PHARMACOLOGICAL ACTIVITIES OF ZINGIBER OFFICINALE (GINGER): A REVIEW

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ABSTRACT

Ginger is a medicinal plant extensively employed in Chinese, Ayurvedic and Tibb-Unani herbal medicine around the world and has a lengthy traditional history of use in a series of herbal remedies. The main agents of Acrid are due to the appearance of phenylalkylketones or vanillyl ketones. Gingerol and shogaol are the top features of ginger-based preparations. They have been displayed to be anti-inflammatory, antipyretic, antiarthritic, and anti-inflammatory. Ginger, the rhizome of the Zingiber officinale, is one of the most extensively used species in the ginger family (Zingiberaceae) and the common Flavoring of different foods and beverages. Zingerone is not in pure ginger but cooking or heating converts gingerol into zingerone. Zingerone is concerned to vanillin from vanilla and eugenol from cloves. Zingerone has strong anti-inflammatory properties, antidiabetic, antilipolytic, anti diarrhoeic, and antispasmodic, and so on. Demonstrates the property of improving growth and promoting the immune system. It acts as a stimulating anxiolytic, antithrombotic, radiation protection, and antimicrobial. inhibits the active nitrogen species that are very useful causing Alzheimer's disease and other diseases. The medicinal features of zingerone and its role in alleviating many human animal diseases. The current treatments and modes depend on synthetic drugs are important and also differentiate genes and physiology. However, safe and effective treatment is needed to monitor disease improvement.
and progression. In this medicinal plant and its properties play an important role in the management of disease through the variability of biological functions?

KEYWORDS: Herbs, Management, Treatment, Genetics, Motivation, Flexibility, Metabolic, Control, Reduction, Culture.

INTRODUCTION
Ginger (Zingiber officinale Roscoe) evolved in South-East Asia and is a very common spice, used worldwide. It is a powerful, fragrant spice that adds special flavor and taste to our food.[1] Ginger is an underground worm of a ginger plant. These perennial vegetables have grown as a spice and spice. Besides, it is used to give off a delicious aroma in Indian food. Herbal remedies and its important properties are of great value in the diet and treatment of many diseases and the Prophet Mohammed (PBUH) used many herbs adding dates and Nigella sativa and recommended different medicinal plants in the treatment of diseases.[2,3] Medicinal plants and their important properties show important effect in treating diseases especially having antioxidant, anti-inflammatory, antidiabetic and anti-tumor effect. Ginger, the rhizome of Zingiber officinale is generally used for food particles that are considered safe and used to treat many ailments.[4] It also plays important role in dysfunctional cancer-regulating cancer cell activation.[5]

Description of Plants
Ginger is the only long-lived herbaceous rhizomatous, prolonged to 90 cm in height under planting. Rhizomes are fragrant, thick, light yellow, and suffer from lanceolate leaves.[6] The leaves are short and 2 - 3 cm wide with sheathing bases, the blade moves slowly. Individual inflorescences, radial oblongcylindrical radial lateral rivets. The flowers are unusual, rather small, high in calyx, gamosepalous, with three teeth; an open crack on the other hand, a corolla of three equal oblong subdivisions to be divided into green parts (I-Kawai, 1994).[7,8] In this review, we take the Therapeutics effect of ginger on disease management by modifying biological functions including anti-inflammatory and anti-oxidative activities as well as gene expression management.[9]

Active elements of Gingers
The ingredient’s of ginger are varied and varied depending on the region of origin and whether the rhizomes are clean or dry but to summarize the major components included in the therapeutic activities of the raw material.[10] The principal agents of ginger are gingerol,
and other gingerols such as shogoals, paradol and zingerone are also find in high levels in the rhizome. The main function of ginger medicine is due to gingerol and shogaol (Duke and Beckstrom 1999). \[11\] Phenylalkylketones ginger contains 6-gingerol 8- gingerol and 10-gingerol, 6-shogaol, 8shogaol, 10-shogaol and zingerone. 6-paradol, 6- 10-dehydrogingerdione and 6- 10-gingerdione have been identified. \[12,13\]

**PHARMACOLOGICAL ACTIVITY OF GINGER**

**Antioxidant activity**

Antioxidants are substances that play an important role in reducing free radicals and oxidative stress. Free production is measured by our body's antioxidant protective system. \[14\] Any mutation between the creation of active oxygen (ROS) and its ineffectiveness in saving antioxidant causes oxidative stress. Several plants and their important properties are a main source of antioxidants and play a vital role in preventing the progression of diseases. Ginger is a origin of a large number of antioxidants and also plays an vital role in reducing lipid oxidation and preventing infectious diseases. \[15,16\] Previous studies have showed that ginger extract has antioxidative properties that have been shown to play a important role in eradicating superoxide anion and hydroxyl radicals as well as gingerol, ascorbate/ferrous complex produced by lipid peroxidation in liver microsomes. Oil and -oleoresin needed for Zingiber officinale has shown significant antioxidant activity in anti-bacterial activities. 6-Dehydroshogaol, 6-shogaol and 1-dehydro-6-gingerdione have shown strong inhibition of nitric oxide (NO) synthesis in rouse macrophages. \[17\] One report favoring ginger as an antioxidant has shown that 6-shogaol has a powerful antioxidant properties that can be repaired where unused ketone moiety is found. Other studies have find that phenolic substances have strong anti-inflammatory and antioxidative properties and have many anticarcinogenic, antimutagenic activities and have shown an important role such as deactivating H2O2, which donates electrons to H2O2, thus reducing them in water. An later report showed that the antioxidative action of ginger extract in an animal model. \[18,19\]

**Anti-inflammatory activity**

Ginger has a brief history of use as an anti-inflammatory and most of its active ingredients have been founded as having anti-inflammatory properties. \[20\] Ginger has been showed to have biosynthesis and prevention of inflammatory prostaglandin and Cascade inflammation and vanilloid nociceptor12. Ginger is indicated on the drug sites with non-inflammatory drugs (NSAIDs) because it covers the combination of prostaglandin by inhibiting
cyclooxygenase-1 and cyclooxygenase-2. Ginger can be exposed to NSAIDs depending on its power to suppress leukotriene biosynthesis by prohibiting 5-lipoxygenase. These findings predict that two cyclooxygenase and 5-lipoxygenase inhibitors may have a good therapeutic profile and have some side effects than NSAIDs. It has also been observed that ginger extraction based on Zingiber officinale (and Alpina galanga) prohibits the production of several genes added in the inflammatory response, adding genes including cytokines, chemokines, and the enueme enzyme cyclooxygenase-2.\(^{[21,22]}\) This exhibition proof the first evidence that ginger modulates biochemical mechanisms underlying chronic inflammation. Observing the cellular targets of the ingredients of ginger provides an opportunity to increase and evaluate ginger products in relation to their effects on inflammatory biomarkers.\(^{[23]}\)

**Anti-tumor activity**

The development and progression of Tumor is a multi-step procedure that enhances genetic and physiological changes. Previous research has reduced the role of medicinal plants in disease management through the exchange of various natural functions including cancer.\(^{[24]}\) Ginger and its active properties show an important effect on controlling tumor growth through high genetic control of tumor suppression, apoptosis formation and VEGF pathway.\(^{[25]}\) Angiogenic factor such as VEGF plays a vital role in plant development and progression. Therefore, VEGF inhibition is an important step in inhibiting plant growth.\(^{[26,27]}\) Preliminary protections have shown that 6-gingerol plays an important role in reversible stress, hyperproliferation, and inflammatory processes involved in various stages of carcinogenesis, angiogenesis and metastasis.\(^{[28]}\) Several other studies have founded that 6-gingerol, is active components. Ginger contributes to the fetching of apoptosis in the cervical cancer line LnCaP by not decreasing the expression of p53 and Bax and reducing the expression of Bcl-2. Other studies have been showed that 6-shogaol exhibits anticancer activities against breast cancer by inhibiting the reduction of cell invasion of matrix metalloproteinase-9 expression. Other important findings suggest that 6-gingerol excites apoptosis through NAG-1 regulation and the G1 cell cycle binding to cyclin D1 registry. Home studies have reported that the extraction of ginger and gingerol roots plays a major role in inhibiting the swelling of Helicobacter pylori CagA + species, which have certain genes associated with the improvement of dominant and malignant gastric ulcers. In addition, 6-shogaol has been founded to induce apoptosis in human colorectal carcinoma cells through the production of active and activating oxygen species. caspase and [6] -gingerol inhibited lung metastasis in mice carrying melanoma B16F10 cells through the activity of CD8 + T
cells. By activating p53 and cell cycle binding and n e-apoptosis. An important and early findings have shown that in vitro and in vivo anticancer activity for all GE prostate cancer treatments.

**Anti diabetic activity**

Diabetes is a metabolic diseases and a major health problem worldwide. It is caused by abnormal carbohydrate metabolism linked to low raise of blood insulin or insulin-resistant organs. With each test, one person traces diabetes every five seconds in the world and another dies every ten seconds. Ginger and its ingredients show an vital role in controlling diabetes and its complexity with anti-hyperglycemic effect. The proper mechanism of action of ginger in diabetes management is not fully understood but may be remaining to the inhibition of oxidative stress and the anti-inflammatory process. The most important findings based on the type of diabetes-related STZ reported that, oral administration of ginger extract did not increase blood glucose levels. Previous studies have reported that low blood glucose levels reduce the activity of ginger juice in diabetic and non-diabetic animals. Other studies have shown significant hyperglycemic activity in mice after administration of ginger extract.

**Antiemetic activity**

Ginger and its active properties show a significant effect on purification and purification. The specific mechanism of action of ginger in nausea and vomiting is unclear but it is thought that the type of effect is due to the active ingredients present in ginger including ginger, shogaols, galanolactone and the diterpenoid ginger. Studies based on animal models have shown that ginger gisthas antiserotonergic and 5-HT3 antagonistic effects that play an important role in the etiology of postoperative nausea and vomiting. A study in favor of the role of ginger in nausea and vomiting shows its effect and provided relief from the severity of nausea, vomiting.

**Antimicrobial activity**

Drug resistance is increasing worldwide and is considered as main causes of treatment failure. The use of antibiotics / microorganisms is an effective treatment but also causes undesirable confusion. Researchers have previously shown that ginger and its ingredients play an important role in preventing bacterial growth or acting as antimicrobial agents. Important research on ginger foundations as an antimicrobial activity has found that ginger has antibacterial activity against E coli, Salmonella typhi Bacillus subtilis and ethanolic
extract of ginger has found a broader area of Salmonella typhi inhibition. Gingerol and shagelol have been identified as active agents. Eliminary studies have shown that, ginger has a broad antibacterial activity and ethanolic release of powder of ginger has announced anti-Candida albicans and other reports and has shown that the properties of -ginger that does not prevent release, Gingerol. The main active ingredients such as gingerol and shagelol, isolated from the ginger rhizome, have shown antibacterial activity against periodontal bacteria and -gingerol has been reported as an inactive inhibitor of M. M. Avium, M. Tuberculosis in vitro.37

**Gastroprotective Effect**

The ulcer of peptic is a major worldwide problem for both sexes. Different factors including dietary supplements, depression, Helicobacter pylori and drugs deal with stomach ulcers. Many medicinal plants and active ingredients show an anti-wound effect in different ways but the exact method is not fully understood. Ginger and its properties play a vital role in protecting wounds by not reducing mucin secretion. Previous findings have shown anti-ginger effects on gastric ulcer models. The main ingredients of ginger such as gingerol and shogaol suppressed gastric emptying and the pressure of shogaol was very severe.38,39

**Radio Protective activity**

In vitro, pre-treatment with gingerol reduced effective UVB oxygen levels by active molecules, improved caspase3, -8, -9, and Fas performance. It also reduced UVB exposure and COX-2 (40) exposure. Transfer NF-κB from cytosol to nucleus in HaCaT cells was mediated by gingerol by suppressing I VerBα phosphorylation (ser-32). Studies by EMSAs and immunohistochemistry have found that the topical use of gingerol (30 μM) before UVB irradiation (5 kJ / m2) of hairless mice, also prohibits the production of COX-2 mRNA and protein, and NF-κB migration.41,42

**Antigenotoxic activity**

Norethandrolone and oxandrolone are enhanced by their genotoxic effect on human lymphocyte chromosomes by using chromosomal collapse and sister switch as a parameter and later Genistein and gingerol were used as antigenotoxic agents to enhance genotoxicity.43 Norethandrolone and oxandrolone are studied at 5, 10, 20, 30 and 40 μM, respectively and are shown to have significant genotoxicity at 30 and 40 μM. Genistein and...
[6] gingerol have been founded to be effective in reducing genotoxic damage by appropriate doses.[44]

**Ginger effect on the eye**

Ginger and its active ingredients play an important role in the management of diabetes and its symptoms including retinopathy.[45] An earlier report founded that 0.1 and 1.0 mg / mL ginger extract was reduced and reduced CML-KLH products and glycation end (MGE) products made with MGO by 60% -80 and AGE products glucoed by 50% -60%.[46,47]

**Neuroprotective effects**

Ginger and their active constituent’s play an vital role as a neuroprotector. The specific mechanism of action of ginger in this vista is unknown. However, it is thought that ginger gets a neuroprotector effect due to the chemical phenolic and flavonoids.[48] Important research has found that, 6-shogaol has anti-inflammatory effects to prevent temporary global ischemia by blocking microglia. Another finding in ginger support as the neuroprotector suggests is that it inhibits neuroprotective activity by accelerating anti-oxidant brain defense mechanisms and regulating MDA levels in normal levels in diabetic rats. A current report on ginger juice founded that, ginger has a protective effect by not increasing LPO and not reducing GSH, SOD, CAT, GPx, GST, GR, QR and protein levels in portable mice.[49,50]

**CONCLUSIONS**

Current therapies depends on synthetic drugs such as anti-inflammatory, anti-diabetic, chemotherapy, radiotherapy drug treatment are effective but also have side effects. A safe, effective and common product is necessary to control disease progression through genetic, metabolic, anti-oxidant and other related functions. Ginger exhibits significant effects on NFkB, COX2, and LOX suppression, apoptosis formation, genetic tumor suppressor function and also alter different biological functions. Ginger and their active constituents create hope in the novel’s therapeutic plan. Future research should focus on clinical trials to explore its effectiveness and its vital role in transforming roads.

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