Integrative Approaches to Skin Cancer

Background

Skin cancer can be divided into two groups—melanoma and nonmelanoma. Most nonmelanoma skin cancers are either basal cell or squamous cell cancers.

Basal cell and squamous cell cancers are the most common forms of skin cancer. They typically occur on areas of the body exposed to ultraviolet (UV) radiation (from the sun or from tanning beds) or other forms of radiation. The damaging effects of UV radiation build over time, so greater lifetime exposure increases the risk of developing these types of cancers. Nonmelanoma skin cancers typically show up as red, scaly plaques or shiny pink to red papules that can be tender, bleed spontaneously and won't heal. These cancers grow very slowly and are generally easy to treat with surgery. However, if they are not treated, they can grow very large and, in rare circumstances, can spread to other parts of the body. Depending on the size and part of the body affected, treatment can include topical chemotherapeutic creams, surgery, and/or radiation.

Melanoma is a serious type of skin cancer and can occur anywhere on the body including areas that are never exposed to UV radiation. If caught late or left untreated, it can spread to other parts of the body. It is more common in fair-skinned people and can run in families. UV exposure is a common cause of melanoma, and intermittent high-intensity exposure is the most dangerous pattern of UV exposure for increasing the risk of developing melanoma. Melanoma typically shows up as a dark brown or black mole on the skin. Signs that a mole might be abnormal or might be a melanoma include the A, B, C, D, Es: Asymmetry, jagged or uneven Borders, multiple Colors, large Diameter (larger than the eraser on a pencil), and/or a mole that is Evolving or changing color or shape.

Warning signs of melanoma

Asymmetry: One-half of the mole looks different from the other

Border: Irregular or scalloped border

Color: Multiple colors—combination of reds, light browns, and very dark areas

Diameter: Greater than 6 mm (size of a pencil eraser)

Evolving: Any mole that is changing in size, shape, or color

If a spot is suspicious, a biopsy is needed to make the diagnosis. This involves surgically removing the affected area of skin. If a spot is found to be melanoma, the type of treatment depends on how deep the melanoma cells go into the skin. For very thin melanomas, simply

removing extra skin around the spot may be all that is needed. For thicker melanomas, the lymph nodes may need to be looked at to find out if any cancerous cells have spread into the blood stream. Chemotherapy and/or radiation may be options. These treatments can be very toxic, so it is important to work with a doctor or team of doctors to come up with the most appropriate treatment plan.

Prevention

The best way to prevent skin cancer is to minimize UV radiation exposure (from the sun or from tanning bed use). This can be accomplished by staying out of the sun in the middle of the day (10 a.m. to 2-4 p.m.), wearing protective clothing and wide-brimmed hats, using sunscreen with SPF 30 or above and reapplying it often (at least every 2 hours or after the skin has been wet), and avoiding tanning bed use. It is important to recognize that UV radiation can penetrate clouds and is reflected by snow, water, and sand, making the regular use of screens—even on cold, cloudy days—important.

Screening

Early detection is the most important factor in identifying and treating skin cancers. Many organizations, including the American Cancer Society, the American Academy of Dermatology, and the Skin Cancer Foundation, recommend regular skin self-examination.

People who have already had skin cancer or who are known to be at high risk for developing skin cancer should be evaluated regularly by a health care clinician.

Information and instructions on how to perform skin self-examination can be found through the American Academy of Dermatology website.[1]

Treatment

Treatment of skin cancers involves surgery or prescription-strength medications. Skin cancer is a serious condition, and people with skin cancer should be under the care of a physician. The following information is intended to be used to augment preventive efforts and/or to minimize the risk of recurrence.

Nutrition

Low-Fat, Anti-Inflammatory/Mediterranean Diet

There have been several studies looking at dietary fat and incidence of nonmelanoma skin cancers. Many of those studies suggest decreased rates of nonmelanoma skin cancer and precancerous lesions with lower dietary fat intake.[2-4] A large study evaluating the effects of a low-fat dietary intervention in over 48,000 postmenopausal women found that the rates of melanoma were significantly higher in women who had a higher baseline fat intake.[5] Additionally, following a Mediterranean-style diet—which tends to be lower in fats and animal proteins and higher in whole grains, fruits, and vegetables—appears to have protective effects against the development of melanoma.[6] More information about these dietary approaches can be found in the Integrative Health tool "Choosing a Diet."

Plant-Focused Diets
A variety of plant compounds have been found to have anti-melanoma properties both in vitro and in vivo. These include: fisetin, EGCG (from green tea), resveratrol, curcumin, proanthocyanidins, silymarin (from milk thistle), apignein, capsacin, genistein, indol-3-carbinol and luteolin.[7] While we don't have human studies and it is not clear if high dose supplementation of any of these compounds will have an impact on melanoma in humans, it makes sense that a diet rich in plant foods can only help minimize risk when it comes to melanoma. Additionally, a recent review examined the anti-cancer properties of several common herbs and demonstrated that curcumin, ginger, garlic, clove, rosemary, saffron and capsacin all have inhibitory effects on skin cancers.[8] Again, this data comes from laboratory settings and animal data, but has a high safety profile and these ingredients are easy to incorporate into food preparation.

Garlic and Onion
Animal studies support many anticancer effects of organosulfur compounds found in garlic and onions. The specific mechanisms that have been identified suggest likely usefulness for skin cancer.[9] However, there are no clinical human studies looking at the use of these compounds for skin cancer. Nevertheless, increasing these foods in the diet is safe and will likely offer protective benefit.

Omega-3 Fatty Acids
Omega-3 fatty acids have been shown to inhibit UV-induced inflammation and UV-induced carcinogenic changes in cells.[10,11] Omega-3 fatty acids have also been shown to inhibit growth and metastatic ability of melanoma cells in culture.[12] Ideally, omega-3 fatty acids would come from foods such as fatty fish (salmon, mackerel, and sardines), flaxseeds, and walnuts. When that is not possible, supplements can be helpful. The omega-3s found in flax are not as potent in terms of anti-inflammatory effects as those in fish oil. For more information, see the section on fats in the "Nutrition" Integrative Health overview.

Dose[13]:

- 1 tbsp of flax oil for every 100 lb daily
- 1-2 tbsp ground flaxseeds daily
- 1-2 mg fish oil (DHA + EPA) twice a day

Beta-Carotene
Beta-carotene is considered a provitamin because it is converted to vitamin A in the body. Several studies have found decreased rates of cancer in people who regularly eat foods rich in beta-carotene, but studies looking at actual blood levels of beta-carotene and supplementation in people with skin cancer have not shown benefit.[14] Foods rich in beta-carotene are a staple in anti-inflammatory and Mediterranean-style diets. These foods are high in other antioxidants as well as fiber—both of which are beneficial for many aspects of health.

Food sources: leafy greens, carrots, sweet potatoes, sweet peppers, dried apricots, peas, broccoli, squash, cantaloupe

Other Carotenoids
Lutein and zeaxanthin are carotenoids well-known for their protective effects on the eye. They also show great promise in skin cancer prevention. An Australian group of almost 300 people who had a history of skin cancer were given 2.9 mg of lutein and zeaxanthin daily for six months. Those who got the carotenoids had an almost 50% reduced risk of developing squamous cell carcinoma (SCC) in the subsequent 8-year follow-up. This result was not seen with basal cell cancer.[15]

Dietary sources of each include:

- Lutein: broccoli, spinach, kale, kiwi, orange pepper, grapes, zucchini, squash
- Zeaxanthin: kale, parsley, spinach, broccoli, peas

Polypodium leucotomos
Polypodium leucotomos extract comes from the rhizomes of a fern native to Central America and South America. It appears to enhance the body's own antioxidant system and prevents or minimizes UV induced DNA damage. It also appears to enhance the removal of photoinduced degradation products. [16] While this is theoretically promising, more research needs to be done with this botanical to better understand its potential role in preventing UV-induced skin cancer. At this point no clear dosing recommendations exist for skin cancer prevention.

Vitamins and Minerals

Note: Supplements are not regulated with the same degree of oversight as medications, and it is important that clinicians keep this in mind. Products vary greatly in terms of accuracy of labeling, presence of adulterants, and the legitimacy of claims made by the manufacturer.

Vitamin C
An inverse relationship between diets high in vitamin C–rich foods and skin cancer has been described.[17] Laboratory studies looking at the direct effects vitamin C has on skin cancer cells are promising, and topical vitamin C has been shown to protect against UV damage.[18] While vitamin C may have protective effects against the development of skin cancer, there are no clinical human studies to support a specific supplemental dose for people with skin cancer. In fact, the human studies that do exist looking at vitamin C as well as other antioxidants do not support these supplements having any measurable impact on skin cancer. However, it is likely that studies of this nature would require more than 10 years follow up and would be very costly and difficult to accomplish.

Interestingly, daily topical application of a saturated vitamin C preparation was used to treat one nodular and 6 superficial basal cell cancers. The preparation was applied to the affected skin and surrounding area and occluded for 12 hours for 22 weeks. The areas were biopsied and the nodular and 4 of the superficial basal cell cancers had no evidence of cancer remaining. An 18-month follow-up revealed that one of the superficial skin cancers had recurred but the other four sites remained clear.[19] This is a small study, but this preliminary data indicates a need for additional, more-detailed study.

Food sources: sweet peppers, broccoli, citrus fruits, berries, tomatoes, dark leafy greens

Vitamin D
Vitamin D in skin cancer patients is particularly tricky to study. UV exposure-the strongest modifiable risk factor for the development of skin cancers-results in increased levels, so looking at levels in these populations can be difficult to interpret. Vitamin D has been shown to have harmful effects on skin cancer cells in the laboratory, and there is some evidence that people with melanoma may have lower blood levels of vitamin D.[20] Additionally, higher vitamin D levels have been correlated with a decreased risk of melanoma in some studies.[21] A relationship between vitamin D levels and nonmelanoma skin cancers has not been proven in human clinical studies. Given the implications vitamin D deficiency has on other health conditions, a patient's vitamin D level should be checked, and low levels should be appropriately supplemented orally.

Dose[22]:

- 600 IU/day for supplemental uses
- 1,000 IU/day for treatment of vitamin D deficiency
- 4,000 IU/day is current suggested upper limit*

*More recent research suggests that doses up to 10,000 IU/day are safe and that the upper limit should be set at this level.[23] Above 10,000 IU/day, a person should be in the care of a physician and monitored for signs of vitamin D toxicity, which include hypercalcemia (headache, nausea, vomiting, abdominal pain, increased urination, and thirst).

Food sources: fatty fish, fortified foods, beef liver, egg yolk, cheese

Botanicals

Green Tea
Green tea contains epigallocatechin-3-gallate (EGCG), which has proved to have many anticancer effects in laboratory experiments and in animal studies. Both oral and topical preparations have been studied and appear to have benefit.[24] Beneficial effects have been more promising in melanoma models but are also present in nonmelanoma models.[18] Clinical studies in humans are lacking and an ideal dose is not known, but green tea is easily accessible, safe, and inexpensive.

- **Suggestion:** Drink 2 or more cups of green tea daily.

Turmeric (Curcumin)
Curcumin is the major active component of turmeric. It has strong anti-inflammatory as well as anticarcinogenic properties.[14] It has been shown to result in a dose-dependent decrease in growth of squamous cell cancer in vitro.[25] Additionally, curcumin has been shown to decrease lung metastasis in mice by 80%![26] There have been no studies in humans, and an ideal dose for skin cancer is not known. Curcumin can be obtained in the diet or by taking capsules of turmeric powder. Clinical studies have found it safe at doses up to 8-12 gm/day with the only side effects being reversible gastrointestinal problems (nausea and diarrhea).[27]

Prevention Summary: Skin Cancer

- Practice UV protection:
  - Avoid midday sun exposure (10 a.m. to 2-4 p.m.).
  - Wear protective clothing and wide-brimmed hats.
  - Use sunscreen with SPF 30 or above and reapply often—at least every 2 hours or after the skin has been wet.
  - Avoid tanning bed use.
- Practice monthly skin self-examination with appropriate health care provider screening.
- Eat a low-fat diet with lots of vegetables, fruits and spices, including garlic, onion, turmeric, and foods that contain a lot of beta-carotene, carotenoids, and vitamin C.
- Consider increasing fish intake or taking an omega-3 supplement.
- Drink green tea.
- Consider vitamin D supplementation.
- Consider increasing turmeric/curcumin in diet or taking as a supplement.

Resource Links

- American Academy of Dermatology: https://www.aad.org/public/diseases/skin-cancer/find/check-skin
- Choosing a Diet: https://www.fammed.wisc.edu/files/webfm-uploads/documents/outreach/im/tool-choosing-a-diet.pdf
- Nutrition: https://www.fammed.wisc.edu/integrative/resources/modules/nutrition-nourishing-fueling/
- *Passport to Whole Health*: https://www.va.gov/WHOLEHEALTHLIBRARY/docs/Passport_to_WholeHealth_FY2020_508.pdf

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