



Review Article

A DEEP INSIGHT ON THE CAUSATIVE AGENTS SYMPTOMS AND CURE FOR SKIN CANCER: A REVIEW

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ABSTRACT

The main objective of this review is to evaluate the current knowledge about the interrelation of skin and nutrient, particularly the influences of nutrients on cutaneous immune responses, the photo protective effects of nutrients and the therapeutic actions of nutrients in skin disorders. The review encompasses some medicinal plants used for the treatment of cancer disease. The plant sources of India likely provide effective anticancer agents. In this article, we have covered the information which is gathered from the plants used recently identified in the cancer treatment. The focused nutrients are carotenoids, vitamins, and polyunsaturated fatty acids.

Keywords: Skin Cancer, Nutrients, Ultraviolet light, Medicinal Plants, anti-cancer activity, Supplements.

INTRODUCTION

Skin

One of the largest organs of the body is the skin ¹. It is an organ that separates human body and environment. It provides protection to the other system of the body and acts as a barrier protecting the body against UV radiation and toxic substances ². There are three layers contained in the skin- the outer epidermis, dermis and deep subcutaneous layer.

Skin Cancer

When the uncontrolled growth of abnormal keratinocyte cells of skin takes place then it causes skin cancer. A large amount of UV-radiation reach earth's surface due to depletion of ozone layer, they form UV exposure and it is the main reason responsible for skin cancer. There is two type of skin cancer- non-melanoma and melanoma skin cancer. Basal cell carcinoma is the most common type of skin cancer ³.

Skin Disease

There are several diseases caused by skin some of that are as follows

Scabies is a skin condition caused by tiny mites called *Sarcoptes scabiei* ⁴, Pyoderma is a skin infection caused by bacteria ⁵, Fungal infection includes infections such as ringworm or dermatophytosis caused by lipophilic yeasts & *Malassezia* Species, Tropical ulcer is a chronic ulcerative skin lesion thought to be caused by polymicrobial infection ⁶ and Hyperpigmentation associated with inflammatory skin lesions such as acne ⁷.

HEALTH SUPPLEMENTS

Vitamin D and Calcium

Vitamin D is very essential for the human health and it is synthesized by the skin after exposure to sunlight ⁸⁻¹⁰. Vitamin D has been established as an important component of bone health by the scientific literature ¹¹⁻¹³. Its role has been devoted to the prevention of numerous chronic diseases including obesity, Diabetes, high blood pressure, heart disease and the certain type of cancer. Great interest in cancer prevention has been recently generated by Vitamin D, particularly in relation to breast, colorectal, and prostate cancers.

Folic Acid

Folate is a water-soluble vitamin B and it is required for a variety of methylation-related processes. The most intense studies were performed about an association of folate and folic acid with cancer risk regarding colorectal neoplasia. It is approximately known that synthetic sources of folate may be conferred greater protection than natural forms ¹⁴, results of one meta-analysis of observational studies ¹⁵. Increasing risk of prostate cancer was also found in this RCT ¹⁶. Because it is shown by preclinical studies ^{17, 18} that the potential for a pro-neoplastic effect of folate at least in animals with preexisting neoplasm the possibility of enhanced carcinogenesis is a concern.

β-Carotene

Carotenoid was most widely studied, and β-Carotene is one of the most abundant carotenoids in the human diet. Carrots (*Daucus carota*), sweet potatoes (*Ipomoea batatas*) and pumpkin (*Cucurbita pepo*) ¹⁹ are some of the dietary sources of β-carotene.

β -carotene can be accumulated and stored by melanocytes and keratinocytes both, for conversion into retinol when required²⁰. It was observed in this study that β -carotene may have inhibited tumor-specific angiogenesis by inhibiting the activation or nuclear translocation of various transcription factors²¹. It was shown that a decreasing in risk for melanoma may be related to a high diet in carotenoids (β -carotene included)^{22, 23}. The anti-oxidant supplementation was stopped after the incidence of melanoma declined thus supporting the idea that anti-oxidants are not necessarily beneficial to the treatment, or prevention of skin cancers²⁴.

Lycopene

One of the most common acyclic carotenoids is Lycopene and it is the pigment which is generally found in red and orange-fleshed fruits and vegetables. Watermelon (*Citrullus lanatus*), papaya (*Carica papaya*), tomato (*Solanum lycopersicum*), guava (*Psidium guajava*), grapefruit (*Citrus paradisi*)^{25, 26} are the examples of Lycopene. Lycopene As with β -carotene, lycopene blood levels of 30.9–40.8 $\mu\text{g/dL}$ on average has demonstrated no influence on the incidence of melanoma²⁷. In subjects with high serum levels of lycopene, the risk of melanoma is not significantly different from the risk in those with middle or low levels²⁸.

Vitamin E

A large number of studies were performed to determine the efficacy of vitamin E formulations as photo-protectants and chemo-protectants²⁹. It was found that a formulation, containing 0.3% of tocotrienols and 10% of tocopherols, resulted in a photo protective effect in humans when applied topically prior to UV exposure³⁰. To result in an increase in tumor burden in mice, topical vitamin E has been reported. In the same report, a formulation with both vitamin E (CE Ferulic®) and vitamin C resulted in a reducing of tumor burden in vivo. Vitamin E was

suggested as effective in late-stage tumorigenesis, as it affects tumor progression and not initial tumor growth³¹.

NATURAL SOURCES OF ANTI CANCER COMPOUNDS

Natural sources originate over 50% of all drugs available in the market, of which about 70% of anti-cancer agents have their origin in natural sources. Natural sources include plants, animals, microbes and marine life³².

Marine Sources

Extracts from algae, sponges, and marine cyanobacteria showed strong anti-cancer activities³³⁻³⁵. Some of the compounds like Laminarians, fucoidans, alginic acids, and carrageenans are isolated from marine sources that have been found to exhibit effective anti-cancer activities. Only there are four anti-cancer drugs of marine origin have reached the market so far. These drugs are trabectedin, cytarabine, eribulin mesylate and brentuximab vedotin, derived from *Cryptotethia crypta*, *Ecteinascidia turbinata*, and *Symploca hydroides*, respectively^{36, 37}. Also, some other examples of marine-derived compounds are there like Aplidin, bryostatin-1, salinosporamide and zalypsis that are currently undergoing clinical trials for potential use as anti-cancer drugs³⁸.

Microbial Sources

The groups of microbially derived anti-cancer compounds in clinical use are Anthracyclins, bleomycin, staurosporine and actinomycins^{39, 40}. Toxins from microorganisms can affect advantageously in humans, such as destroying rapidly dividing cells in tumors⁴¹.

Plant Sources

Some of the plants which are used in anti-cancer activity are shown in Table 1.

Table 1: Plant with anti cancer activity

S.No.	Plant Name	Active Constituent
1.	<i>Catharanthus roseus</i>	Vinblastine, Vincristine ^{42,43}
2.	<i>Glycyrrhiza glabra</i>	Glycyrrhizin ⁴⁴
3.	<i>Zingiber officinale</i>	Curcumin ⁴⁵
4.	<i>Allium Sativum</i>	Allicin(garlic) ^{46,47,48}
5.	<i>Zingiber officinale</i>	Gingerol ⁴⁹

RISK FACTOR

Ultraviolet Radiation

Genetic changes in skin cells may be caused by overexposure to ultraviolet radiation and also the production of very reactive chemicals, oxidants, in affected cells. Maybe induced. Tanning beds are a dangerous source of UV radiation⁵⁰.

Skin color & Sun Sensitivity

Fair skin is too susceptible to ultraviolet radiation damage⁵¹. Caucasians, specifically individuals with light eyes, freckles and or red hair, which is at higher risk of skin damage as a result of skin cancer, may be lead.

Drugs used to treat other illnesses

Thiopurine is a class of drugs which is used to treat inflammatory disease and some forms of cancer have been shown to increase risks for the development of non-melanoma skin cancer⁵².

Radiation Therapy

Radiation therapy is playing a major role in the treatment of primary cancers. High doses of radiation cause the cancers arise due to mutations in skin cells⁵³.

Chemical Exposure

One's risk of developing skin cancer may be increased by chronic exposure to arsenic, industrial tar and paraffin⁵⁴.

SIGN & SYMPTOMS OF SKIN CANCER

Cardiovascular

Blackfoot is a skin disease⁵⁵. It is caused in the foot; a black dot comes on foot that is a characteristic of Blackfoot.

Skin Lesions

Skin lesions are the most common effect of chronic exposure. It typically started about ten years after first exposure. Characteristics of skin lesions are Keratoses on the palms and soles. Mees' lines (transverse white lines on nails), hyperpigmentation or 'raindrop' pigmentation are also a type of skin lesions

CONCLUSION

In conclusion, the knowledge about anticancer medicinal plants of Indian and Foreign origin is provided by this article, which is used by all over the world. Health is kept and vitality of individuals and also various diseases including cancer without causing toxicity are cured by medicinal plants. Medicinal plants discovered many natural products which have played a very important role in the treatment of cancer. Some anti-cancer plants have been presented in this review. Good immunomodulatory and antioxidant properties leading to anticancer activity are possessed by these plants. Also, it is a significance exploiting novel anticancer drugs from medicinal plants. This review had told that some of the plants possessing anticancer activity for various types of cancer.

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