

## **REVIEW**

# **Skin cancer: Etiology and management**

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**Abstract:** Nowadays, occurrence of skin cancer is very common in humans. It is reported that the most common cause of the skin cancer is excessive exposure to sunlight as it contains harmful radiations; the ultra violet rays. Different management strategies are used for different types of skin cancers, which are chemotherapy, radiation therapy.

**Keywords:** Skin Cancer, Chemotherapy, Radiations, Epidermis

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## **INTRODUCTION**

Development of cancers usually results when the DNA gets damaged and our body is unable to recover this damage. These damaged cells begin to grow and divide uncontrollably. Such changes in the skin lead to skin cancer. As the damaged cells multiply, they form a tumor (Gloster and Brodland, 1996). Skin cancer develops in different layers of the skin usually of epidermis, so this is easily detectable (Silverberg *et al.*, 1990)

The tendency to develop skin cancer varies for different skins. Its occurrence is different on the basis of skin color and type of skin but usually occurs in the skin, which is exposed to sunlight (Miller and Weinstock 1994). Moreover the hereditary factors also contribute towards the development of skin cancer (Holme *et al.*, 2000; Buetter and raasch, 1998).

### ***Types of skin cancer***

There are three types of skin cancers, which accounts for almost 100% of diagnosed cases. Each of these three cancers develops in a different type of skin cell and each is named after the name of cell (Gloster and Brodland, 1996). Skin cancers are divided into two categories - non-melanoma skin cancer and melanoma skin cancer. Melanoma is the most dreadful form of skin cancer.

Different types of skin cancer are:

### ***Basal cell carcinoma (BCC)***

BCC is the most common type of cancer that gets develop in most of the human population (Green *et al.*, 1996). BCC comprise about 80% of all the cancers. It may be defined as the cancer that develops in the specified skin cells called the basal cells, which are present in the lowest layer of the skin epidermis. This type of tumor when heals then it may get appear again. Usually it gets red color spots. The most common sites for the

appearance of this type of cancer are face and scalp. The rate of growth of these cancers is very slow but they have the ability to get spread in other parts of the body.

### ***Squamous cell carcinoma (SCC)***

Occurrence of this type of cancer is less as compared to BCC. It may be defined as the type of cancer that gets develop in the squamous cells of the skin (Green *et al.*, 1996). This cancer mostly develops on the dry and rough parts of skin however it can easily be develop on those areas which are mostly exposed to the sun light. It appears in the form of red or blackish yellow spots. Like BCC it can also spread to other parts of the body but various type of treatments have be evolved to prevent its spread to other parts of the body (Kaldor *et al.*, 1993)

### ***Melanoma***

This type of tumor appears very rarely. It may be defined as the type of cancer that develops in the skin cells called melanocytes (Green *et al.*, 1996). Although it occurs rarely but it is most lethal among all the cancers because it can also spread through the lymphatic system. (Kaldor *et al.*, 1993), (Serrano *et al.*, 1991). It occurs in all age groups but elder people get more affected by this type (Mackie *et al.*, 1998). As this type of cancer can be diagnosed early so can lead towards the effective treatment. Usually melanoma develops in already existing infiltrator or it gives the appearance like an infiltrator.

Some other uncommon types of cancer are also seen but are diagnosed in very less cases. Examples include lymphoma.

### ***Signs and symptoms***

Different types of changes occur as the cancer develops in the skin which gives rise to a variety of different symptoms. Changes that occur in the skin involve ulceration and color fadedness of the skin, and it may result in the increased size of the mole. However symptoms may vary in different types of cancers.

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Usually BCC appears as swelled smooth surface most often on neck and shoulders (Kaldor *et al.*, 1993). More often blood vessels are also seen in the tumor. These blood vessels results by the process of angiogenesis that is required by the tumor cells to grow in the skin. Development of tumors is usually accompanied with bleeding from the centre of the tumors but these type of cancers can be treated completely (Serrano *et al.*, 1991).

SCC appears in the form of nodules and these nodules are hard in appearance. This type of cancer also results in the ulceration of the skin and bleeding from tumors. If it goes un-treated then it results into larger masses (Miller and Weinstock, 1994). Merkel cell carcinomas are usually taken as cyst form because of its features that it is painless red spot (Kaldor *et al.*, 1993).

### ***Causes of skin cancer***

Mostly cancers develop due to excessive exposure to sun so can be easily prevented by preventing the exposure to sun (Gloster and Brodland, 1996), (Miller and Weinstock, 1994). It came to know that sunlight comprises of ultra violet rays which are harmful to skin and damages to the DNA. Before the body could recover this damage mutation occurs in the genes and damage becomes irreparable.

Apart from environmental factors genetic history of patient can also be a cause for development of cancers. And the most common type of cancer that is being inherited is melanoma (Green *et al.*, 1996).

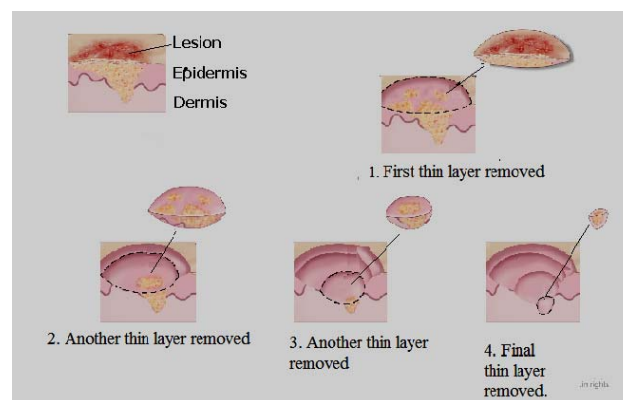
### ***Prevention***

It's not possible to completely eradicate the cancers however precautions can be taken to prevent the development of cancers. Following measures should be taken: First of all there should be reduced exposure to sun light, use of tobacco should be avoided, sun screens should be used to prevent the exposure to UV rays, sun block should be used (Lin *et al.*, 2011). Skin cancer cell can also be removed by biopsy (Dodson *et al.*, 1991).

### ***Management***

The emergence of resistance and tolerance to the existing drugs has created a decreased efficacy of these drugs in use. This problem has been tried to be overcome by increasing the drug delivery to the target site by the use of polymers (Khalid *et al.*, 2009; Hussain *et al.*, 2011) or through nanotechnology (Naz *et al.*, 2012; Ehsan *et al.*, 2012), synthesis of new drugs, either by the use of proteomics (Qadir, 2011; Qadir and Malik, 2011), or synthesis from lactic acid bacteria (Masood *et al.*, 2011), or marine microorganisms (Javed *et al.*, 2011). However, now a days, the trend is being changed from synthetic drugs to the natural drugs either from plants or microbes to control the diseases (Iqbal *et al.*, 2014). The natural products are constantly being screened for their possible

pharmacological value particularly for their analgesic (Parveen *et al.*, 2014) anti-inflammatory (Qadir, 2009), hypotensive (Qadir, 2010), antihyperlipidaemic (Ahmad *et al.*, 2012) hepatoprotective (Ali *et al.*, 2013; Mallhi *et al.*, 2014; Saleem *et al.*, 2014a; Qadir *et al.*, 2014), hypoglycaemic (Nisa *et al.*, 2009; Qadir and Malik, 2010), amoebicidal (Asif and Qadir, 2011), anti-fertility, cytotoxic (Saleem *et al.*, 2014b), antimicrobial (Amin *et al.*, 2012; Azam *et al.*, 2013; Saleem *et al.*, 2014c), spasmolytic (Janbaz *et al.*, 2014), bronchodilator (Janbaz *et al.*, 2013a), antioxidant (Janbaz *et al.*, 2012), anti-diarrheal (Janbaz *et al.*, 2013b), anti-cancer (Saleem *et al.*, 2013) properties.



**Fig. 2:** Treatment of skin cancer by surgery

Different type of treatments are carried out for different type of tumors. The treatment of skin cancer varies from type of cancer, location and age of patient. It also depends upon whether the tumor is primary or secondary (Gloster and Brodland, 1996; Boring *et al.*, 1991). Before starting the treatment, type of cancer must be diagnosed and known to the doctor (Boring *et al.*, 1991). For example the treatment of BCC that appears on the cheek of a young person can be treated with surgery but if the same type of cancer develops in a person who is elder in age then surgery is not carried out. Chemotherapy i.e. treatment by using medications can also be carried out in the treatment of large masses of BCC (Garland *et al.*, 1992). But this type of treatment by using anticancer drugs is not sufficient when the nature of the tumor is invasive and is in the form of nodules as in case of squamous cell carcinoma. While taking in account melanoma, this type of treatment is insufficient because melanomas are not sensitive to anti cancer drugs and radiation therapy (Westerdahl *et al.*, 2000).

For such type of cancers that have lower risk of the diseases can be treated by chemotherapy and radiation therapy because these treatment procedures provide sufficient control of the disease but the curing rates of these treatments are not comparable with the surgery (Autier *et al.*, 1995). When the spread of tumor is intensive then the choice of treatment is surgery. Surgery

**Table 1:** Comparison of different types of skin cancer

TYPES	Description	Appearance	Severity	Occurrence
Basal cell carcinoma	Develops in basal cells of skin epidermis	Non-lethal, open sore, small pink growth	Less severe than other 2 types	Most widely occurred cancer
Squamous cell carcinoma	Develops in the squamous cells of the skin.	Just like warts Scaly patches pen sores	More severe than basal cell cancer	Less occur than basal cell carcinoma
Melanoma	Develops in the skin cells called melanocytes	Multi-coloured, asymmetrical, size may reach 6mm	Most severe type, termed as deadly skin cancer	It occurs rarely

is carried out to remove cancer cells in the skin along with the small area of tissue (Weinstock *et al.*, 1999), (Vainio and Bianchini, 2000). Particular training is required to carry out such operations. In some cases along with surgery use of anti cancer drugs is made necessary.

Most recent techniques involve strengthening the body immune system so that it will be not susceptible or prone towards the development of cancers (Ainsleigh *et al.*, 1993).

### Surgery

Nowadays, surgical removal is the most common method employed for the treatment of cancers (Karagas *et al.*, 2010). This treatment results in the normal appearance and the normal function of the body cells (Walter *et al.*, 1999). This technique had the hesitations in case of skin cancers due to the presence of visible structures on the face.

This type of treatment may result in various skin defects most commonly skin scars (Gilchrest *et al.*, 1999). This problem can be resolved by skin grafting in which a piece of skin is removed from other part of body and is placed from the affected area (Pfahlberg *et al.*, 2001). This graft must be kept immobilized so that it can heal easily (Hanson *et al.*, 2006).

### CONCLUSION

Skin cancer is one of the most common cancers in the world as the environmental changes occurred which resulted in the exposure of skin to ultraviolet rays. Apart from the environmental causes, genetic history is also a common cause behind rising skin cancers. Three types of skin cancers are common Basal Cell Carcinoma, Squamous Cell Carcinoma and Melanoma. All the types have different dynamics and different treatments on the basis of age and location of the patient. Anti-cancer medication, chemotherapy, radiotherapy and surgery are the possible treatments of the skin cancers. Surgical removal is common in these days but it requires special attention after the surgery.

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