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A review on turmeric: For the treatment of skin disease (Vitiligo)

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Abstract
Turmeric is a rhizomatous herbaceous perennial plant of the ginger family, Zingiberaceae. It is native to Southeast Asia, and requires temperatures between 20 and 30 °C (68–86 °F) and a considerable amount of annual rainfall to thrive. Plants are gathered annually for their rhizomes and propagated from some of those rhizomes in the following season. Belonging to the ginger family, turmeric has been used in East India and the Middle East for thousands of years, and is now one of the most highly-prized spices in the world. Vitiligo is a skin disorder where the skin pigment is lost in certain regions and discolored or white patches remain on the skin. It occurs when skin cells are unable to function appropriately or when they die. Though many causes for vitiligo progression have been suggested, its exact mechanism of pathogenesis is still unclear. The beneficial effects of turmeric are traditionally achieved through dietary consumption, even at low levels, over long periods of time. Vitiligo is a skin disease that is prevented by turmeric, because turmeric has high antioxidant and high anti-inflammatory activity, that cure vitiligo and also helps to synthesis of melanin formation.

Keywords: turmeric, vitiligo skin disease, anti-inflammatory and antioxidant activity

1. Introduction
Turmeric is a rhizomatous herbaceous perennial plant of the ginger family, Zingiberaceae. It is native to Southeast Asia, and requires temperatures between 20 and 30 °C (68–86 °F) and a considerable amount of annual rainfall to thrive. Plants are gathered annually for their rhizomes and propagated from some of those rhizomes in the following season. Belonging to the ginger family, turmeric has been used in East India and the Middle East for thousands of years, and is now one of the most highly-prized spices in the world. It's actually unclear whether it was first used for its peppery flavor and the unique kick it lends to foods. Ancient medicinal uses for turmeric began when it was noted as an anti-inflammatory agent, and then to treat a wide variety of conditions, such as jaundice, menstrual problems, blood in the urine, hemorrhaging, toothaches, bruises, chest pain, flatulence, and colic. The name “turmeric” is derived from the Persian word for "saffron," the neon yellow-orange hue used to make curry and yellow mustard. A domesticated plant rather than wild, India remains one of the most prominent producers of turmeric, along with Indonesia, the Philippines, China, Taiwan, Jamaica, and Haiti.

1.1 History of turmeric
Marco polo (1280 AD) refers to turmeric as Indian saffron used for dying cloths. As far as documented evidence, it is used daily in India for at least 6000 years as medicine, beauty aids, cooking spice and a dye. Ostensibly it was used to worship the Sun during the solar period of India, a time when Lord Ram Chandra walked the Earth. It was mentioned in the Artharveda of India. Buddhist monks have used turmeric as a dye for their robes for at least 2000 years. It was listed in an Assyrian herbal circa 600 BC and was mentioned by discorides in the herbal that was the western herbal rediscovered it 700 years ago via Marco Polo and it is used in traditional lethal poison of pit vipers. In China it was mentioned in the Pent-Sao of the 7thcentury. For at least 1000 years Chinese are used turmeric as medicine especially for the spleen, stomach and liver medicines. They use it to stimulate and purify and as an anti-biotic, anti-viral and an analgesic. As such it is used to stimulate Review Article Bulletin of Environment, Pharmacology and Life Sciences ~and strengthen the blood and decrease blood pressure, to clean abdominal pain and stagnation in men, woman and children. They consider it one of the better herbals for woman because it stimulates the uterus and clears menstrual stagnation. In the 1870’, chemists discovered turmeric orange yellow root powder turned reddish brown when exposed to alkaline chemicals. This discovery led to the development of turmeric paper to test for alkalinity. European and American herbalists up until the rate 20thcentury had little interest in turmeric. In one western herbal from the early 20th century, Maude Greve’s book A Modern Herbal, in which she gives a botanical description and the constituents of the herb as if the herb was of some importance, but then under medicinal actions and uses she says; “Turmeric is a wild aromatic stimulant seldom used in medicine except as a colouring. It was once a cure for jaundice. Its chief use is in the manufacture except as a colouring. It was once a cure for jaundice. Its chief use is in the manufacture of curry powder. It is used as an adulteration of mustard and a substitute for it and forms once of the ingredients of cattle condiments. Turmeric paper is used as a test for alkaloids and boronic acid”. Daniel B. Mowrey tells the story. “Serious research on turmeric began in Germany, in the early 1920’s. Sesqueterpenes in the essential oil of turmeric were isolated in 1926 and to them was ascribed the therapeutic activity

1.1.1 Health Benefits of Turmeric

- Basic nutritional aspects of turmeric include a 26% daily value in manganese and 16% in iron. It's also an excellent source of fiber, vitamin B6, potassium, and healthy amounts of vitamin C and magnesium.
- While it's improbable that someone would ingest an entire ounce of turmeric in one sitting (although it would be completely safe), the nutritional aspects listed above can be seen more easily in this amount than in a teaspoon, which accounts for zero amount of anything. But one tablespoon, being a more reasonable serving, does communicate excellent phytonutrients. In fact, turmeric is effective even in very small quantities, such as one serving of a turmeric-spiced dish.
- The health benefits of turmeric include an improved ability to digest fats, reducing gas and bloating, decreased congestion, and improved skin conditions such as eczema, psoriasis, and acne.
- Turmeric has been used as a powerful anti-inflammatory in Chinese and Indian medicine for millennia. Curcumin, the primary pharmacological agent in this spice, contains proven effects in this area that are comparable to over-the-counter anti-inflammatory agents as well as some prescription medications. But curcumin doesn't produce the toxic effect that synthetic drugs sometimes do, such as ulcer formation, internal bleeding, and even a lowered white blood cell count.
- More reported health benefits of turmeric include relief from joint pain, such as rheumatoid arthritis, reduced joint swelling, and greater range of motion when used regularly. It's another case of the spice alone having similar effects to that of a prescription medication, but with fewer symptomatic downsides.
- Research also suggests that turmeric may be helpful in treating inflammatory bowel diseases, lowering cholesterol counts, protecting the heart, relieving indigestion, improving liver function, and even preventing Alzheimer's disease. Cancer prevention and inhibited cancer cell growth specifically cancer of the breast, colon, prostate, and lung, and childhood leukemia are also on the list of possible benefits.

1.2 Vitiligo (skin disorder)

Vitiligo is a skin disorder where the skin pigment is lost in certain regions and discolored or white patches remain on the skin. It occurs when skin cells are unable to function appropriately or when they die. Though many causes for vitiligo progression have been suggested, its exact mechanism of pathogenesis is still unclear.

- **Symptoms**

The main sign of vitiligo is patchy loss of skin color. Usually, the discoloration first shows on sun-exposed areas, such as the hands, feet, arms, face and lips.

- Patchy loss of skin color
- Premature whitening or graying of the hair on your scalp, eyelashes, eyebrows or beard
- Loss of color in the tissues that line the inside of your mouth and nose (mucous membranes)
- Loss of or change in color of the inner layer of the eyeball (retina)

Vitiligo can start at any age, but often appears before age 20.

- **Different factors have been suggested to cause vitiligo such as**
- Genetic alterations
- Autoimmunity (when body recognizes its own cells as foreign bodies and attacks it)
- Oxidative stress
- Changes in skin pigment (melanin) or inflammatory disorders such as thyroiditis.

1.2.1 Physiology of melanin

In human skin melanin is produced from the amino-acid named tyrosin by the action of copper-containing enzyme tyrosinase. This enzyme is present in the melanocytes, which are located in the basal cell layer and transfer their pigment to the keratinising cells of the epidermis by means of their dendrite processes. In vitiligo this pigment is lost along with the keratinised cell during exfoliation of skin. Vitiligo & Leucoderma can occur either due to a disturbance in the formation of melanin or in its loss from the skin. The formed white spot gradually enlarges and forms a larger patch. In some cases these patches remain stagnant through whole life. But in most cases these spread spontaneously and merge to each other covering most of the skin area. Alternately, in many cases only one patch enlarge spontaneously covering a larger skin area.

1.2.2 Role of Turmeric in treating vitiligo

Turmeric, a spice native to India, has been used since ages to treat skin disorders as well as a cosmetic aid to lighten skin tone as per traditional medicine records. Research studies and clinical trials stating the use of turmeric as a cure for vitiligo are limited but we will evaluate the role of turmeric on the basis of theoretical findings regarding its medicinal properties and evidence from Ayurvedic literature. This section presents few of the properties of turmeric which theoretically seem to be helpful in curing and controlling vitiligo by acting on the factors that cause it.

- Curcumin in turmeric exhibits antioxidant property which reduces the agents that cause the imbalance in antioxidant defenses.
- How to cure vitiligo (skin disease) by turmeric.

The loss of melanocytes is part of the inflammation phase invitiligo. Turmeric being an anti-inflammatory agent helps control vitiligo related inflammation.

- Curcumin in turmeric helps in repairing skin. This property may help in the re pigmentation of the skin.
- **Antioxidant property**

Oxidative stress is an imbalance between body’s natural antioxidant defenses and its ability to produce reactive oxygen species. Oxidative stress in vitiligo leads to increased production of hydrogen peroxide and reactive oxygen species in the skin. This initiates DNA damage, lipid or protein per oxidation (degradation of fats and proteins by reactive oxygen) and inhibition of tyrosine’s (enzyme that produces melanin).Cell death occurs and inflammatory mediators like tumor necrosis factor-alpha, interferon’s, and interleukins etc. which inhibit production of melanin.
Turmeric, especially curcumin displays antioxidant property in the following manner:

- Scavenging of reactive oxygen species
- Inhibiting lipid per oxidation
- Increasing levels of antioxidant enzymes and decreasing agents that promote oxidative stress
- Modulation of protein Nrf2 which regulates body's antioxidant responses

Through these mechanisms turmeric can control oxidative stress in vitiligo, prevent progression and facilitate regimentation.

- **Anti-inflammatory property**

The transient phase of inflammation in vitiligo is marked by loss of melanocytes (type of skin cell).It is characterized by accumulation of immune cells such as T cells, macrophages which promote autoimmunity- produce proteins that recognize melanocytes as intruders and attack them. Inflammatory cytokines such as Interleukin-1, tumor necrosis factor-alpha are produced which promote death of melanocytes and also inhibit their functioning. Turmeric is touted as anti-inflammatory agent. It demonstrates this property by inhibiting production of inflammatory mediators, suppressing activity of protein nuclear factor-kappa-B which in turn down regulates activity of enzymes belonging to inflammatory pathways and also prevents infiltration and adhesion of immune cells at the site of adhesion. In this manner turmeric can help control inflammation in vitiligo though it cases of inflamed vitiligo conditions are rare.

- **Skin regenerative property**

Curcumin, the prime constituent of turmeric by means of antioxidant and anti-inflammatory mechanisms, helps in repairing skin. Control of oxidative stress, modulation of biochemical pathways, regulation of enzymes, preventing inflammation are few of the techniques it uses to heal wounds and repair the skin.

Mustard Oil And turmeric powder for treatment of Vitiligo.

In Ayurveda, Mustard oil is one of the most significant remedies. Mustard oil is very beneficial to heal this type of skin disease. Mustard essential oil is known for fighting bacterial infections as well, as it has strong antibacterial properties. Mustard essential oil contains allyl isothiocyanate in it, which has strong antifungal properties. It can therefore prohibit the growth of fungus anywhere on the body. Mustard oil with turmeric powder is one of the most popular home remedies used to heal Vitiligo. It helps in producing intense melanoid pigments

According to a recent study, mustard or mustard oil has enormous therapeutic potential for treating Vitiligo. Paste of mustard oil and turmeric will help intensify the pigments of the skin.

Conclusions

The beneficial effects of turmeric are traditionally achieved through dietary consumption, even at low levels, over long periods of time. Vitiligo is a skin disease that is prevented by turmeric, because turmeric has high antioxidant and high anti-inflammatory activity, that cure vitiligo and also helps to synthesis of melanin formation.

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