

A Review Article On: Exploring Herbal Options In The Management Of Skin Cancer.

Author: UndeAbhijeetRajendra

Guided by: Prof. Kalpana S. Kale

Principal: Dr Megha T. Salve

Department of bachelor of pharmacy, Shivajirao Pawar College of pharmacy, Pachegoan Ahmednagar, 413725

Submitted: 15-11-2023

Accepted: 25-11-2023

ABSTRACT – Skin cancer is one of the most dangerous forms of Cancer in all over the world. In this day, the skin Cancer is mostly diagnosed using visual inspection. The Cancer cells are spread to all over the body and it infect by the other newer cells. Our oldest description of cancer was discovered in Egypt and date back to about 3000BC. In Ancient times the Hakims treated the cancer by herbal surgical treatment, but they gives the less therapeutic effect , Then as time changed then the physician who has knowledge they prepared the synthetic medicines , The synthetic medicine are derived by chemicals synthesis so they are chemically prepared medicine. But synthetic medicine are helpful to treat or inhibit the action of skin cancer cells but gives much more side effects. So, In this review we will study about herbal medicine (drugs) that are helpful to treat or inhibit the skin cancer. The skin cancer mainly occur due to exposure of sun light , by the research of many physicians they states that the ultraviolet radiation (UVR) is the major etiology agent in the development of skin cancer .

The Cancer immunotherapy word derived by William Bradley Coley. “Melanin” the protective pigment is the outer layer of skin from ultraviolet light , then our body produces less melanin or deficiency of melanin then develop most forms of skin cancer.

So, The herbal medicine that enhance immune system then they affect slowly but inhibit the action of skin cancer spreading cells ,also herbal drugs have less side effect as compare to synthetic medicine. The purpose of present review is to outline types, pathogenesis, diagnosis, prevention and treatment of skin cancer.

KEYWORD- Skin cancer, Herbal drug therapy, deep leaning, Active API, Immunotherapy

I. HISTORY –

The differentiation of melanoma basal cell and squamous cells carcinoma took place in the time of the turn of the 19th century.

1)Laennac made the first description of melanoma in 1804

2)first time in 1806 the French physician

3)Rene Theophile Hyacinth Laennec (1781-1825), known as the inventor of the aus-cultation, described the black tumors as an autonomous disease.

4)Jacob of basal cell carcinoma in 1827,

5)Bowen of squamous cell carcinoma in situ in 1912.

6)1928 that the first sunscreen became available

7)In 2012, vismodegib was approved for the treatment of metastasized or advanced basal cell carcinomas.

The earliest known descriptions of cancer can be traced back to ancient Egypt, as evidenced by several papyri. These ancient texts provide insights into the disease, including its occurrence in the head and neck region, where cancer cells were found causing destruction to the bony skull. The oldest known description of cancer dates back to approximately 3000 BC and originates from Egypt. It was during the time of the Greek physician Hippocrates (460-370 BC) that the disease was first referred to as cancer. Hippocrates, often hailed as the Father of Medicine, made significant contributions to the field. Subsequently, the Greek word for cancer was converted to the Latin word for crab by the Roman physician Celsus (28-50 BC).

Advancements in medical knowledge continued to evolve over the centuries. In the 16th and 17th centuries, doctors began to dissect bodies in order to gain a deeper understanding of the causes of death, which contributed to the growing acceptance of such practices. It was not until the 19th century that Rudolf Virchow, a prominent figure in medical

research, conducted studies on cancer cells under the microscope, furthering our understanding of the disease.

Another significant milestone in the history of cancer research occurred in 1896 when Wilhelm Conrad Roentgen, a German physics professor, discovered radiation therapy. This development

opened up new possibilities for the treatment of cancer.

Overall, the study of cancer has a rich history that spans across different civilizations and time periods. From ancient Egypt to the modern era, numerous individuals have contributed to our understanding of this complex disease.[1]

Table No -1History

1940	No Treatment
1955	Before surgery
1955-1965	Radiotherapy
1965	After chemotherapy

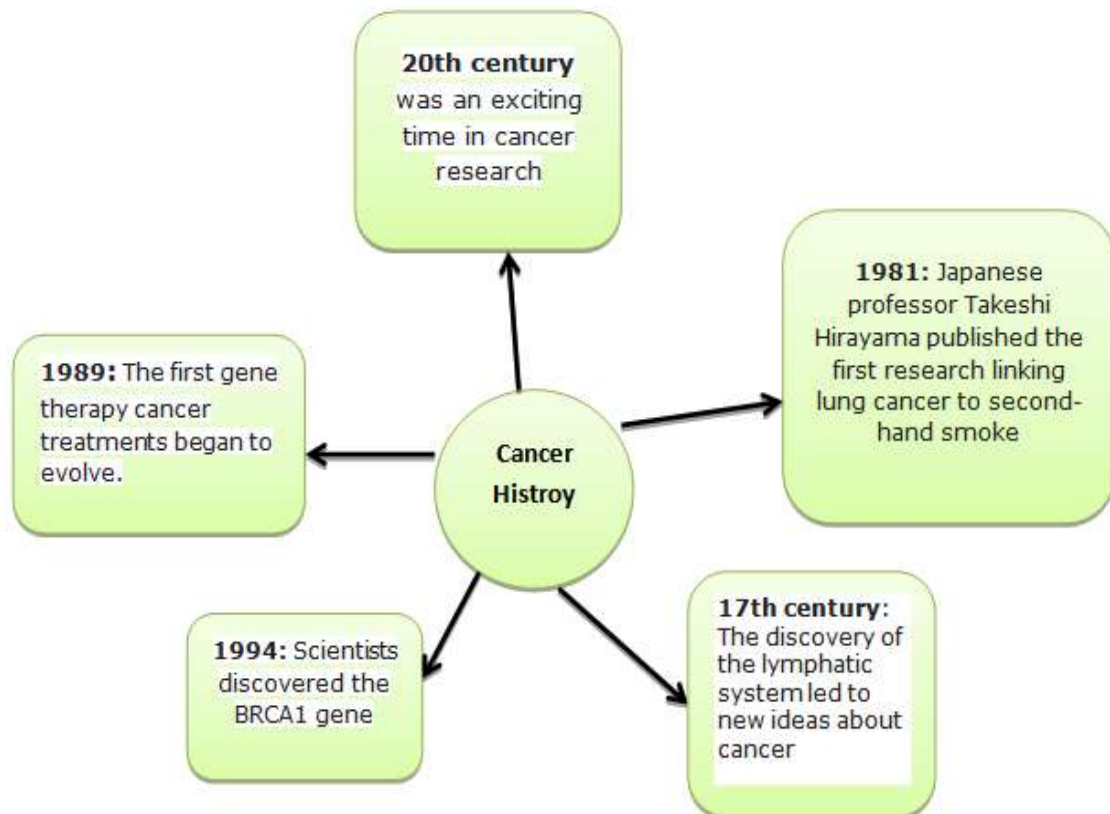


Chart No-1

II. INTRODUCTION

Cancer is a medical condition that is distinguished by the unregulated proliferation and dissemination of specific cells within the human body. It has the potential to arise in multiple sites within the body, given its composition of an extensive number of cells.. Under normal circumstances, human cells undergo a process known as cell division to generate new cells as

needed. Aging or damaged cells are naturally replaced by new ones.

However, there are instances when this orderly process malfunctions, leading to the abnormal and excessive growth of damaged cells. These cells may form tumors, which are masses of tissue. Tumors can be either cancerous or non-cancerous (benign).

Cancerous tumors have the ability to invade nearby tissues and can even metastasize,

spreading to distant parts of the body and forming new tumors. These tumors are often referred to as malignant tumors. While many cancers manifest as solid tumors, blood cancers like leukemias typically do not.

On the other hand, benign tumors do not invade nearby tissues. When surgically removed, benign tumors generally do not reoccur, unlike cancerous tumors which may regrow. However, it is important to note that benign tumors can sometimes grow to a significant size and cause severe symptoms or pose a threat to life, such as in the case of benign brain tumors.

Differences between Cancer Cells and Normal Cells

Cancer cells exhibit several distinct characteristics compared to normal cells. Firstly, they possess the ability to grow autonomously, disregarding the absence of growth signals that are typically required for normal cell growth. Conversely, normal cells only proliferate in response to these specific signals.

Additionally, cancer cells exhibit a resistance to signals that would typically prompt cells to cease dividing or undergo programmed cell death, also known as apoptosis. This resistance allows cancer cells to continuously divide and accumulate, leading to the formation of tumors.

Furthermore, cancer cells possess the capability to invade neighboring tissues and metastasize to distant areas within the body. In contrast, normal cells cease growth upon encountering other cells and generally remain stationary.

Moreover, cancer cells possess the ability to induce the growth of blood vessels towards tumors. These newly formed blood vessels supply tumors with essential oxygen and nutrients while eliminating waste products from the tumor.

Another distinguishing feature of cancer cells is their ability to evade detection by the immune system. Normally, the immune system identifies and eliminates damaged or abnormal cells. However, cancer cells have developed mechanisms to evade immune surveillance.

Furthermore, cancer cells can manipulate the immune system to their advantage. For instance, certain cancer cells can deceive immune cells into protecting the tumor instead of attacking it, thereby promoting their own survival and growth.

In summary, cancer cells possess a range of characteristics that differentiate them from normal cells. These include autonomous growth, resistance to signals that regulate cell division and death, invasive behavior, manipulation of blood vessel growth, evasion of the immune system, and exploitation of immune cells for their own benefit.

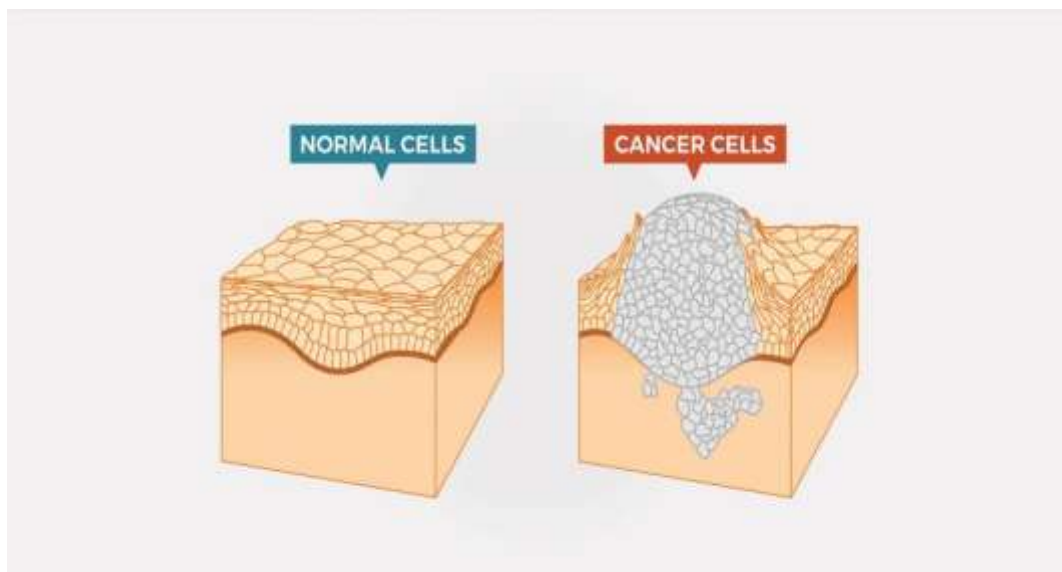


Fig No -1

When Cancer Spreads

Metastatic cancer denotes the dissemination of cancerous cells from their primary

location to various regions within the body. The process of cancer cells spreading to other areas is known as metastasis. The cancer cells in metastatic

cancer are the same type as the primary cancer. For instance, if breast cancer spreads to the lungs, it is still considered metastatic breast cancer, not lung cancer.

Under a microscope, metastatic cancer cells appear similar to the cells of the primary cancer. Additionally, they often share molecular features, such as specific chromosome changes.

While treatment may prolong the lives of individuals with metastatic cancer in some cases, the primary objective is often to manage the cancer's growth or alleviate symptoms. Metastatic tumors can cause significant harm to the body's functioning, and most cancer-related deaths are due to metastatic disease.

Metastasis

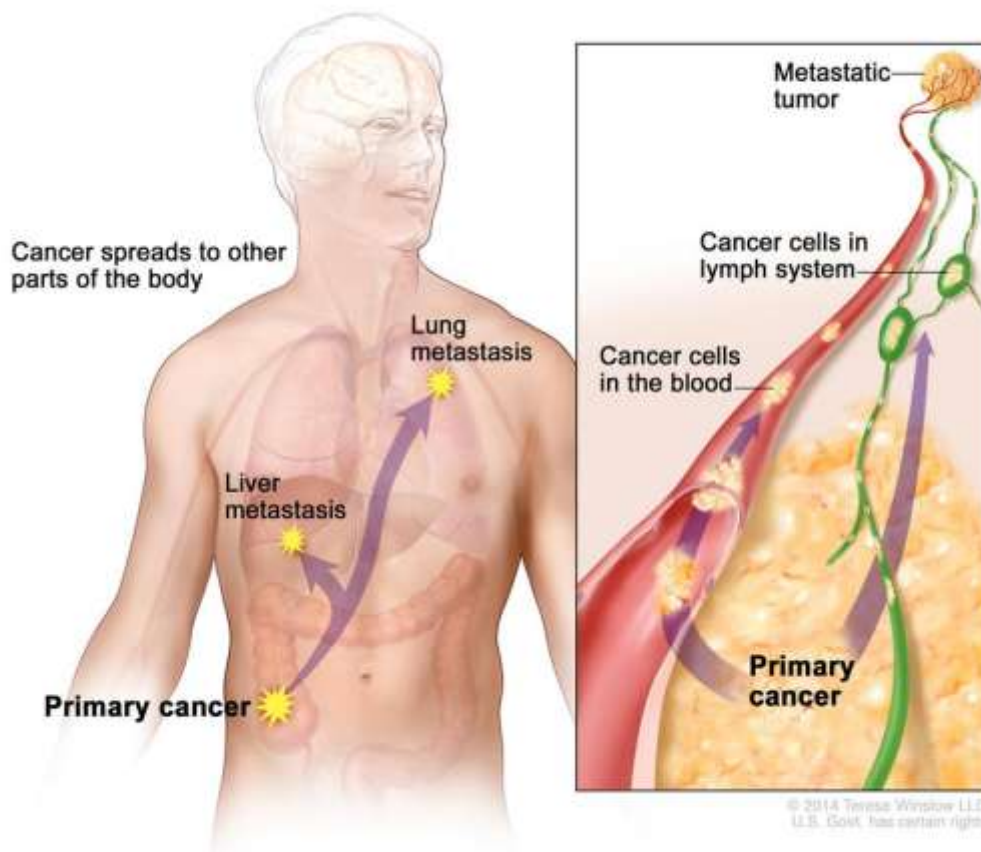


Fig No -2

Chronic cancer

In certain cases, cancer may not be curable through complete treatment. This implies that the cancer cannot be eradicated entirely, although it may not advance rapidly. Although some cancers may disappear temporarily, they may reappear and be treated effectively once again.

However, it is feasible to manage the cancer for several months or even years. This necessitates continuous treatment to prevent the cancer from advancing for as long as feasible.

Pathophysiology of Cancer

Pathophysiology is the amalgamation of two medical terms, namely pathology and physiology. Pathology encompasses the study of structural and functional alterations in cells, tissues, or organs caused by specific diseases. Conversely, physiology delves into the functions of the human body. Consequently, pathophysiology can be defined as the examination of fundamental changes in the body's physiology resulting from a disease.

For example, the pathophysiology of a tumor investigates the underlying changes in the body that arise from the presence of a tumor or the metastasis of cancer cells. Thus, the

pathophysiology of cancer encompasses the physical and hormonal changes associated with cancer and paraneoplastic syndrome. Generally, cancer manifests in four primary stages. The pathological stage of cancer is determined through biopsy, wherein a small body tissue is extracted for laboratory examination, allowing for a comparison between cancerous cells and normal cells. The four main stages of cancer are as follows:

- Stage 1 — Cancer is typically localized in a small area.
- Stage 2 — The size of the cancer increases.
- Stage 3 — The size of the cancer becomes larger and begins to spread to various parts of the body, including lymph nodes.
- Stage 4 — Cancer has grown extensively and has spread to most parts of the body.

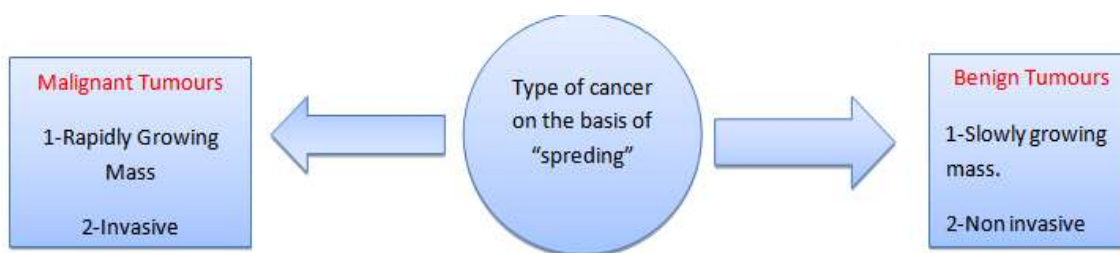


Chart No -2

Cancer with Herbal Drugs-

Table No-2

Name of cancer	Herbal Drug Used
Skin cancer	Tulsi , Turmeric, Neem, Bilberry,Aloevera, Genger,Sesame,Sunflower seeds
Kidney Cancer	Astragals, Turmeric, Green Tea
Lung Cancer	Astragals, Turmeric, Green Tea,Ginseng,Liquorice
Intestinal Cancer	Ginger, Garlic,Curcumin, Green Tea
Eye Cancer	Garlic, Aloe vera,Curcumin, Green Tea, Calemdula

Chemotherapy-Chemotherapy is a form of cancer treatment that involves the use of medication to eliminate cancer cells. Unlike normal cells in the body that grow and die in a regulated manner, cancer cells continue to grow uncontrollably. Chemotherapy functions by destroying cancer cells, preventing their spread, or reducing their growth rate. This treatment is utilized to cure cancer, reduce the likelihood of its recurrence, or impede its growth. Additionally, chemotherapy can alleviate cancer symptoms by reducing the size of tumors that cause discomfort and other complications.

Chemotherapy is the administration of drugs to eliminate pathogenic organisms or neoplastic cells in the treatment of infectious diseases or cancer. It is based on the principle of selective toxicity, where the drugs specifically target and inhibit vital functions of invading organisms or neoplastic cells that differ from those of host cells.[2]

The term "Chemotherapy" was coined by German chemist Paul Ehrlich, who pioneered the use of drugs to treat infectious diseases. He was

also the first researcher to utilize animal models to screen a range of chemicals for their potential effectiveness against diseases. Historical records suggest that the use of arsenicals began in the 1900s.

However, as the presence of micro metastases and cancer recurrence after surgery and radiation treatment became apparent, combination chemotherapy gained significance. The objective of chemotherapy is to inhibit cell proliferation and prevent tumor growth, thereby avoiding invasion and metastasis. However, this approach also leads to toxic effects on normal cells.

Tumor growth can be hindered at various levels within the cell and its environment. Conventional chemotherapy agents primarily affect either the synthesis of macromolecules or the functioning of neoplastic cells by interfering with DNA, RNA, or protein synthesis, or by disrupting the proper functioning of preformed molecules. When obstacles in macromolecular synthesis or function are sufficient, it results in cell death either through the direct effect of the chemotherapeutic agents or by triggering apoptosis.

With conventional agents, cell death may be delayed as a proportion of the cells die due to a given treatment. Therefore, repeated administration of the medication may be necessary to achieve a response. The toxicity of cytotoxic drugs is highest during the S phase of the cell cycle, as this is when DNA synthesis occurs.[3]

Side effect-Chemotherapy not only targets cancer cells but also affects healthy cells, leading to potential side effects. The severity and occurrence of these side effects vary depending on the dosage and type of chemotherapy administered, as well as individual reactions. Common side effects may include fatigue, pain, nausea and vomiting, mouth sores, and hair loss.[4]

Immunotherapy

Immunotherapy, a form of cancer treatment, aids in bolstering the body's immune system to combat cancer. The immune system plays a crucial role in defending against infections

and various ailments, comprising white blood cells, as well as organs and tissues within the lymph system.

The field of immune-oncology has had a transformative impact on the care of cancer patients. William B. Coley, widely recognized as a pioneer of immunotherapy, was the first to explore the potential of the immune system in cancer treatment during the late nineteenth century. From 1891 onwards, Coley administered a combination of live and inactivated microorganisms, such as streptococcus pyogenic and Serratiamarcescens, to over a thousand patients. His aim was to induce sepsis and observe immune and anti-tumor responses. This mixture of bacteria, known as "Coley's toxin," is considered the earliest documented active cancer immunotherapy intervention. Coley achieved long-lasting remissions in various types of malignancies, including sarcoma, lymphoma, and testicular sarcoma.[5]

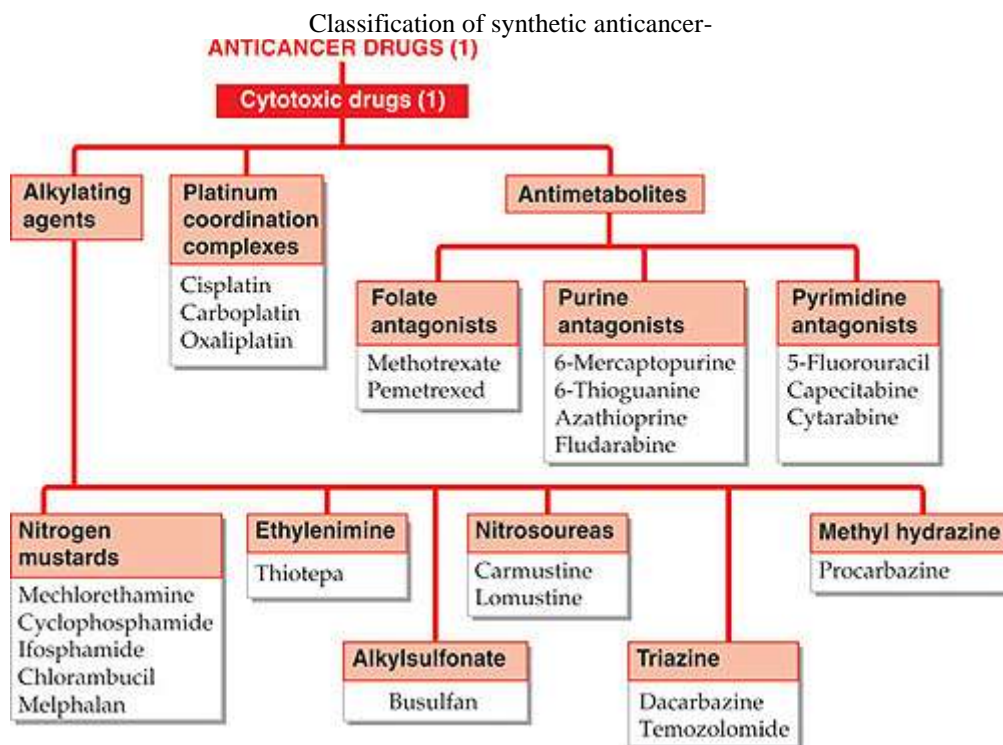


Chart No -3

Skin cancer-Skin cancer occurs due to alterations in the growth of skin cells, which can be caused by exposure to ultraviolet light. Indications of skin cancer may include the appearance of new bumps or patches on the skin, or changes in the size,

shape, or color of existing skin growths. Early detection of skin cancer is crucial, as it can be effectively treated through various methods such as Mohs surgery, cryotherapy, chemotherapy, and radiation.

Skin cancer is a medical condition characterized by the proliferation of atypical cells within the skin tissues. Under normal circumstances, the natural cycle of skin cell renewal involves the shedding of old cells and the generation of new ones. However, when this cycle is disrupted, such as by prolonged exposure to ultraviolet (UV) radiation emitted by the sun, the rate of cell growth accelerates. Consequently, these cells can either be benign, lacking the ability to metastasize or inflict harm, or malignant, posing a risk of cancer development.

Types of skin cancer

There are three main types of skin cancer:

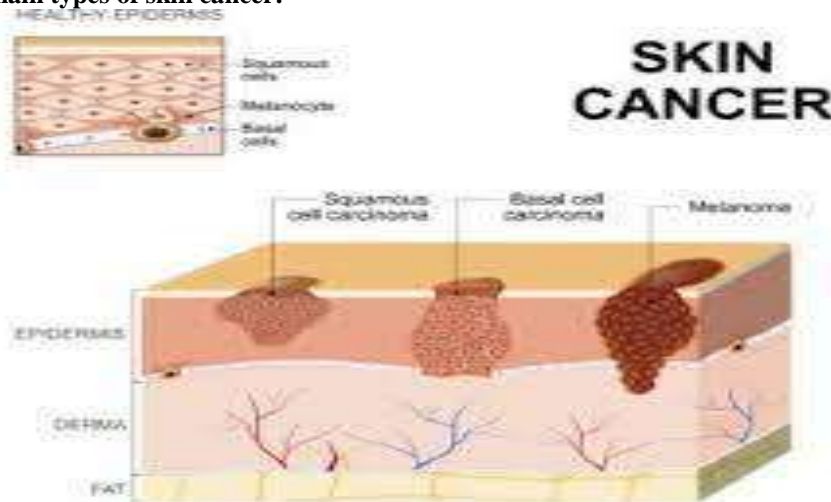


Fig No -3

Causes –

1. Exposure to ultraviolet (UV) light.
2. Spend a lot of time working or playing in the sun.
3. Family history of skin cancer
4. Red hair/fair or freckled skin
5. Weakened Immune system
6. Environmental chemicals
7. Skin injuries
8. Tan or use of tanning beds
9. History of sunburns

Symptoms –

1. Areas on our skin that look like scars
2. Patches on your skin
3. Changes the size, colour of skin growths
4. Bleeding/scabbing sore that heals and returns
5. Itching
6. Dark red /brownish skin
7. Painful lesions

- **Basal cell carcinoma**, which forms in your basal cells in the lower part of your epidermis (the outside layer of your skin).
- **Squamous cell carcinoma**, which forms in your squamous cells in the outside layer of your skin.
- **Melanoma**, which forms in cells called melanocytes. Melanocytes produce melanin, a brown pigment that gives your skin its color and protects against some of the sun's damaging UV rays. This is the most serious type of skin cancer because it can spread to other areas of your body

Risk factors-

Skin cancer can affect anyone, regardless of their race or gender. However, certain groups are more susceptible to it than others. Women and individuals assigned female at birth are more likely to develop skin cancer before the age of 50, while men and individuals assigned male at birth are more prone to it after 50. Additionally, non-Hispanic white people are about 30 times more likely to develop skin cancer than non-Hispanic Black people or those of Asian/Pacific Islander descent. Unfortunately, people with darker skin tones are often diagnosed with skin cancer at later stages, making it harder to treat.

To reduce your risk of developing skin cancer, it's important to take precautions such as limiting your time in the sun, avoiding tanning beds, and wearing protective clothing. You may be at increased risk if you have light-colored eyes, fair skin, many moles, a family history of skin cancer,

or have had an organ transplant. Additionally, certain medications and UV light therapy for skin conditions can weaken your immune system and increase your risk of developing skin cancer.

Treatment-

Synthetic drugs used in the treatment of skin cancer

- 1-Pembralizumab
- 2-Nivolumab
- 3-Surgery

Herbal drugs used in the treatment of skin cancer

- 1-Ginger
- 2-Milk Thistle
- 3-Aloe vera
- 4-Sunflower seed
- 5-Sesame
- 6-Tulsi
- 7- Turmeric
- 8-Neem

1. Ginger-



Fig No-4

- **Synonym**– Alpinapurpurata
- **Biological Source** –Ginger consists of the dried rhizomes of the Zingiberofficinale Roscoe.
- **Family** –Zingiberaceae.
- **Geographical Source**-Regions in southwest and Northeast India are most suitable for ginger production due to their warm and humid climate, average rainfall and land space.
- **Chemical constituent**-Ginger is abundant in active constituents, such as phenolic and

terpene compounds . The phenolic compounds in ginger are mainly gingerols, shogaols, and paradols. In fresh ginger, gingerols are the major polyphenols, such as 6-gingerol, 8-gingerol, and 10-gingerol.

- **Uses**:-1-Reduce the blood sugar.
- 2-Reduce the risk of cancer.
- 3-reduce the risk of Alzheimer.
- 4-Reduce blood cholesterol level .

2. Milk Thistle



Fig No-5

- **Synonym**– Marian thistle, Mary thistle
- **Biological Source** –Milk thistle is an herbal remedy derived from the milk thistle plant, also known as Silybummarianum. This prickly plant has distinctive purple flowers and white veins, which traditional stories say were caused by a drop of the Virgin Mary's milk falling onto its leaves.
- **Family** –Asteraceae/Compositae.
- **Geographical Source**-The plant, originally grown in Southern Europe and Asia, is now found throughout the world.
- **Chemical constituent** -The active constituents present in the seeds of the milk thistle are apigenin, silybonol, proteins, betaine, fixed oil, and free fatty acids.
- **Uses**:- 1_Milk Thistle Protects Your Liver.
- 2_It May Help Prevent Age-Related Decline in Brain Function.
- 3_Milk Thistle Could Protect Your Bones.
- 4_It May Improve Cancer Treatment.
- 5_It Can Boost Breast Milk Production.
- 6_Milk Thistle Can Lower Blood Sugar Levels for People With Diabetes.

- **MOA:** -Active ingredient is silymarin. Suggested to be an antioxidant, has anti-inflammatory effects, inhibits lipid peroxidation, enhance liver detoxification (enhanced glucuronidation and protection of glutathione depletion), increase hepatocytes protein synthesis (therefore promoting hepatic tissue regeneration).

3. Aloe vera



Fig No-5

- **Synonym:**– Aloe indicaRoyle, Aloe perfoliata L.
- **Biological Source:** –Aloes is obtained from the dried leaves of Aloe Vera, Aloe.
- **Family:** –Asphodelaceae (Liliaceae).
- **Geographical Source:-**
- **Chemical constituent:** -Barbaloin, Aloe Emodin, vitamin A, vitamin E, Anthraquinone.
- **Uses:-**To reduce redness, irritation and dryness.[6]
- **MOA:** -aloe vera (vitamin E) Suppressed bacterial-induced pro-inflammatory (tumor necrosis factor alpha (TNF-alpha) and Interleukin 1 beta (IL-1beta) cytokines production in human immune cells.

4- Turmeric



Fig NO-6

- **Synonyms-**Haldi, Curcuma, Indian Safron, Haridra.
- **Biological source-** Turmeric consists of dried as well as fresh rhizomes of plant curcuma longa.
- **Family-** Zingiberaceae.
- **Chemical constituents-** Curcuma, curcuminoids, cymene, Tumeron, Isdemethoxy-curcumin, demethoxy-curcumin, Diarylheptanoids.
- **Geographical source-** Tropical south Asia, Andhra Pradesh, Tamil Nadu, Orissa, Karnataka.
- **Uses-** It acts as antioxidant, also used as anti-inflammatory properties, it may have cancer fighting-effect and including against eye cancer.Also act as antibiotic eye drops.

REFERENCE

- [1]. A text book of skin cancer and UV radiation By P.Altmeyer, K.Hoffmann , M.stuker(20-27).
- [2]. A text book of pharmacology III. By Dr.Madan Kaushik, (PV publication) (109).
- [3]. Cancer chemotherapy Muhammad T. Amjad; AnushaChidharla; Anupkasi.[STATPEARLS]
- [4]. Editorial: Adverse Effect of cancer chemotherapy: Anything new to improve tolerance and reduce sequelae? KulmiraNurgali, 1,2R. Thomas jagoe,3 and Raguel Abalo,4,5,6,7* [Pub-med].
- [5]. A review of cancer immunotherapy from the past, to the present to the future. K.Esfahani, Md MSC*, L. Roudaia MD, N. Buhlaiga, MDS.V. Del Rincon, PhD +, N. Papneja, MD PHD [Pubmed].
- [6]. Textbook of pharmacognosy by C. K. KOKATE, A.P. Purohit, S. B. GOKHALE (page no. 15.32, 15.57&15.11,8.5&8.6,14.13&14.39,9.4&2 0.9,14.132) (NiraliPrakashan).