Cancer: Prevention and it Medication

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ABSTRACT

Cancer start from the body which is made up of uncontrol growth of cell generally , human cells grow and divide to form new cells in the body. This article discusses the types of cancer, pathophysiology, prevention from the disease.

Keywords: Cancer, tumors, Review.

Introduction

When cancer made, however, this old process breaks down. As cells become more and more abnormal, old or damaged cells survive when they should be die, and new cells form when they are not need. The extra cells are divide without stopping and may form growths called tumors. The cancers form solid tumors, which are the masses of tissue. Cancers of blood, such a leukemias,simply do not form solid tumors. Cancerous tumors are of malignant, which means they are spread into, or tissues. In addition, the tumors grow, some cancer cells can break off and travel to distant places in the body through the blood or the lymph system and form new tumors far from the original tumor. Unlike malignant tumors, start tumors are not spread into, or invade, near tissues. Benign tumors are sometimes quite large,. When remo, they usually do not grow back, whereas malignant tumor to sometimes. Unlike most benign tumors elsewhere in body,the benign brain tumors can are life threatening.

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Types of Cancer

Several type of cancer,. Types of cancer are named for the organs or tissues the cancers form. For example, lung cancer starts in cells of the lung, and brain cancer from in cells the brain. Cancers may also described by the of cell that formed them, such as epithelial cell or squamous cell [1,2],

Some type of cancer start from the cell tissue

Carcinoma

This is a most common type of cancer. They are made from epithelial cells, which are the cells they cover the inside and outside the body of surface There are different types of epithelial cells, which have a column-like shape when is viewed under a microscope. [3]

Carcinomas is start from the epithelial cell type of specific names:

Adenocarcinoma is a cancer that formed in epithelial cells that produce from the fluids or mucus. Tissues ,the type of epithelial cell are sometimes called as glandular tissues. Most cancers the breast, colon, and adenocarcinomas. Basal cell arecarcinoma is cancer that start in the lower or basal layer of epidermis, which a person's outer layer skin. Squamous cell carcinoma is a cancer that forms in squamous cells,

which is of epithelial cells that lie just beneath of the outer surface the skin. Squamous cell are line many of other organs, including in the stomach, intestines, lungs, bladder, and kidneys. Squamous cells looks flat, like fish scales, when viewed is under a microscope. Squamous cell carcinomas are sometimes called epidermoid carcinomas. Transitional cell carcinoma is of cancer are formed in a type of epithelial tissue called as transitional epithelium, The tissue, which is made up from many layers of epithelial cells that can bigger and smaller, is found in linings bladder, ureters, and part of kidneys , and a few other organs. Some cancers of the bladder, ureters, and kidneys are transitional of cell carcinomas [4]

1. **Sarcoma**
   Soft tissue sarcoma formed in soft tissues body, which including the muscle, tendons, blood vessels, lymph vessels, nerves tissue and around joints. Sarcomas are cancers that formed in bone and in the soft tissues, include muscles, fat, blood vessels, lymph vessels, and fibrous tissue (such as tendons and ligaments). Osteosarcom are the most common type of cancer of bone. The most common types are soft tissue sarcoma are leiomyosarcoma, Kaposi sarcoma, malignant fibrous histiocytoma, liposarcoma, and dermatofibrosarcoma protuberans. the page of soft tissue sarcoma has more information [5]

2. **Leukemia**
   Cancers are formed on blood-formed in tissue the bone marrow are called leukemias. They cancers do not formed solid tumors large numbers of abnormal white blood cells leukemia cells and leukemic blast cells build up in the blood and the bone marrow, crowding out of the normal blood cells. The low level of the blood cells are make it hard for the body to get oxygen to its tissues, control bleeding, or fight infections. There are different common types of leukemia, which are based on how quickly the disease gets worse (acute or chronic) and on the type of the blood cell the cancer starts in (lymphoblastic or myeloid) [6]

3. **Lymphoma**

   Lymphoma is cancer that start in lymphocytes , T cells or B cells. There are disease-fighting white blood cells that, they are part of the immune system. In the lymphoma, abnormal lymphocytes cell are build up ‘’lymph nodes and lymph vessels’’ as well as in organs of the body [7]

Main type of lymphoma

Hodgkin lymphoma – Person with this of disease are abnormal lymphocytes that are called Reed-Sternberg cells. The cells usually form from B cells.

Non-Hodgkin lymphoma – This is a higher of group of cancers and that start the lymphocytes. The cancers grow quickly or slowly and form they from B cells or T cells [8]

4. **Multiple Myeloma**
   Multiple myeloma is cancer that start from in plasma cells, other type of immune cell .are The abnormal plasma cells, called myeloma cells, build in the bone marrow and are form tumors in bones all through in the body. Multiple myeloma is called as plasma cell myeloma and Kahler disease [9]

5. **Melanoma**
   Melanoma is cancer that start from the cells that become melanocytes, which is the are specialized cells that melanin the pigment and gives skin its color Most melanomas form on the skin, but melanomas can also form in other pigmented tissues, such in the eye [10]

Tumospinal

Spinal and brain cell, There are different types of brain and spinal cord tumors. These tumors are named based on the type cell in. which they formed and where the tumor first formed in central nervous system. For example, astrocytic tumor begins in star-shaped brain cells called astrocytes, which help in the nerve cells healthy. Brain tumors can be start (not cancer) or malignant (cancer). The page on brain and spinal cord tumors in adults are more information, as does my overview of brain and the spinal cord tumors in children [11]

Different of Types of Tumors

1. **Germ Cell Tumors**
   Germ cell tumors are a type of the tumor that start from the cells that give rise a sperm or eggs. These tumors can occur almost in anywhere in the body and can either benign or malignant.

2. **Neuroendocrine Tumors**

Neuroendocrine tumors form from the cells, release from hormones into the blood in response to a signal from the nervous system of the cell. The tumors, which are make from higher-the normal amounts of hormones, can cause many of different symptoms are . Neuroendocrine tumors may be.

3. **Carcinoid Tumor start** or malignant
Carcinoid tumors are a type of the neuroendocrine where are slow-growing in the tumors t hey are usually found in gastrointestinal system (most often in the rectum or and small intestine). Carcinoid tumors may spread to in liver or other sites in body, and they may secrete substances such as serotonin or prostaglandins, causing carcinoid syndrome [12]

Differences between Cancer Cells and the Normal Cells

Cancer cells different from normal cells in the many ways that are allow them to grow out of control and become invasive. difference type of cancer cells are less specialized than normal cells. That is, whereas normal cells mature into very distinct cell types with of specific functions, cancer cells do not. This is one the reason that, unlike normal cells, cancer cells continue to divide without the stopping. In addition, cancer cells are able to the ignore signals that normally tell cells to stop and dividing or that start a process known as programmed cell death, or apoptosis, which are body uses to get rid of unneeded cells. Cancer cells may be able to influ normal cells, molecules, and the blood vessels that surround and feed a tumor—an area known as the microenvironment. For instance, cancer cells can induce nearby normal cells to form blood vessels that are supply the tumors with oxygen and nutrients, which they need and to grow. These blood vessels also removethe waste products from tumors. Cancer cells are also often able to evade the immune system, a network of organs, tissues, and specialized cells that protects the body from infections and other conditions. Although the immune system normally removes damaged and the abnormal cells from a body, some cancer cells are able to the "hide" from the immune system. Tumors can also be use the immune system to stay alive and grow. For example, with the help of certain immune system cells that normally prevent a runaway immune response, cancer cells can actually they keep the immune system from killing cancer cells [13]

Classification

Table 1: Classification of Anti Cancer drugs

Anti-Metabolites	• 5-fluorouracil • Gemcitabine
Anti-Biotic	• Doxorubicin • Dactinomycin
Alkylating Agent	• Busulfan • Carmustine
Microtubule Inhibitors	• Vincristin • Vinblastine
Steroid Hormones	• Estrogens • Fultamide
Monoclonal Antibodies	• Rituximav • Cetuximab
Others	• Asparaginase • Cispatin

Pathophysiology

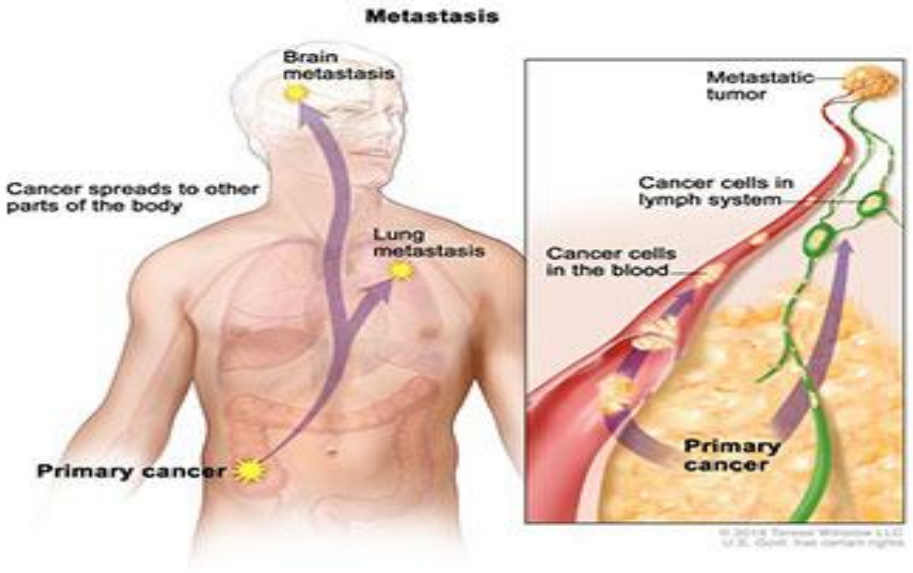

Fig.1: In the metastasis, cancer cells are break away from the where they first formed

In metastasis, cancer cells break away from the where they are first formed (primary cancer), travel through a blood or lymph system, and form a new tumors (metastatic tumors) in other parts of the body. The metastatic tumor and are the same type of the cancer as the primary tumor.

A cancer that has spread from the place of where it is first started to another place on the body is called metastatic cancer. The process by which the cancer cells spread to the other parts of the body is called as metastasis.

Metastatic cancer has same name and the same of type of cancer cells as the original, or primary, cancer. For example the, breast cancer that spreads to and formed a metastatic tumor in the lung is metastatic breast cancer, not lung cancer.

Under the microscope, metastatis cancer cells generally look the same as cells of the original cancer. However, metastatic cancer cells and the cells of original cancer usually have a some molecular features in the common, such as the presence of the specific chromosome changes. Treatment may help in prolong the lives of some the people with metastatic cancer. In general, though, the primary goal of treatments for metastatic cancer is to control the growth of the cancer or to relieve symptoms caused by it. Metastatic tumors can cause severe damage to how the body functions, and most people who die of cancer die of metastatic disease [14]

Role,s of NCI, in Cancer Biology Research

NCI supports and directs research on to the biological differences between normal cells and the cancer cells through a variety of programs and approaches. For example, the Division of Cancer Biology (DCB) supports the extramural researchers who are using to the variety of methods to study on cancer biology.

In addition to the topics mentioned above, DCB supports research on:

- the metabolism of the cancer cells, the cancer cells to the stress, and mechanisms involved in controling of the cell cycle
- biological (such as the viruses and bacteria), host factors (are such as obesity, and co-morbid conditions, and age), and the behaviors that may a cause or contribute to the development of cancer
- immune regulation and the development and the spread the tumors and approaches to improve

immune targeting and destruction of the cancer cells
- genomic instability and related the molecular, cytogenetic, and chromosomal effects during induction and progression to the malignancy
- the role of the microenvironment created by inflammation and the inflammatory a signaling molecules in the formation and progression the of tumors
- processes and molecular targets where there is potential for therapeutic or preventive intervention
- the effects of the hypoxia on tumor cell invasion and the metastasis
- the role of the somatic stem cells in the determining of tumor progression and the metastatic behavior, and control of the stem cell niche through the tumor microenvironment

NCI-supported research on programs in cancer biology include they are;:

- **Physican Sciences in Oncology Network (PS-ON)**

The goal of the initiative is to the promote and foster the convergence of physical science and cancer on research. Small transdisciplinary teams of the physical scientists (engineers, physicists, mathematicians, chemists, and computer scientists) and the cancer researchers (cancer biologists, oncologists, and pathologists) collaborate on solving the problems such as determining which cell is the cell of origin for brain and the hematopoietic tumors and exploring the use of three-dimensional images on single cells as cancer signatures.

- **Cancer Biology Consortium (CSBC)**

The CSBC focuses on combining the advanced of experimental approaches with a mathematical and computational methodologies to the build up and test of predictive models cancer. The initially takes the integrative approach to the cancer research on complement and expand our the current understanding of tumor development and progression across many physical and time scales, with ultimate to the goal of improving lives of the cancer patients.

- **Barrett's Esophagus Translational Research Network (BETRNet)**

This multidisciplinary, multi-institutional collaboration was established to better understand Barrett esophagus and to prevent esophageal adenocarcinoma. BETRNet aims to better understand esophageal adenocarcinoma (EA) biology; examine research opportunities associated with its precursor lesion, Barrett Esophagus; improve EA risk stratification and prediction; and provide strategies for EA prevention. The overriding goal is to decrease the incidence, morbidity, and mortality of this cancer [15]

- **Alliance of Glycobiologists for Detection of Cancer**

This consortium of tumor glycomics laboratories and their research partners study the cancer-related dynamics of complex carbohydrates. This program, which NCI sponsors with the National Institute of General Medical Sciences and the National Heart, Lung and Blood Institute, aims to study the structure and function of glycans in relation to cancer.

- **Molecular and Cellular Characterization of Screen-Detected Lesions Initiative**

The goal of this program is to undertake a comprehensive molecular and cellular characterization of tumor tissue, cell, and microenvironment components to distinguish screen-detected early lesions from interval and symptom-detected cancers. Researchers use various technologies and approaches to determine both the cellular and molecular phenotypes of early lesions, with the goal of better predicting the fate of early lesions.

- **Clinical Proteomic Tumor Analysis Consortium (CPTAC)**

CPTAC was launched by NCI's Office of Cancer Clinical Proteomics Research (OCCPR) to systematically identify proteins that result from genetic alterations in cancer cells, study how they affect biological processes, and provide this data with accompanying assays and protocols to the public.

- Applied Proteogenomics OrganizationaL Learning and Outcomes Network (APOLLO)
  A collaboration between the Department of Defense (DoD), Department of Veterans Affairs (VA), and NCI using the latest genomic and proteomic research methods to more rapidly and accurately identify effective drugs to treat cancer based on the proteogenomic profile of a patient's tumor. Initial collaborative efforts will focus on a cohort of 8,000 patients with lung cancer and will make data broadly available to the research community. Eventually, the effort will be expanded to additional cancer types.

NCI's Centers of Excellence bring together intramural researchers from NCI's Center for Cancer Research and Division of Cancer Epidemiology and Genetics to develop new projects and initiatives in various areas of cancer biology, including:

- **Chromosome Biology**

The experts affiliated with center study the mechanisms involved chromosome function diverse research that includes mapping in the dynamic changes of the genome and transcriptome during the development of cancer and translational research for the early diagnosis of cancer.

- **Integrative Cancer Biology and Genomics**

This center's goal is of to use advanced analytic technologies that define homogenous clusters of patients, who are can then be treated with appropriate therapies. The researchers in this center build upon the immense amount of basic research data available in an effort to shorten the time between discovery and patient benefit by bringing together expertise in five areas: biomarkers and molecular targets, genomic approaches, human genomics and [16]

Prevention of cancer

Prevention is an important component in reducing cancer health disparities, including the higher incidence and mortality rates in some population groups.

NCI's Center to Reduce Cancer Health Disparities supports programs that increase access to and use of preventive measures, such as smoking cessation, in communities in which marked disparities have been documented.

Disparities are also a focus of NCI's NCORP, which supports prevention-focused clinical studies at the community level. Currently, 12 of NCORP's 34 sites are Minority/Underserved Community Sites, with patient populations comprised of at least 30 percent racial/ethnic minorities or rural residents. (For more information, see the page on Cancer Health Disparities [17].

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