

Ginger and turmeric: history and use



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Ginger and Turmeric

Introduction

Ginger

Ginger and turmeric are categorized in the same family, Zingiberaceae, along with cardamom (White 2007)(Leal 2003). The most frequently used herbal supplement is *Zingiber officinale*, which is the scientific name for ginger (White 2007). The scientific name of ginger, *Zingiber officinale*, was created by Linnaeus a Swedish botanist from the 18th century. Linnaeus named ginger after Singabera, or shaped like a horn, which is an Indian Sanskrit (Hoffman, 2007). Ginger is known for its overpowering smell and taste and also for its medical use to reduce nausea (White 2007). The well-known aroma of ginger is from the ketones, one of these ketones is gingerol (White 2007). The strong taste that ginger possesses is from phenylpropanoids, non-pungent fats and waxes (Hoffman 2007). Ginger's taste is known when its hydrocarbon tails unite with its receptors (Hoffman 2007). Gingerols and zingerone are the non-volatile phenylpropanoids that contribute to ginger's taste (Hoffman 2007). The dehydrated form of these molecules are gingerols and shogals which has a lot stronger taste (Hoffman 2007). The rhizome, which is a stem, is normally consumed but is referred to as the "ginger root" (White 2007). Ginger can be consumed in many forms of which are as juice, dry powder, syrup or even in pill form for easy digestion (Hoffman 2007). Fresh ginger does not contain zingerone but once cooked the zesty sweet flavor of zingerone appears from gingerol converting into zingerone (Hoffman 2007).

Turmeric

Curcuma longa, or turmeric, is known for being an Indian spice (Jurenka 2009). Turmeric is located in South Asia, Southwest Asia, China, the

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Caribbean Island and South America (Leal et al., 2003). Turmeric is known for the particular reign of Asia and the Middle Eastern countries (Tayyem et al., 2006). In India, the average consumption of turmeric is around 2 to 2.5 grams, this means that the consumption of curcumin is anywhere from 60 to 100 mg a day (Chainani-Wu 2003). Turmeric is used in foods for its yellow color and flavor (Leal et al., 2003). Turmeric has been used in laxatives and as a pesticide (Negi et al., 1999). In 1910, Lampe and Milobedzka, discovered what made the famous yellow color in turmeric, which is curcumin (Jurenka 2009). Medically turmeric is known for its anti-oxidant, anti-cancer, antimutagenic and anti-inflammatory activities (Leal et al., 2003). When curcumin is taken by mouth it has a low bioavailability (Tayyem et al., 2006). Turmeric has many effects on the DNA by inhibiting the destruction, lowering the mutations and helping repair DNA (Krishnaswamy 2007). It was also shown that the level of detoxifying enzymes increase with the amount of turmeric (Krishnaswamy 2007). Turmeric is indigenous to the tropical region of South and Southeast Asia (Krishnaswamy 2007). The way that turmeric is used in food in India is that it is fried or it is boiled and at these elevated temperature this still did not affect turmeric's ability to prevent mutants (Krishnaswamy 2007).

Historical Usage

Ginger

Ginger has been historically used for colds, fevers, digestive problems and to increase the appetite (White 2007). Ginger has been referred to in the ancient passages in countries like China, Ancient Rome, India, Arabia and Greece (Olgoli et al., 2009). Ginger has been utilized in numerous ways because of its aroma and also in culinary ways by adding it to jams, drinks, <https://assignbuster.com/ginger-and-turmeric-history-and-use/>

bread and sweets (Olgoli et al., 2009). Ginger has been used for diarrhea, gastritis, and nausea for thousands of years in Asian medicine (Olgoli et al., 2009). In China and Thai ginger has been used in controlling nausea and vomiting in pregnant women (Olgoli et al., 2009). For thousands of years, ginger has been used for medical purposes as well as a culinary spice added to food for its color and flavor (Hoffman 2007). Ginger has been discussed in many ancient Indian, Arab, Chinese, Greek and Roman medical texts on the medical use of it and was referred to as the universal medicine in India (Hoffman 2007). Ginger has been used for problems related to the respiratory and digestive tracts as well as a tonic for the heart and a paste to help with headaches and aching joints due to arthritis (Hoffman 2007). The gastrointestinal tract has been benefited a great deal from ginger by inhibiting gastric ulcers, increasing digestion enzymes, and improving the secretion of bile (Chen et al., 2007).

There is a wild ginger located in Hawaii that is used for cuts, bruises, sores, fungal skin infections, painful joints, sprains, headaches, stomachaches and toothaches (Hoffman 2007).

Turmeric

Turmeric was used as a treatment for diseases related to inflammation in Ayurvedic medicine (Jurenka 2009). Turmeric was used historically in Indian medicine for rheumatic disorders, gastrointestinal disorders, for wound healing and even for removing worms from people and animals to cosmetics (Krishnaswamy 2007). Turmeric in paste form has been used on chicken pox, small pox, and measles (Krishnaswamy 2007). In India there is land that is set aside for the growth of spices and condiments; 60 percent of

that land is used for the growth of turmeric (Krishnaswamy 2007). For religious ritual turmeric has been used as dyes for not only fabric but also used on the skin (Funk et al., 2006).

Bioactive Ingredient

Ginger

Two bioactive ingredients of ginger are shogaols and gingerols which act like antioxidants (Leal et al., 2003). There are additional compounds in ginger extract that stop the growing of microorganisms and effect the growth of specifically *Mycobacterium tuberculosis* and *Mycobacterium avium* (Leal et al., 2003). Another bioactive ingredient of ginger is zingerone, it helps with the prevention of diarrhea due to pathogens (Chen, 2007). The bioactive ingredients of ginger, that make ginger known for its function of being an: antioxidant, anti-angiogenesis, anti-cancer, anti-atherosclerotic, and anti inflammatory are gingerol, shogoal, and paradol (Hanim et al., 2008). The way these molecules are able to posses all of these properties is by reducing the number activity of nuclear factor-kappa B. Nuclear factor-kappa B is important in the ability for the cell to multiply and form new blood vessels. When nuclear factor-kappa B inhibited it hinders the formation of new blood vessels and the cells ability to rapidly multiply (Hanim et al., 2008). Saponins, alkaloids, and flavonoids are all found in ginger (Ghayur & Gilani, 2005).

(Hoffman 2007)

Tumeric

Curcuminoids are a bioactive ingredient in turmeric that has antioxidant properties (Leal et al., 2003). In a reaction that requires polykedtide

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synthase, two p-coumaroyl-CoA molecules are joined together with a malonyl-CoA molecule to release a water molecule and form curcuminoids (Ramirez-Ahumada et al., 2006). There are three types of curcuminoids, they are curcumin, demethoxycurcumin, and bisdemthoycurcumin (Jurenka 2009). Turmeric has the largest amount of curcumin compared to other spices; turmeric is 3. 14 percent curcumin and can be up to 9 percent curcuminoids (Tayyem et al., 2006)(Krishnaswamy 2007). The carbonyl group in curcumin has been related to how turmeric may help with preventing cancer (Leal et al., 2003). Curcumin is virtually water insoluble because it's a lipophilic polyphenol molecule (Jurenka 2009). In addition, curcumin can survive the acidic content of the stomach (Jurenka 2009). Another important group of ingredients in turmeric are the volatile oils; rumerone, zingiberone, and atlantone (Jurenka 2009).

(Ahmed & Gilani, 2008)

Modern Use

Ginger Related to Nausea, Vomiting, and Diarrhea

The way that ginger prevents vomiting is not a known mechanism (White 2007). But what is considered is that ginger stops the binding of serotonin receptors and has an effect on the gastrointestinal system along with the central nervous system to prevent vomiting (White 2007). Ginger has shown to have a positive effect on reducing nausea and vomiting related to both pregnancy and post operation (White 2007). Pregnant women taking ginger by capsule have shown to experience positive results by having a decrease in nausea and vomiting (Ozgoli et al., 2009). Women who are pregnant and experiencing nausea and vomiting should take 250 mg of ginger four times a

day (White 2007). In China, United Kingdom, and Thailand ginger is listed on the pharmacopeias list for being an important drug for pregnant women because of its ability to decrease nausea and vomiting (Ozgoli et al., 2009). In a study with pregnant women, 77 percent of the women had a major improvement in the severity of nausea and 67 percent had a decrease in frequency of vomiting when using ginger syrup (Ozgoli et al, 2009). When ginger is taken by either capsule or syrup there was a positive result in reducing nausea (Ozgoli et al., 2009).

Levine et al. found that nausea was slowed down during chemotherapy treatments when ginger was combined with protein (Levine et al., 2008). In a recent study done by Chen et al., they found an additional benefit to ginger, that it prevents diarrhea (Chen et al, 2007). The way ginger stop diarrhea is by inhibiting the B subunit of heat-labile enterotoxin from attaching to the ganglioside GM1 (Chen et al., 2007).

Ginger and Arthritis

There are varied views on whether ginger has any effect on relieving pain from arthritis (White 2007). There was a study that showed a significant difference in reducing arthritis symptoms in the knee with the uses of ginger extract but another study said that it may only be in the first phase of treatment that symptoms are reduced (White 2007). Patients taking ginger in the powder form have noticed a decrease in swelling and pain (White 2007). There has not been much research on the use of ginger rubbing oil but it is an option to ease the pain from inflamed joints (White 2007). In a study performed on rats, the subjects were injected with polyarthritis which is like redness and irritation to the skin, rheumatoid arthritis, and

osteoarthritis and each rat's knee was measured before inflammation (Levy et al., 2006). One group of rats was given 6.2 mg/kg of 6-shogaol per a day, this group had much lower amount of swelling in the knee compared to the control group (Levy et al., 2006). After twenty-eight days of the trial, the swelling of the 6-shogaol group was almost as low as the circumference of the knee measurement before the trial began (Levy et al., 2006). The way that 6-shogaol reduced the inflammation was by keeping monocytes, macrophages, leukocyte, and lymphocytes in the blood and inhibiting the movement of them into the synovial cavity (Levy et al., 2006).

Ginger and Heart Disease

One of ginger's known properties is effect on cholesterol, which is known as hypocholesterolemic, having low total cholesterol and low density lipoprotein are two important components in reduce risk for heart disease (Al-Amin et al., 2006). Ginger may lower the risk of heart disease by lowering cholesterol and thinning the blood to prevent clots from forming (Hoffman 2007). In a study performed on rats, when taking ginger daily the blood cholesterol of the rats was reduced but had an inverse affect on blood sugar by increasing it in the rats (Srinivasan 2005) High blood pressure is another risk factor in having an increase risk for heart disease. The ginger root has been shown in studies using rats to be lower high blood pressure but there are very few studies done with humans (Chen et al., 2009). The two ingredient of ginger that has a lower effect of blood pressure are 6-shogaol and 6-gingerol but the mechanism of how they do it is unknown (Chen et al., 2009). When rats were given ginger there was a 44 percent decrease in blood cholesterol levels. After seven weeks of ginger treatment there was a

41 percent decrease in triglycerides in these same rats (Al-Amin et al., 2006).

Ginger and Anti-inflammatory agents

Ginger can be consumed as tea or you can inhale the vapors through steam, this is a method use to decrease inflammation in upper respiratory infections like flu, sinusitis, colds and bronchitis (Hoffman 2007). Ginger has also been beneficial in women who experience painful menstrual cycles (Hoffman 2007).

Ginger and Antimicrobial Activity

Ginger extract slows down the growth of two bacteria, Mycobacterium tuberculosis and Mycobacterium avium. This is a very significant finding due to the increase of tuberculosis the past few years and the increase in drug resistant Mycobacterium tuberculosis (Leal et al, 2003). Patients who are immune compromised benefit from the antimicrobial activity of ginger (Leal et al., 2003).

Ginger and Diabetes

There have been mixed reviews on if ginger has blood glucose lowering effects and if it beneficial to diabetics. Some studies show that it lowers blood glucose in both diabetic and non-diabetic animals but it also shows that ginger has increased blood glucose levels (Al-Amin et al., 2006). In a trail with rats that had been experimentally induced with diabetes they found that ginger could help in the treatment of diabetes (Al-Amin et al., 2006). The group of rats that had diabetes that were treated with ginger had a 52 percent decrease in their blood glucose levels (Al-Amin et al., 2006). The non-diabetic rats did gain weight through this trial and the control diabetic <https://assignbuster.com/ginger-and-turmeric-history-and-use/>

group lost weight (Al-Amin et al., 2006). The diabetic rats that were treated with ginger, at the end of the trial had maintained their weight (Al-Amin et al., 2006). The protein levels present in the urine of the rats that were given ginger had decrease by 60 percent (Al-Amin et al., 2006). In the diabetic rats that were administrated ginger, there was a reduction in both urine excretion as well as water consumption (Al-Amin et al., 2006). Ginger enhances the release of insulin from the beta cells in the pancreases; this is one of the few mechanisms that result in a beneficial outcome on people with diabetes (Al-Amin et al., 2006).

Ginger and Cancer

The initiation of nuclear factor-kappa B is stopped by ginger root, which will inhibit the growth of the tumor cell and the ability of new blood vessels to supply blood and nutrients to the tumor (Rhode et al., 2007). Ovarian cancer cells have shown to slow down and even stop growth in the presences of 6-shagoal, a component of ginger (Rhode et al., 2007). After one to five days of ovarian cancer cells being in the presence of ginger the growth of the cells slowed down. With the dose ranging as high as 50 micrograms/ul to as low as 30 micrograms/ul of ginger there was evidence of slowing down of the cell growth of the cancer cells (Rhode et al., 2007). Prostate cancer, colon cancer, gastrointestinal cancer, and breast cancer has been reduced in occurrence with the increase of ginger and other functional foods (Rhode et al., 2007). With the stopping of nuclear factor-kappa B, this shows that another benefit to ginger is that it is anti-neoplastic (Rhode et al., 2007). There was a decrease in the spreading of cancer in the lungs when a

bioactive ingredient of ginger, 6-gingerol, was administered to mice (Yance & Sagar et al., 2006).

Turmeric and Anti-inflammatory

The inflammatory diseases that benefit from turmeric are inflammatory bowel disease, pancreatitis, arthritis, certain cancers and chronic anterior uveitis (Jurenka 2009). There are many ways that curcumin, in turmeric, decreases inflammation for example the down regulation of cyclooxygenase-2 (COX-2) and lipoxygenase (Jurenka 2009). Another way that inflammation is reduced is to stop the formation of inflammatory cytokines. Some of these cytokines are interleukin -1,-2,-6,-8 and -12, migration inhibitory protein, tumor necrosis factor-alpha (TMF-alpha) and monocyte chemoattractant protein (MCP) (Jurenka 2009). Nuclear factor kappa B (NF-kB) is inhibited by curcumin, which prevents the action of inducible nitric oxide synthases and cyclooxygenase-2 (Jurenka 2009). Nuclear factor kappa B affects inflammation, the growth of a new tumor, cell growth and division, and transformation (Jurenka 2009). When taking 50 to 200mg/kg of curcumin, in mice, there was a smaller occurrence of edema and at 48mg/kg there was an even smaller occurrence of edema by 50-percent (Jurenka 2009). When there has been damage to the mucosal cells, for example Ulcerative Colitis, curcumin is shown to reduce the inflammation (Jurenka 2009).

When giving curcumin to rats with Ulcerative Colitis, that was induced experimentally, there was a decrease in inflammation and progress in reducing severity of symptoms; this was also true in rats that had experimentally induced pancreatitis (Jurenka 2009). When comparing curcumin to phenylbutazone and a placebo, which was lactose powder,

400mg of curcumin showed the best results in decreasing inflammation in patient after surgery (Jurenka 2009). A study done on patients with an inflammatory eye disease, anterior uveitis, there showed a positive result from the use of curcumin. There were two groups, one took 375 mg of curcumin alone and the other group took the 375mg of curcumin combined with antitubercular therapy. Following two weeks of these therapies, the group that took just curcumin there was a 100 percent improvement but the group with the combination of curcumin with the antitubercular therapy only had an 86 percent improvement (Jurenka 2009). In animals, curcumin has slowed down multiple sclerosis (Fahey et al., 2007)

Turmeric and Gastric Ulcers

When a study was done, on patients diagnosed with peptic ulcers, curcumin showed an absence of ulcers at their check up. Patients were told to take 600mg of curcumin 30 to 60 minutes prior to eating a meal , then at 4: 00 pm and once again prior to going to bed, so about five times a day. This study was conducted for twelve weeks and in a third of the way through the study 48 percent of the patients did not have any ulcers. When the twelve weeks were over 76 percent of patients were absent of ulcers (Jurenka 2009).

Turmeric and Arthritis

When rats were given 4mg/kg of curcuminoids per a day four days before arthritis inducted injection there was a 75 percent decrease in joint inflammation in a rats with acute arthritis and a 68 percent decrease in joint inflammation in rats with chronic arthritis (Jurenka 2009). Due to low levels of absorption, they decided to see if oral curcuminoids would decrease joint

inflammation. Four days before given the arthritis induced injections the rats were given a high oral dose of curcuminoids, by the third day there was a 48 percent decrease in joint inflammation. This showed that the oral intake of curcuminoids can still lower joint inflammation in regards to arthritis (Jurenka 2009). There was a reduction in swollen joints and stiffness in the morning and an increase in walking time for people with rheumatoid arthritis when taking 1200 mg of curcumin a day (Jurenka 2009). Four days before the injection, the rats were given 23mg/kg/day of curcuminoids (Funk et al., 2006). In an acute inflammatory state, there was an inhibition of 64 percent and an even better result with chronic arthritis with a 72 percent inhibition (Funk et al., 2006). Funk et al. found that whether it is a large amount of fraction turmeric or a small amount of curcuminoids that are have been purified, they both have shown to have benefits to arthritis and help suppress it (Funk et al., 2006). However they do think that the more harmless and more successful form is purified curcuminoids (Funk et al., 2006).

Turmeric and Cancer

The ability to prevent rapid cell growth and the ability to cause signaling that will result in cell death are two important ways curcumin has show to stop the growth of cancer (Fahey et al., 2007). When curcumin stops the actions of signal transducer and activator of transcription 3, this promotes the death of the cancer cell (Fahey et al., 2007). Curcumin has thought to have effect that can inhibit the growth of cancer and many studies have shown that curcumin has stopped the formation of cancer cells (Jurenka 2009). There are many mechanism of how curcumin decrease the risk of cancer. High

levels of COX-2 have been related to cancer; therefore curcumin is beneficial by decreasing COX-2 and NF-kB (Jurenka 2009). Lipoxygenase is used to metabolize arachidonic acid, when this occurs scavenging free radicals are formed. The way curcumin has anti-cancer activity is it interferes with lipoxygenase to slow down the metabolism of arachidonic acid, which reduces the free radicals (Jurenka 2009). The growth of cancer cells is slowed down when curcumin reduces the occurrence of inflammatory cytokines IL - 1B, IL-6, and TNF-a (Jurenka 2009). Protein kinase C is an intercellular signaling protein in which intervenes on the rapid growth and inflammation of the cells, curcumin down-regulates these enzymes to reduce the growth of tumors (Jurenka 2009). The anti-inflammatory and anti-oxidant actions of curcumin play a big role in its prevention of cancer (Tayyem et al. 2006). In colon cancer present in animals, curcumin slowed down the growth of tumors (Tayyem et al., 2006).

Turmeric and Irritable Bowel Syndrome (IBS)

One of the most frequently experienced symptoms of Irritable Bowel Syndrome is abdominal pain. In an eight week study done on patients with Irritable bowel syndrome patients were divided into two groups and administered 72mg of turmeric extract or 144mg of turmeric extract (Jurenka 2009). . Half way through the study the occurrence of IBS had decrease by 53 percent in patients taking 72 mg of turmeric extract and there was a 60 percent reduction in patient taking 144mg of turmeric extract. When the study was complete there was a 22 percent decrease in abdominal pain in patients taking 72mg and a 25 percent decrease in patients receiving 144mg of turmeric extract (Jurenka 2009).

Turmeric and Blood Glucose Levels

In some studies, they found that turmeric has a positive effect on glucose tolerance (Srinivasan 2005). In people taking curcumin, an active ingredient in turmeric, they were able to lower their fasting blood sugar levels, which resulted in their insulin dosage decreasing (Srinivasan 2005). In a study that looked at rats with diabetes, the rhizome extract exhibited lower levels of blood sugar levels (Srinivasan 2005). The conclusion, of the study was that people that are diabetic will benefit from 1 gram of turmeric powder with a healthy diet (Srinivasan 2005).

Turmeric and Heart Disease

Turmeric's anti-oxidant properties help in the combat against heart disease. When turmeric was from one to five percent of the diet within four weeks cholesterol and triglycerides had decreased while HDL had increased (Krishnaswamy 2007). In a sixty day trial, a group of people were given 20 mg of curcumin. At the end of the trial the levels of high density lipoprotein and low density lipoproteins peroxidation concentration had been reduced from anywhere between 25 percent to 50 percent (Bosca et al., 1997).

Turmeric and Alzheimer's Disease

When looking at the population of India, there was a noticeable link between Alzheimer's disease and turmeric. Turmeric is a greatly used spice in India and the prevalence of Alzheimer's disease is lower in India when compared to the United States (Calabrese et al., 2003). There is not much scientific finding on turmeric inhibiting Alzheimer's disease and the way it is done is unknown (Ahmed & Gilani, 2008). When observing the activity of AChE and the curcuminoids, bisdemethoxycurcumin was the most powerful

curcuminoid while curcumin was the least effective curcuminoid (Ahmed & Gilani, 2008). In the test to examine memory retention, they used rats that had scopolamine-induced amnesia and the Morris water maze. After being injected with scopolamine, the rats were given either a mixture of curcuminoid or either bisdemethoxycurcumin, or curcumin. All curcuminoids, either the mixture or individually, showed inverse effects of the scopolamine-induced amnesia, which showed that curcuminoids could be used for treating Alzheimer's disease (Ahmed & Gilani, 2008). In the brain, curcumin reduces the oxidative stress, lower the amount of plaque and inhibits inflammation. These actions are key components in preventing Alzheimer's disease but this can also play a part in inhibiting the development of Parkinson's disease also (Lim et al., 2001).

Turmeric and Antibiotics Activity

One of well know functions of turmeric is its ability to inhibit the growth of bacteria. Turmeric has shown to inhibit the growth of many bacteria including, *Staphylococcus aureus*, *Escherichia coli*, and *Pseudomonas aeruginosa* (Negi et al., 1999). Other bacteria that is inhibited by ginger is *Helicobacter pylori* (De et al., 2009). Gram positive bacteria required a lot less quantity of turmeric oil than gram negative to inhibit bacteria (Negi et al, 1999). Gram positive only required 50 ppm to inhibit the growth of bacteria but 200 pm was require to inhibit the growth of gram negative bacteria (Negi et al., 1999).

Safety/Toxicity

Ginger

Ginger is listed on the WHO monograph and the U. S. Food and Drug Administration's safe herb list (Ozgoli et al., 2009). Ginger may affect the gastrointestinal tract slightly and cause heartburn, diarrhea, and irritation to the mouth but besides these symptoms ginger does not cause any adverse effects (White 2007). In animals, ginger had inotropic effects which lead to arrhythmia (White 2007). It has been shown that 1, 000 mg a day of ginger is safe and has had better results than the higher doses (Ozgoli et al., 2009). Ginger consumption should not exceed 4 grams a day and ginger should not be given to children under the age of 2 (Hoffman 2007).

If someone is on warfarin they should check with their doctor about taking high dose of ginger (White 2007). Patients should talk to their primary care physician about taking warfarin and ginger they both having blood thinning effects(Hoffman 2007). There needs to be more research on adverse effect and drug interaction with ginger (White 2007). If someone has gallstones, they need to talk to their doctor about taking ginger as a medicine due to the ginger increasing the flow of bile (Hoffman 2007).

Ginger has no adverse effects on the outcomes of pregnancy and is a safe and practical product to be used (White 2007). The potency of ginger increases when it is in powder form, so it is advised that pregnant women do not take ginger in powdered form (Hoffman 2007).

Turmeric

Turmeric has shown to be a very safe supplement. In a human trial that lasted for three months they were administrated 8 grams of curcumin a day
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and determined that it was safe (Chainani-Wu 2003). Studies have shown that it is safe to take up to 8 grams of curcumin, an ingredient in turmeric, on a daily bases (Jurenka 2009). The only concern with turmeric is hepatotoxicity; in two studies done with rats and mice hepatotoxicity was showing up in test (Chainani-Wu 2003). In one study, rat and mice were given a diet of 5 percent turmeric and turmeric extract for 90 days there were adverse effect of weight loss, change in the weight of the liver, and hepatotoxicity (Chainani-Wu 2003). Another study performed on mice, within 14 days of the study there were signs of hepatotoxicity (Chainani-Wu 2003). The diet was made of 0. 2 percent to 5 percent turmeric and a . 05 percent to 0. 25 percent ethanolic turmeric extract (Chainani-Wu 2003). In human studies there seem to be no problem with hepatotoxicity and Chainani Wu believes this because humans metabolize curcumin more easily than rats (Chainani-Wu 2003). In the study done by Bosca et al., they had not adverse side effect on the liver from turmeric; they looked at liver enzyme and monitored the bilirubin levels (Bosca et al., 1997).

If patients are taking chemotherapy drugs they should talk with their doctors (Jurenka 2009). Curcumin can inhibit as well as enhance chemotherapy drugs, so it is important to discuss the type of drug you are taking with your doctor (Jurenka 2009). Patients on anticoagulant and antiplatelet medicines should talk to their doctors before taking high doses of curcumin; because of its ability prevent platelet aggregation (Chainani-Wu 2003). If patients are suffering from gallstone before taking large dose of turmeric they should discuss it with a doctor. The contractions of the gallbladder are increased when taking curcumin (Chainani-Wu 2003).

Conclusion

Both ginger and turmeric have been proven safe by many studies and have shown great benefits to the health of individuals. Turmeric and ginger both have shown to decrease negative effects of diabetes, heart disease, arthritis, and cancer. Both of these spices show antimicrobial and anti-inflammatory properties. There seem to be no detrimental side effect of taking ginger or turmeric, so there is no harm trying to add more into your diet. As with adding any supplement it best to take in moderation and contact your primary care physician.