

Turmeric: Our Golden Panacea

by Eileen Ramos

Introduction

Turmeric is a staple household spice used in many Indian homes and is best known as the yellow ingredient in curry dishes. This vibrant colored spice is used everyday in Southeast Asia to enhance food and to purify the skin. The women of India use it as a facial mask believing it nurtures a beautiful complexion. The bright yellow-orange color is used as a dye for many foods like American cheese and mustard. It can also be used in religious and sacred venues where it covers the sacred thread, Yajnopavita, worn by Brahmin in India. In addition to its many uses throughout the Indian culture, turmeric is also a potent herb that has been used in Ayurveda and Traditional Chinese Medicine for at least 4,000 years. This common household spice is greatly revered and has been used often due to its impressive medicinal properties.

Turmeric's vast healing specialities are described in the 53 Sanskrit names given to it. In general, it is also known as 'Haldi' which comes from the Sanskrit word "haridra" and means yellow one. In fact, in many languages, it is translated as, yellow root. Yet, other names give credit to its many assets and compliment this well known spice using names like "Varvarnini" (Chosen One), "Kanchani" (Golden Goddess), "Mangalya" (Divine Gift) and "Pavitra" (Sacred). Prashanti de Jager explains that the turmeric name, "Aushadi" which simply means herb, is often used in the Vedas from thousands of years ago. He surmises that by constantly referring to turmeric as "herb", may be evidence that they considered turmeric as, "Thee Herb", the most outstanding herb, the one herb above all others." [1] Interestingly, Marco Polo discovered turmeric in China in 1280 and referred to it as a poor man's saffron. He missed the boat on this spice for it seems to be living up to another name, Indian Gold.

In Latin, and therefore in the botanical world, turmeric is called *curcuma longa*. It is a "rhizomatous herbaceous perennial plant of the ginger family Zingiberaceae." [2] India grows most of the turmeric plants in the world and consumes 80% of it. The South Indian state named, Tamil Nadu, is the world's largest producer of turmeric and much trade occurs in the city, Erode. The key part of the plant is the rhizome which is the stem of the plant that grows underground in a dark, wet soil of tropical temperatures ranging between 20 degrees Celsius and 30 degrees Celsius. There is a main rhizome which branches off to smaller tubers. The root has rough skin which is divided into segments and has an orange interior. The rhizome is dried and then

grounded to a powder to be used as a spice. The tubers can also be used raw and grated into food and drink. From a phytochemical analysis it seems the root consists of 70% carbohydrates, 8% protein, 4% minerals, 1% resin and 4-14% essential oils like the sesquiterpenes. Furthermore, there are also 3 alkaloidal curcumins: curcumin, Demethoxy-curcumin and Bisdemethoxy-curcumin. Both the volatile oils and the curcuminoids have been isolated as the active factors of turmeric. Volatile oil, also known as essential oil, is a “concentrated hydrophobic liquid containing volatile aroma compounds from plants.” [3] The components responsible for the aroma of turmeric are turmerone, ar-turmerone and zingiberene. According to de Jager, the essential oils from turmeric consist of a concentrated mix of rare and unique molecules and many have receptor sites in the neuro-endocrine area of the brain.[4] They are responsible for lowering triglyceride levels, aiding in digestive and carminative issues and supporting the liver. Ar-Turmerone is an effective anti-venom source destroying the lethality of the Pit Viper bite as well as an effective repellent against mosquitoes.[5] Plus, turmeric oil has been found effective in removing sputum and preventing asthma.[6] Despite the strong role the essential oils play in turmeric, it is the curcumin which offers the magic.

Many marvel at curcumin’s potency and efficiency and it works in many diverse ways. It is due to its triple threat actions as an antioxidant, anti-inflammatory and anticancer agent that has helped turmeric gain much attention in the modern medical world. Some believe it is as effective if not more effective than pharmaceutical drugs. Curcumin is a polyphenol, a group of compounds found in plant food that have antioxidant properties and give fruits and vegetables their vibrant colors as well as their bitter and astringent aroma and flavor. Antioxidants are well known to protect our bodies from free radicals, also known as corrosive oxygen molecules. These corrosive oxygen molecules contribute to the deterioration or death of human cells. Plus, when these “effected” cells reproduce, they create a new generation of cells that are not as well functioning as the previous generation. Therefore we begin to age, or worse, we begin to create an environment susceptible to disease. Oxidative stress is “essentially an imbalance between the production of free radicals and the ability of the body to counteract or detoxify their harmful effects through neutralization by antioxidants.” [7] Curcumin may be one of the most powerful antioxidants. According to the Oxygen Radical Absorbance Capacity scale which rates a food’s antioxidant levels, curcumin rates were over 1.5 million per 100 grams while blueberries, known for being a strong antioxidant food, received a 6,000 per 100 grams rating.[8] As an antioxidant, curcumin is capable of fighting cancer cells, inhibiting angiogenesis (the growth of blood vessels

that feed a tumor), combating free radicals, protecting the cardiovascular system, promoting brain health, supporting blood sugar levels and reducing inflammation.

Curcumin is best known for its anti-inflammatory properties. Inflammation, in general, is a healthy and necessary function of the human body to heal and repair. But inflammation in a chronic state, when the body's immune system is overreacting, is when it can become harmful. Many chronic diseases are related to chronic inflammation such as rheumatoid arthritis, inflammatory bowel disease, asthma and multiple sclerosis. Inflammation also plays a role in cardiovascular disease, cancer and chronic obstructive lung disease. There has been much research on the anti-inflammatory properties of curcumin and results have shown great efficacy on serious inflammatory diseases like inflammatory bowel disease, arthritis and some cancers.^[9]

Ayurveda and Turmeric

The impressive qualities of turmeric were discovered thousands of years ago and had a very central place in traditional medicine. Ayurveda honors 5 great elements in the universe: Ether, Air, Fire, Water and Earth. Ayurvedic herbalists are interested in determining what qualities the herb possesses to inform their decision on how to best use the herb. It is rare that something can represent all 5 elements and this may be the first clue as to why turmeric hosts a broad range of power.^[10] It is grown in a moist, dark and warm soil giving it earthy and watery qualities. Its bright orange color represents fire. The white-red-orange flower connects to its etheric quality and finally its bitter taste has cold air. Turmeric's energetics are as such, it is warming so it pacifies Vata and Kapha, it is bitter and astringent so it pacifies Pitta dosha, it is dry and light in quality and its post-digestive effect is pungent. Again, turmeric is "all encompassing" and is capable of balancing all three doshas, Vata, Pitta and Kapha. Turmeric is traditionally known to decrease Kapha, mucous and fat and purify the blood, rakta. Turmeric is a great carminative which helps with gas and distention. It also helps with absorption and nurtures the intestinal flora. Treating these digestive issues makes turmeric a top herb in Ayurveda since digestion is the basis for good health. Home remedies found in the Indian Materia Medica demonstrate its prevalent uses from ancient times. One of its primary uses was as a purifier. It was used to purify the blood and help with skin conditions. Chakradatta recommended this remedy for eczema and scabies, "It is prepared by taking madder, the three myrobalans, lac, turmeric, orpiment...in equal parts, in all one seer."^[11] Also, in the preparation of a medicated ghee it is advised that, "A little turmeric juice is then added to purify it."^[12] Other primary traditional uses were: Vedana

sthapana where it pacified Vata and acted on the nervous system, Sangrahani where it was used for chronic malabsorption and stimulating agni and Rakta stambhaka where it was used as a hemostat to heal wounds. Leech bites were probably more common in India than North America and therefore, turmeric was often used as a hemostat in traditional remedies, “after removal of the leeches, various hemostats are used, such as.....turmeric.”^[13] Furthermore, turmeric is mentioned in the Dravyaguna Vijnana to treat wounds. “The rhizome is used as a stimulant; and is externally applied to bruises, cuts, ulcers, sprains and pain. It is orally given in blood diseases....It is used externally on bruises and snake bites.”^[14] Prashanti de Jager has used turmeric in his own home remedies and describes his own experience with using turmeric. He covered his finger wound with the powder, it stopped bleeding and never bled again. It began to simply, heal.^[15] This anecdote may be a decent description on how they actually discovered the power of the golden powder thousands of years ago.

Western Disease and Turmeric

As mentioned earlier, the active ingredient in turmeric is curcumin. In 1815, this molecule was isolated by western chemists and for only 30 years, turmeric has been used as medicine in the United States. It took Westerners quite some time to value turmeric’s abilities, but recently it is known to be one of the most researched herbs in the world. Dr. Aggarwal at the University of Texas M.D Anderson Cancer Center and his team have been comparing curcumin to other anti-inflammatories. He says, “Curcumin proved to be more effective at reducing inflammation than over-the-counter aspirin....and as effective as the more powerful prescription drug,Celebrex.”^[16] This is only the tip of the iceberg in the positive research results beginning to emerge around turmeric. The list of ailments whereby turmeric has had its impact is quite astounding: arthritis, Alzheimer’s disease, many cancers, parasites, HIV/AIDS, leprosy, shingles, atherosclerosis, eczema, scabies, insect bites, wounds, diarrhea, detoxifying pollutants, cataracts, irritable bowel syndrome, hemorrhoids, amenorrhea, asthma, liver disease, multiple sclerosis and the common cold just to name a few. Obviously, it is very difficult to discuss the full scope of turmeric’s promising contributions to health in this paper, therefore a selection of common diseases will be addressed to give a sense of this herb’s superstar abilities.

Heart Disease

Heart disease is the number one killer in the Western world and is a common complication of diabetes, which will be discussed later. Turmeric is responsible for many actions which protect the heart, the circulatory system and blood. More specifically, curcumin helps keep the arteries clear by increasing HDL cholesterol and purifies the blood so it is not sticky. As well, it reduces the homocysteine in the blood. When this amino acid begins to build up in the blood stream it damages the arterial walls. "Curcumin helps to relax those arterial wall cells, reduces the hardening of the arteries and allows the blood to flow more freely, dissolving clots and preventing and even reversing plaque build up."^[17] When these effects are reduced, then there is decreased risk for a heart attack, stroke, and heart disease.

Arthritis and Chronic Pain

Joint pain is most commonly caused by the deterioration of the cartilage between the joints causing bone to rub on bone and inflammation occurs. Many sufferers of joint pain and back pain use NSAIDs, non-steroidal anti-inflammatory drugs such as aspirin, ibuprofen, Voltaren and Celebrex, the last two being prescription drugs. These drugs work by inhibiting the COX-2 enzyme which causes inflammation, but they also inhibit COX-1 enzyme which is needed to protect the linings of the blood vessels and digestive tract. It is not surprising to learn that curcumin, being the intelligent healer that it is, is able to only inhibit the COX-2 enzyme while not touching the COX-1 enzyme. In addition, while curcumin is reducing inflammation, it also prevents further cartilage break down and offers pain relief. Prescription drugs warn their users of certain side effects like ulcers, stomach bleeding, chest pain and fainting to name a few, while those using curcumin reported no side effects.^[18] Finally, Curcumin mixed with Boswellia proved to be as effective as Voltaren and Celebrex.^[19]

Type 2 Diabetes

Type 2 Diabetes is a Western lifestyle disease where the consumption of processed foods and super-sized sugar drinks are abundant. Those with this disease have bodies which are insulin resistant, meaning their cells become unresponsive to the insulin being produced by the

pancreas for unknown reasons. It is important to note that this disease is mostly associated to being overweight, if not obese. The complications to this non-insulin dependent diabetes are overwhelming. Here is a list of a few: 68% have heart disease if 65 and over, 67% have high blood pressure, 44% of all new cases have kidney failure and 60 to 70% experience nerve damage which causes erectile dysfunction in men.^[20] The studies have shown that curcumin's anti-inflammatory powers seem to help those with diabetes Type 2 and their complications. Moreover, "Indian researchers found that curcumin contains a particularly powerful antioxidant, tetrahydro-curcumin, which lowers blood sugars, increases insulin in the bloodstream and protects against fatty deposits in the arteries."^[21] Another study by Huang et al, focused on the effect of curcumin and how it may protect the kidneys. They researched on diabetic rats and found that the "down regulation of the SphK1-S1P pathway is probably a novel mechanism by which curcumin improves the progression of diabetic nephropathy."^[22]

Alzheimer's Disease

Alzheimer's disease is a form of dementia, it is a progressive, unalterable loss of cognitive function and mostly affects those 65 years and older. Five percent of those with Alzheimers have early onset when it appears in their 40s or 50s. As the disease progresses, memory loss increases and individuals lose their ability to hold a conversation and respond to their environment. They live an average of 8 years after their symptoms have become noticeable to others. The etiology is unknown, but 5% of those with the disease are from genetics. Researchers have found that there are beta-amyloid plaques and tangles on the Alzheimer brain. These plaques and tangles are proteins that accumulate or tangle to create tau fibers which disrupt neuron function, hence mental function. Dr. Ralph Martins at Australia's Sir James McCusker Unit for Alzheimer's Disease Research stated, "...curcumin markedly lowers the level of beta-amyloid in the brain.....curcumin is a powerful antioxidant and thus plays a significant role in reducing brain damage caused by oxidative stress."^[23] Research has been seeing the protective effects curcumin has against amyloid plaques and conclude that it might be most beneficial in terms of prevention.^[24] Interestingly, Indian people tend to eat turmeric daily and their rate of incidence is among those who are older than 65 (70-79 years old) and only one quarter of the rate of those inflicted in the United States. Furthermore, when conducting autopsies on the Indian brain, a yellowish color was found on their brain stem tissue. This color has not been re-

ported on other brain stem tissues from people of other ethnicities. Perhaps turmeric has left its mark.

Depression

Around 18 million U.S adults suffer from major depression, a DSM diagnosis, which differs from the occasional “blues” or sadness from a loss. According to Dr. Cass, an integrative physician with a specialty in psychiatry, comments that people with major depression are deficient in these neurotransmitters: serotonin, noradrenaline and tryptophan. Studies are showing good results indicating that curcumin along with piperine, an alkaloid in black pepper, are useful natural products showing antidepressant activity.^[25] Again, curcumin is proving to be as effective as pharmaceutical drugs like Prozac and without the negative side effects associated with the pharmaceutical drugs. In addition, turmeric has been found to enhance nerve growth in the frontal cortex. This part of the brain is where humans control important cognitive functions such as emotional expression.

Digestive Disorders

It has already been discussed how turmeric aids in basic digestion where it dispels gas, improves the body’s ability to digest fats and stimulates bile production. Yet, it also impacts more serious digestive disorders such as Irritable Bowel Syndrome, Ulcerative Colitis and Crohn’s disease. A major factor in all of these disorders is inflammation. Again, curcumin has proven to be a powerful anti-inflammatory in calming inflammation in these disorders. A Japanese study involving humans showed that curcumin supplements prevented recurrences of Ulcerative Colitis and reduced the bleeding and progression of liver disease.^[26] In another study, it is shown that curcumin with its strong anti-inflammatory properties prevents angiogenesis which feeds the inflamed digestive tract while studying those with Irritable Bowel Syndrome.

Cancer

Cancer is not the number one killer in the Western World, but lung, colon, prostate and breast cancers are responsible for many deaths. According to Dr. McBarron, in her book, Cur-

cumin, she explains that only 2% of cancers are related to genetics. Therefore, some physicians and researchers are interested in the role of epigenetics and cancer. Epigenetics are the changes in gene expression that do not involve changes to the DNA sequence. Instead, epigenetic changes occur through our lifetime and are most influenced by our eating habits, exercise routines, environmental toxins and stress. These factors can cause damage to the cells like carcinogens, substances that cause DNA mutations, which damage or change a cell and affect normal cell growth and division. It would be best if these changed cells died because the body does not need them, but instead they grow. And often they grow into a mass of tissue called a tumor. Yet, unlike a defective gene where we cannot make alterations, epigenetic research is suggesting that we can keep our genes healthy with our lifestyle and we may also be able to reverse some of the negative epigenetic changes. Dr. Goel, from the Gastrointestinal Cancer Research Laboratory at the Baylor Research Institute at Dallas, explains that all our cells have a finite life span and some of these cells go into a “deep slumber” as oppose to die. Curcumin has been scientifically proven to “wake up” those cells and guide them to their cell death process known as apoptosis.^[27] Another study by Su who investigated pancreatic cells also found that curcumin suppressed cell growth and induced cell apoptosis.^[28] McBarron sums up curcumin’s cancer fighting abilities as blocking carcinogens, preventing the spreading of cancer cells by slowing down or inhibiting the needed enzyme metalloproteinase, reducing angiogenesis which feeds the tumors and finally encouraging apoptosis of the cancer cells. Once again, curcumin demonstrates warrior-like qualities while combatting cancer and earns its name, The Golden Knight.

Considerations of Turmeric

There are situations where turmeric is not recommended and should be noted. For those on blood thinners such as warfarin, turmeric is not advised since it can magnify the effect of the anti-clotting drugs. It may also worsen gallstones or bile duct obstruction. It could interfere with antacid medications and may aggravate GERD. It should not be taken with diabetic medications that are already lowering blood sugar levels. Excessive amounts of turmeric may cause stomach pain, diarrhea and nausea. Finally, pregnant and lactating women should avoid turmeric because it may stimulate the uterus or promote menstruation.

The bioavailability of turmeric is being researched since the current findings are suggesting that it has limited bioavailability. There are a few factors which seem to aid in its bioavailability.-

Firstly, turmeric is not water soluble, it is fat soluble, therefore it is best taken with oil or butter. Secondly, Piperine, an alkaloid in black pepper, also helps the body to better absorb the herb. Thirdly, heat may be beneficial. Interestingly, these 3 elements are used while cooking a curry where the oil is heated and then the turmeric and black pepper are added. Finally, liposomes and phytosomes are being researched as encapsulation systems to increase the body's ability to absorb turmeric. Liposomes were discovered in breast milk. They were seen as "protective agents" that delivered important nutrients to the baby without being destroyed by enzymes and various flora. Now liposomes are carrying the turmeric through the digestive tract without most of it being destroyed, into the bloodstream and to its final destination, the cells. Liposomal turmeric claims to be 20 times more bioavailable than the isolated compound of curcumin. Curcumin phytosome bonds curcumin to a Phosphatidyl Choline molecule which also protects the curcumin molecule and delivers it more efficiently to the cells than the isolated compound.

Lastly, it is important to note that much of the research on turmeric is according to animal and in vitro studies. The National Center for Complementary and Alternative Medicine has been funding clinical research on humans and reports, "there is little reliable evidence to support the use of turmeric for any health condition because few clinical trials have been conducted."^[29] This comment was made in 2014 and already human clinical studies are becoming more prevalent with results that validate its efficacy. Traditional sages valued turmeric's efficacy without science, but perhaps, Western research will not only validate turmeric's efficacy, but it will also guide us in better understanding how to further unlock turmeric's powers.

Conclusion

Dr Frawley, an Ayurvedic Practitioner, Writer and Spokesperson, makes a bold statement regarding turmeric, "If I had only a single herb to depend upon for all possible health and dietary needs, I would without much hesitation choose the Indian spice turmeric."^[30] Ayurveda has known for millenia what modern science is beginning to discover, that turmeric is not only the kitchen queen, but also a wise healer. In the Ayurvedic Spice of Life, De Jager points out that turmeric's essential oil has "400-500 different species in a single oil from a single plant... that have receptor sites in the neuro-endocrine system of the human body. Furthermore,...some of

the plant molecules with human receptor sites do **not** have a use to the plant itself.”^[31] It is extraordinary to consider this evolutionary connection between humans and the turmeric plant. Turmeric has proved to be an amazing healer to those who use her. Some of her specific properties care for the human’s neuro-endocrine body; the system which makes humans a more developed species than herself, an herb. Yet, her own intelligence is displayed in that she seems to know that she has a role in healing humans. Perhaps we can better understand her healing complexities through the mind of Darwin. He may have suggested that throughout the thousands of years, as turmeric has been used more and more, the plant has continued to mutate and become more sophisticated so it can compete with other herbs and keep its place on earth. Therefore, the more humans cultivate and use her, the more we encourage her to realize her full potential as our Golden Panacea.

Notes

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