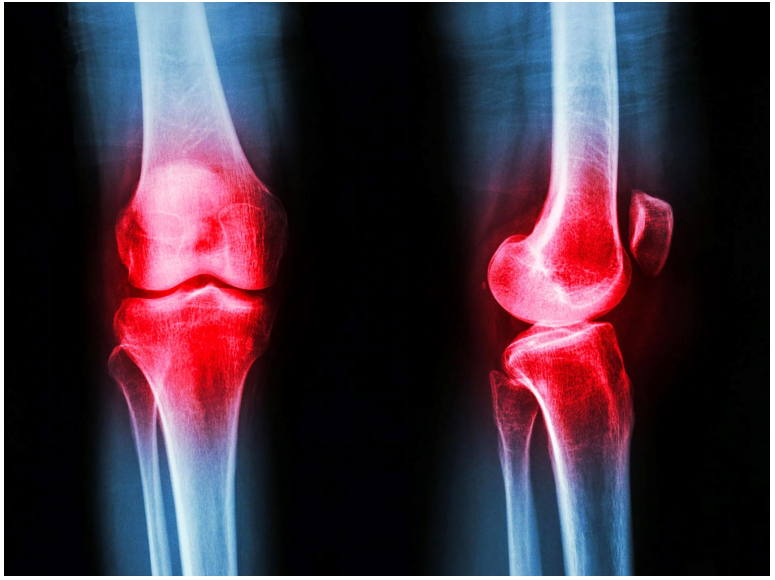
Panahi et al. (2014) study was a randomized, double-blind, placebo-controlled trial in 40 knee OA patients:

- Curcumin dramatically improved joint stiffness (measured by WOMAC stiffness subscale) by 507% compared to placebo
- It also significantly improved overall symptoms (WOMAC global score) and pain levels

Randomized controlled trial by Srivastava et al. (2016) with 160 knee OA participants:

- Curcumin provided large improvements in pain (VAS), stiffness, and physical function (measured by WOMAC subscales) at both 60 and 120 days

Another study with 50 OA patients showed curcumin significantly reduced knee pain and celecoxib dependence over eight weeks.



Panahi Y. Rahimnia AR. Sharafi M. Alishiri G. Saburi A. Sahebkar A. Curcuminoid treatment for knee osteoarthritis: a randomized double-blind placebo-controlled trial. Phytother Res. 2014 Nov;28(11):1625-31. doi: 10.1002/ptr.5174. Epub 2014 May 22. PMID: 24853120.

Srivastava. S.. Saksena. A.K.. Khattri. S. *et al. Curcuma longa* extract reduces inflammatory and oxidative stress biomarkers in osteoarthritis of knee: a four-month, double-blind, randomized, placebo-controlled trial. *Inflammopharmacol* 24, 377–388 (2016).

Studies: Osteoarthritis

The benefits of curcumin were equivalent or superior to standard NSAID therapy:

- In head-to-head trials comparing curcumin to NSAIDs like diclofenac and ibuprofen, it showed similar efficacy in improving joint pain and function
- Study Design: Randomized, open-label, parallel, active-controlled clinical study
- Participants: 139 patients with knee osteoarthritis
- Interventions:
  - Curcumin group: Curcumin 500-mg (BCM-95®) capsule three times daily
  - Diclofenac group: Diclofenac 50-mg tablet two times daily
- Duration: 28 days
- Assessment Time Points: Baseline, days 7, 14, and 28
- Results:
  - Similar improvement in severity of pain and KOOS scale observed in both curcumin and diclofenac groups at days 14 and 28.
  - Significantly greater reduction in episodes of flatulence observed in the curcumin group compared to the diclofenac group at day 7.
  - Weight-lowering effect and anti-ulcer effect observed in the curcumin group at day 28.
  - None of the patients in the curcumin group required H2 blockers, while 19 patients in the diclofenac group did.
  - Adverse effects significantly less in the curcumin group compared to the diclofenac group (13% versus 38%).

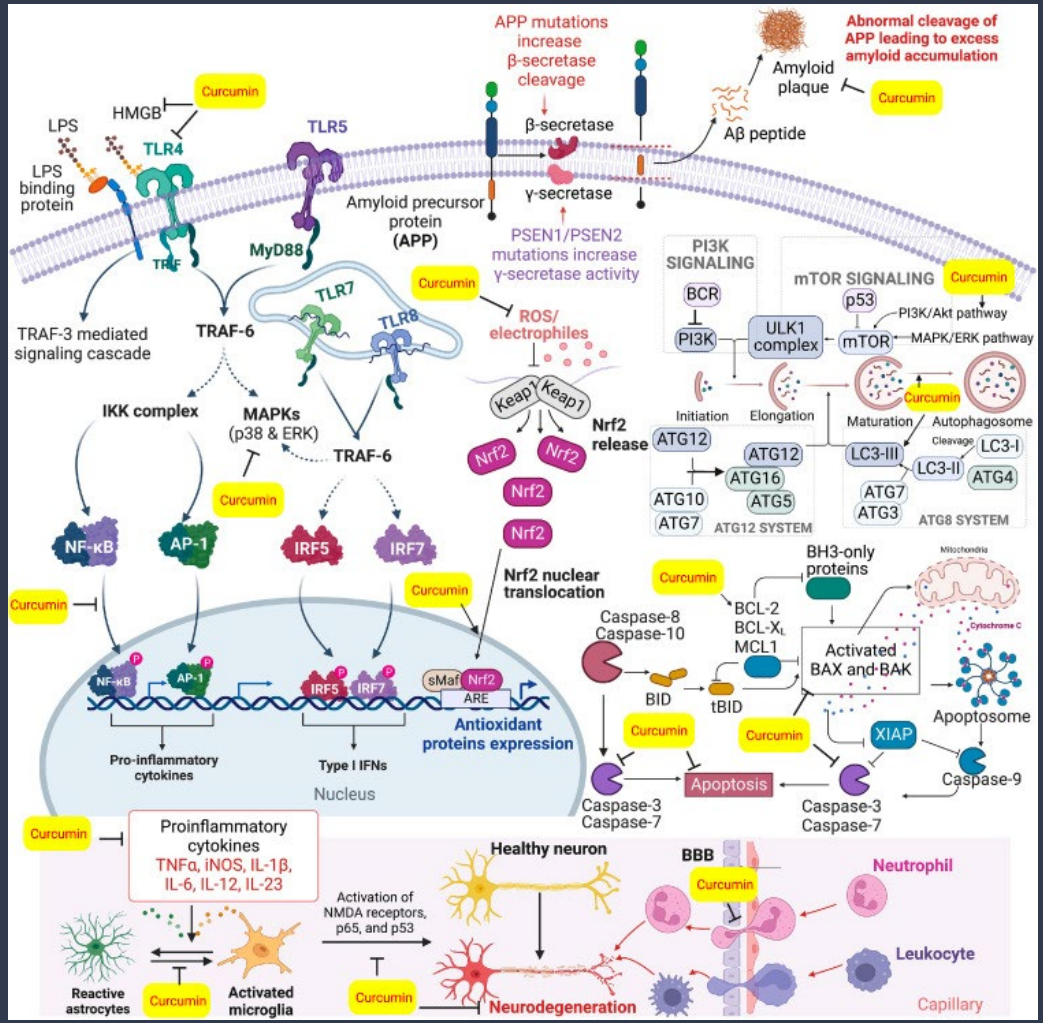
Sheo D, Khanwelkar C, Gade P, Karad S. Safety and efficacy of curcumin versus diclofenac in knee osteoarthritis: a randomized open-label parallel-arm study. Trials. 2019 Apr 11;20(1):214. doi: 10.1186/s13063-019-3327-2. PMID: 30975196; PMCID: PMC6460672.

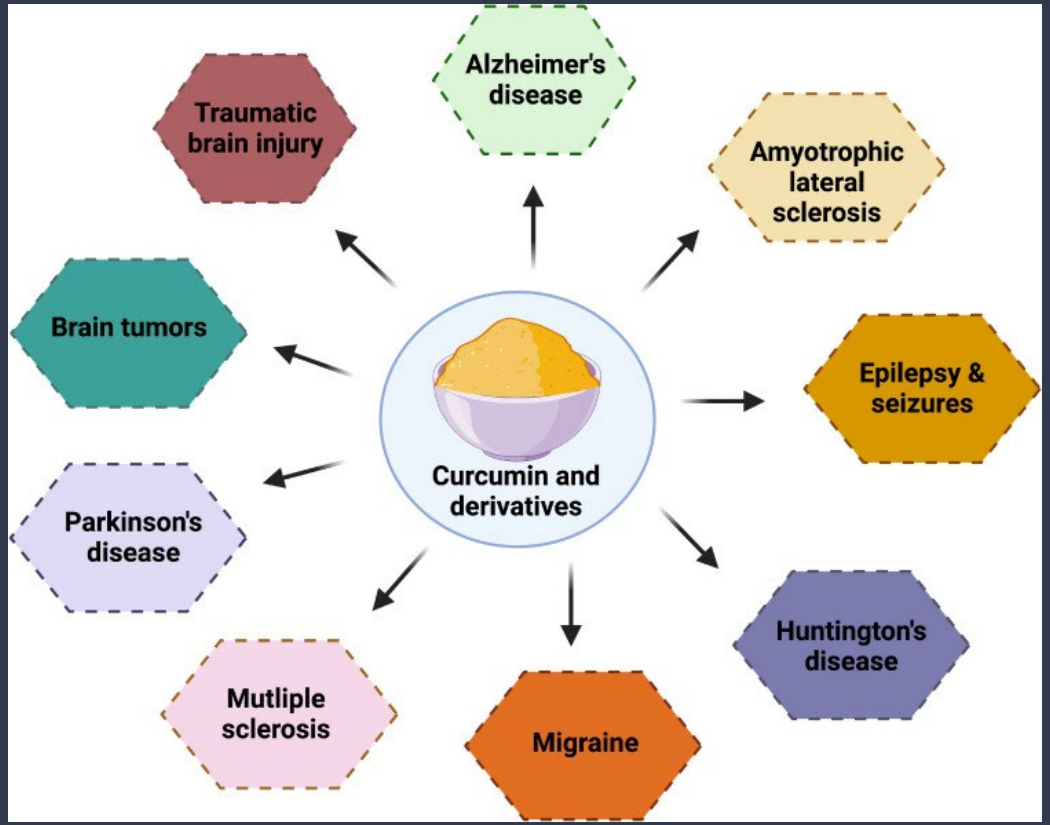
Studies: Rheumatoid Arthritis

A Novel Highly Bioavailable Curcumin Formulation Improves Symptoms and Diagnostic Indicators in Rheumatoid Arthritis Patients: A Randomized, Double - Blind, Placebo - Controlled, Two - Dose, Three - Arm, and Parallel - Group Study

- Randomized, double-blind, placebo-controlled, three-arm, parallel-group study
- Duration: 90 days
- Participants: Patients with active rheumatoid arthritis (RA)
- Treatment groups: Placebo, 250 mg, or 500 mg of curcumin daily
- Significant improvements observed in clinical symptoms compared to placebo
- Measures: American College of Rheumatology (ACR) response, visual analogue scale (VAS), Disease Activity Score 28 (DAS28)
- Both doses of curcumin well-tolerated with no significant adverse effects reported

Amalraj A, Varma K, Jacob J, Divya C, Kunnumakkara AB, Stohs SJ, Gopi S. A Novel Highly Bioavailable Curcumin Formulation Improves Symptoms and Diagnostic Indicators in Rheumatoid Arthritis Patients: A Randomized, Double-Blind, Placebo-Controlled, Two-Dose, Three-Arm, and Parallel-Group Study. J Med Food. 2017 Oct;20(10):1022-1030. doi: 10.1089/jmf.2017.3930. Epub 2017 Aug 29. PMID: 28850308.


APP mutations increase β-secretase cleavage
Abnormal cleavage of APP leading to excess amyloid accumulation
Amyloid plaque
Curcumin
HMGB
LPS
TLR4
LPS binding protein
TLR5
β-secretase
γ-secretase
Aβ peptide
Amyloid precursor protein (APP)
PSEN1/PSEN2 mutations increase γ-secretase activity
MyD88
TRIF
TRAF-3 mediated signaling cascade
TRAF-6
TLR7
TLR8
ROS/ electrophiles
Keap1
Nrf2
Nrf2 release
Nrf2 nuclear translocation
PI3K SIGNALING
BCR
PI3K
ULK1 complex
mTOR SIGNALING
p53
mTOR
PI3K/Akt pathway
MAPK/ERK pathway
Initiation
Elongation
Maturation
Autophagosome
Cleavage
ATG12
ATG16
ATG5
ATG10
ATG7
ATG12 SYSTEM
LC3-III
LC3-II
LC3-I
ATG4
ATG3
ATG8 SYSTEM
IKK complex
MAPKs (p38 & ERK)
NF-κB
AP-1
IRF5
IRF7
sMaf
ARE
Antioxidant proteins expression
Pro-inflammatory cytokines
Type I IFNs
Nucleus
BH3-only proteins
BCL-2
BCL-XL
MCL1
Activated BAX and BAK
Mitochondria
Cytochrome C
Apoptosome
Caspase-8
Caspase-10
BID
tBID
XIAP
Caspase-9
Caspase-3
Caspase-7
Apoptosis
Proinflammatory cytokines
TNFα, iNOS, IL-1β, IL-6, IL-12, IL-23
Reactive astrocytes
Activated microglia
Activation of NMDA receptors, p65, and p53
Healthy neuron
Neurodegeneration
BBB
Neutrophil
Leukocyte
Capillary



Curcumin, inflammation, and neurological disorders: How are they linked?

In particular, *in vitro*, *in vivo*, and clinical studies focusing at the effects of curcumin on NDs revealed that curcumin modulates important signalling pathways and molecules that regulate neuroinflammation. For example, curcumin and its derivatives have been found to regulate Akt/mTOR pathway, NF-κB pathway, β-catenin pathway, NLRP3 inflammasome pathway, BDNF/TrkB pathway, Nrf2, IL-6/STAT3 inflammatory pathways and DNA repair pathways.

https://doi.org/10.1016/j.imr.2023.100968

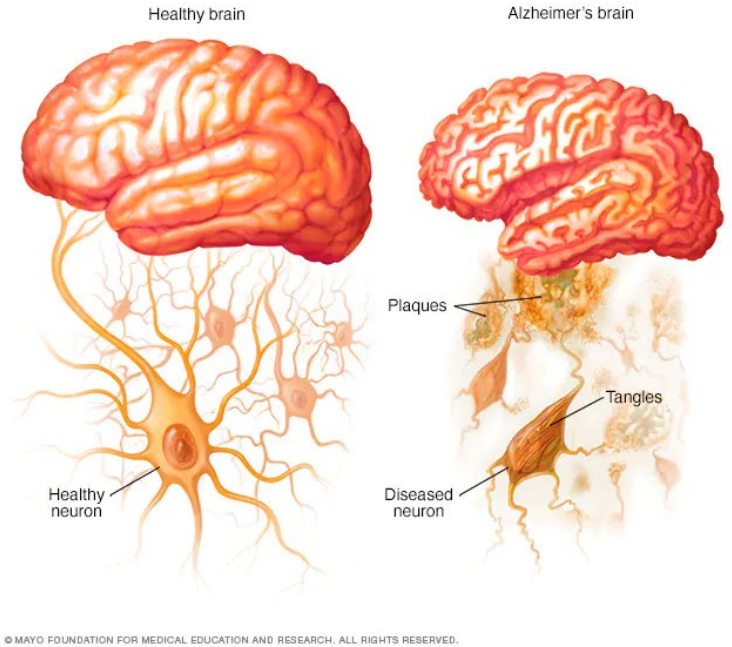
Curcumin's Numerous Benefits on Alzheimer's

- Reduced Aβ plaques and tau tangles, two key pathological hallmarks of Alzheimer's disease (Frautschy et al., 2001; Ma et al., 2013; Sundaram et al., 2017; Yanagisawa et al., 2015)
- Exerted neuroprotective effects by reducing neuroinflammation and oxidative stress (Agrawal et al., 2010; Bassani et al., 2017; Hoppe et al., 2013)
- Enhanced neurogenesis and synaptic plasticity (Wang et al., 2013a; Wang et al., 2013b; Nam et al., 2014)
- Curcumin has anti-inflammatory and antioxidant properties that may help treat Alzheimer's disease pathology. "As oxidative stress [3] and inflammation [4] are potentially involved in propagating AD pathology, the utility of curcumin in treating and preventing AD is being pursued [5]." (Ringman et al.)
- Curcumin can bind to beta-amyloid plaques in the brain. "Curcumin has a biphenolic structure similar to Congo Red and binds to amyloid plaques in vivo [6]." (Ringman et al.)

Curcumin in Alzheimer’s Disease

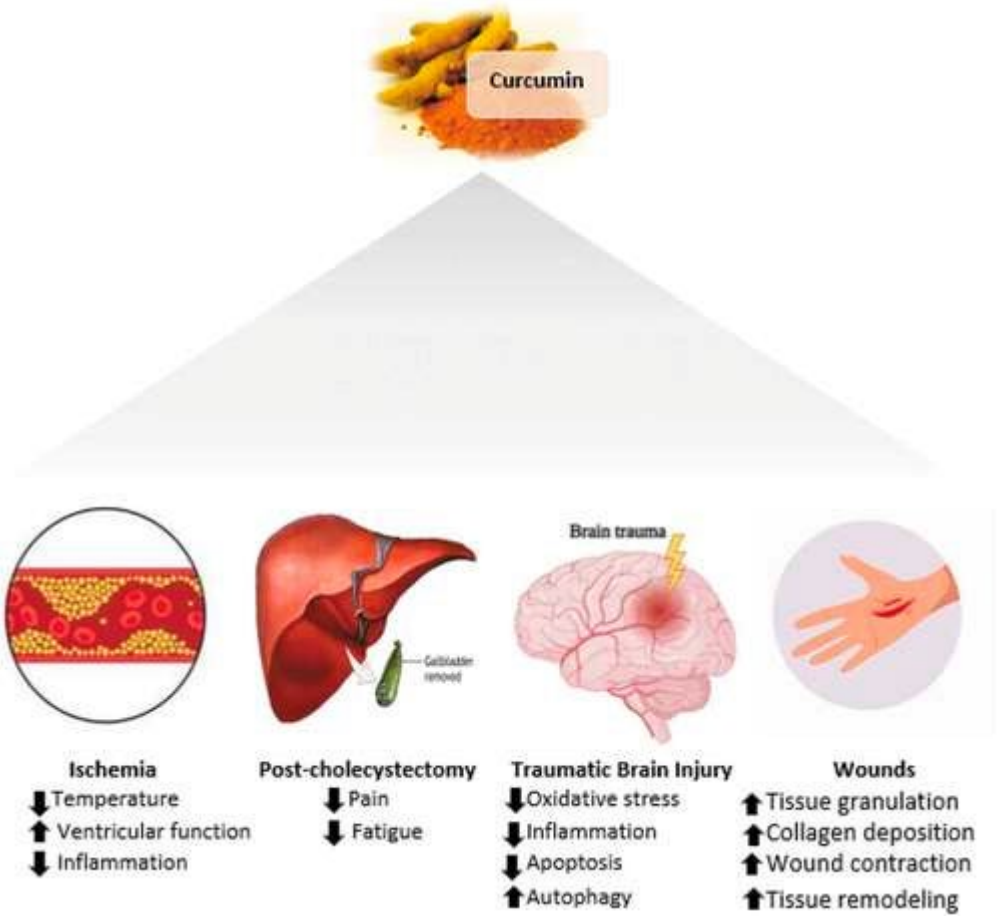
A study by UCLA researchers examined the effects of a bioavailable curcumin supplement on memory and mood in people with mild age -related memory complaints:

- 40 adults between 50-90 years old with mild memory complaints were given either 90 mg of curcumin or placebo twice daily for 18 months (double-blind, placebo-controlled trial)
- Those taking curcumin showed significant improvements in memory and attention compared to placebo after 18 months (28% improvement on memory tests)
    - Curcumin group also had mild improvements in mood
- PET scans revealed those taking curcumin had less amyloid and
- tau accumulation in brain regions related to memory and emotion (amygdala, hypothalamus) compared to placebo
- Curcumin was well-tolerated with only mild side effects (abdominal pain, nausea) reported in a few subjects
    - Researchers concluded curcumin may provide meaningful cognitive benefits over time and reduces Alzheimer's disease pathology based on PET scan results



https://pubmed.ncbi.nlm.nih.gov/29246725/

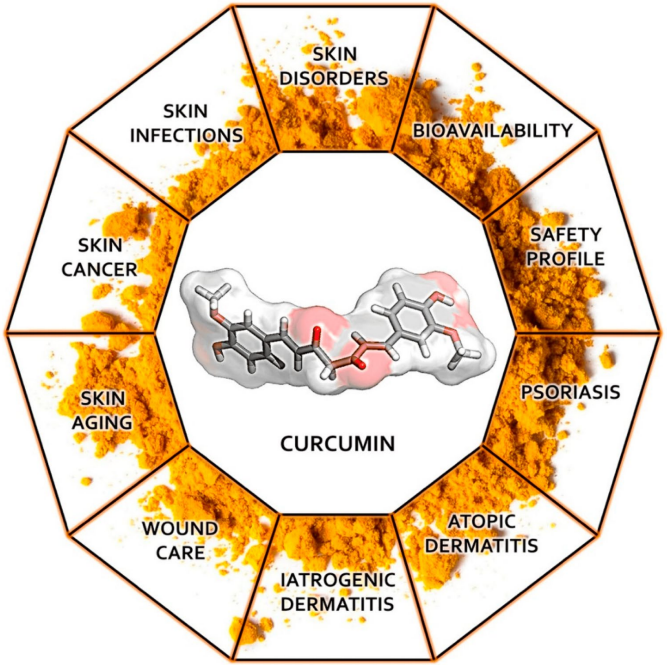
The Therapeutic Role of Curcumin in Inflammation and Post-Surgical Outcomes



https://www.tandfonline.com/doi/full/10.1080/87559129.2023.2166525

Curcumin: Significant wound healing properties

- Activates/hastens various stages of wound healing
- Discourages bacterial infection of wound tissue
- Decreases body's response to inflammation and oxidation
- Stimulates cell proliferation in damaged tissue in cutaneous wounds



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Curcumin Contraindications

- Surgery: Turmeric might slow blood clotting. It might cause extra bleeding during and after surgery. Stop using turmeric at least 2 weeks before a scheduled surgery.
- Gallbladder problems: Turmeric can worsen gallbladder problems because of its ability to increase bile secretion. People should avoid using turmeric supplements if they have gallstones or bile duct obstruction.
- Iron deficiency: High amounts of turmeric may interfere with iron absorption in the body. Therefore, people with iron deficiency should use turmeric cautiously.
- Gastroesophageal reflux disorder: Turmeric can worsen stomach problems such as GERD. People with GERD should monitor for exacerbation of symptoms while having turmeric.
- Diabetes: Curcumin, a chemical present in turmeric, might reduce blood sugar levels in people with diabetes.

In Conclusion …

Curcumin can be a viable support for multiple inflammatory conditions as well as disease prevention due to its properties.

For questions or comments please reach out to me:

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