Skin Cancer

Education for Patients and the Public

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Abstract

Skin cancer is the most common form of cancer worldwide, arising from uncontrolled cell growth in the skin's layers. This disease can develop due to prolonged exposure to ultraviolet (UV) radiation, genetic predisposition, or other risk factors. This guide provides a detailed overview of skin cancer, explaining its causes, types, symptoms, diagnosis, and treatment. Written in straightforward terms, it aims to educate the public, patients, and caregivers, offering practical advice for prevention, treatment, and living with the disease.

Introduction

Skin cancer develops when skin cells grow abnormally and out of control, often due to exposure to UV radiation from the sun or artificial sources like tanning beds. While early

detection and treatment can result in a high cure rate for many cases, some forms of skin cancer, such as melanoma, can be life-threatening. Understanding skin cancer is crucial for recognizing warning signs, seeking timely medical care, and adopting preventive measures. This article aims to provide comprehensive information to help readers navigate this condition (1-3).

What is Skin Cancer?

Skin cancer occurs when the DNA in skin cells becomes damaged, leading to mutations that cause these cells to multiply uncontrollably. The skin is the body's largest organ, and its primary function is to protect against external harm. However, prolonged exposure to harmful factors such as UV radiation can cause abnormal changes in skin cells, resulting in cancer. Skin cancer can occur in any part of the body but is most commonly found in areas frequently exposed to the sun, such as the face, neck, and arms. Early-stage skin cancers are usually treatable, but some forms can spread to other parts of the body, making early detection critical.

Epidemiology of Skin Cancer

Skin cancer is the most frequently diagnosed cancer globally, with millions of cases reported each year. The disease affects individuals of all ages, genders, and ethnicities, though fair-skinned individuals are at higher risk due to lower levels of protective melanin. The incidence of skin cancer is highest in regions with intense sun exposure, such as Australia, New Zealand, and parts of the United States. Basal cell carcinoma and squamous cell carcinoma, both non-melanoma skin cancers, are the most common types, while melanoma, though less common, accounts for the majority of skin cancer-related deaths. Public health campaigns promoting sun protection and early screening have been crucial in addressing this widespread health concern.

Types of Skin Cancer

Skin cancer is classified into three main types based on the cells where the cancer originates. Basal cell carcinoma arises from the basal cells at the bottom of the epidermis and is the most common and least aggressive type. Squamous cell carcinoma develops in the squamous cells closer to the skin's surface and has a slightly higher risk of spreading to other parts of the body. Melanoma, the most serious form of skin cancer, originates in melanocytes, the cells that produce pigment. Melanoma is more likely to spread to other organs, making it the most dangerous type of skin cancer. Other rare forms include Merkel cell carcinoma and Kaposi sarcoma.

Risk Factors and Causes of Skin Cancer

Several factors increase the risk of developing skin cancer. The primary cause is prolonged exposure to UV radiation from the sun or artificial sources like tanning beds. Fair-skinned individuals, particularly those with light hair and eyes, are more susceptible due to lower levels of melanin. A history of sunburns, especially during childhood, significantly raises the risk. Genetic predisposition also plays a role, with mutations in genes such as CDKN2A and MC1R linked to higher melanoma risk. Immune suppression, caused by medications or conditions like HIV/AIDS, further increases vulnerability. Occupational exposure to chemicals like arsenic and a family history of skin cancer are additional contributing factors.

Symptoms of Skin Cancer

Skin cancer often begins with noticeable changes in the skin's appearance. Basal cell carcinoma may present as a pearly or waxy bump, a flat lesion, or a sore that does not heal. Squamous cell carcinoma commonly appears as a firm, red nodule or a scaly, crusted lesion. Melanoma

typically manifests as an irregularly shaped mole or dark spot that changes in size, color, or texture. The ABCDE rule—Asymmetry, Border irregularity, Color variation, Diameter larger than a pencil eraser, and Evolution over time—is a useful guide for identifying potential melanomas. Itching, bleeding, or tenderness may also occur in advanced stages.

Pathophysiology of Skin Cancer

Skin cancer develops when UV radiation damages the DNA in skin cells, leading to mutations that disrupt normal cellular processes. The basal and squamous cells in the epidermis, as well as melanocytes, are most commonly affected. Mutations in genes such as TP53 and PTCH1 in basal and squamous cell carcinomas, and BRAF or NRAS in melanoma, drive abnormal cell growth and survival. Over time, these cancerous cells evade the body's immune response, invade surrounding tissues, and, in some cases, metastasize to distant organs. The type of mutation and the cell of origin determine the behavior and severity of the cancer.

Diagnosis of Skin Cancer

Diagnosing skin cancer involves a combination of visual examination, biopsy, and imaging studies. A dermatologist typically evaluates suspicious skin lesions using dermoscopy, a tool that magnifies and illuminates the skin. If cancer is suspected, a biopsy is performed to remove a sample of the affected tissue for microscopic analysis. This confirms the type and stage of the cancer. For advanced cases, imaging techniques like CT scans, MRIs, or PET scans may be used to assess the extent of the disease and check for metastasis. Early detection is key to improving outcomes and reducing the need for aggressive treatments.

Complications of Skin Cancer

If left untreated, skin cancer can lead to serious complications. Basal and squamous cell carcinomas can grow into nearby tissues, causing disfigurement and functional impairment, particularly when located on the face or hands. Melanoma has a high potential for metastasis, spreading to the lymph nodes, lungs, liver, or brain, which significantly worsens the prognosis. Advanced skin cancer can result in chronic pain, infection, and psychological distress. Treatments like surgery, chemotherapy, and radiation may also cause side effects, including scarring, fatigue, and immune suppression.

Treatment and Management of Skin Cancer

The treatment of skin cancer depends on its type, stage, and location. Surgical options, such as excision or Mohs surgery, are commonly used to remove cancerous tissue, often with minimal scarring. Cryotherapy, which involves freezing cancer cells, is effective for small, superficial lesions. Radiation therapy may be used for cancers in difficult-to-operate areas or for advanced cases. Chemotherapy creams like fluorouracil (Efudex) are sometimes applied directly to affected skin. Targeted therapies, such as vemurafenib (Zelboraf) for melanoma with BRAF mutations, and immunotherapies like pembrolizumab (Keytruda), which boost the immune system to fight cancer, offer promising results for advanced cases. Regular follow-ups and lifestyle changes, including sun protection, are integral to managing skin cancer.

Prognosis of Skin Cancer

The prognosis for skin cancer varies widely depending on the type and stage of the disease. Basal cell carcinoma and squamous cell carcinoma, when detected early, have excellent cure rates with minimal impact on long-term

health. Melanoma, particularly when diagnosed at an advanced stage, has a less favorable prognosis due to its high potential for metastasis. Survival rates for melanoma are significantly higher when it is confined to the skin. Advances in targeted therapies and immunotherapies have improved outcomes for many patients with advanced melanoma, offering hope for longer survival and better quality of life.

Living with Skin Cancer

Living with skin cancer involves addressing physical, emotional, and lifestyle challenges. Patients often need to manage the effects of treatment, including skin sensitivity, scarring, and fatigue. Emotional support from counselors, support groups, and loved ones is crucial for coping with the psychological impact of the diagnosis. Practicing vigilant sun protection, including wearing sunscreen and protective clothing, helps prevent recurrence. Regular skin checks by a dermatologist are essential for monitoring new or changing lesions. Staying informed about advancements in treatment and participating in clinical trials may provide additional options for those with advanced or recurrent skin cancer.

Conclusion

Skin cancer is a preventable and treatable disease when detected early. Understanding its causes, symptoms, and treatment options is vital for improving outcomes and reducing its burden. Advances in medical treatments and public awareness campaigns are helping more people recognize and address skin cancer effectively.

References

1. Apalla Z, Lallas A, Sotiriou E, Lazaridou E, Ioannides D. Epidemiological trends in skin cancer. Dermatol Pract Concept. 2017 Apr;7(2):1-6. https://doi.org/10.5826/dpc.0702a01

2. Hu W, Fang L, Ni R, Zhang H, Pan G. Changing trends in the disease burden of non-melanoma skin cancer globally from 1990 to 2019 and its predicted level in 25 years. BMC Cancer. 2022 Jul 11;22(1):741. https://doi.org/10.1186/s12885-022-09940-3
3. Stratigos A, Garbe C, Lebbe C, Malvehy J, del Marmol V, Pehamberger H, et al. Diagnosis and treatment of invasive squamous cell carcinoma of the skin: European consensus-based interdisciplinary guideline. Eur J Cancer. 2015 Sep;51(14):1989-2007. https://doi.org/10.1016/j.ejca.2015.06.110

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