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Environmental Causes of Cancer

Dr. Aliakbar Muhamdi Ameri
Assist Professor , College of Pharmacy , Alatham Imam ., Tehran.

Abstract
This work explained most causes of tumor , cancer in cells (environmental , radiation , chem-radiation , other like food , pollution in air , water and food) .Cancer is the second-leading cause of death in the world. But survival rates are improving for many types of cancer, thanks to improvements in cancer screening and cancer treatment.

Keywords: food , water .

Introduction
Cancer refers to any one of a large number of diseases characterized by the development of abnormal cells that divide uncontrollably and have the ability to infiltrate and destroy normal body tissue. Cancer often has the ability to spread throughout your body.

Cancer is caused by changes (mutations) to the DNA within cells. The DNA inside a cell is packaged into a large number of individual genes, each of which contains a set of instructions telling the cell what functions to perform, as well as how to grow and divide. Errors in the instructions can cause the cell to stop its normal function and may allow a cell to become cancerous.

Cancer and its treatment can cause several complications, including:

- **Pain.** Pain can be caused by cancer or by cancer treatment, though not all cancer is painful. Medications and other approaches can effectively treat cancer-related pain.
- **Fatigue.** Fatigue in people with cancer has many causes, but it can often be managed. Fatigue associated with chemotherapy or radiation therapy treatments is common, but it's usually temporary.
- **Difficulty breathing.** Cancer or cancer treatment may cause a feeling of being short of breath. Treatments may bring relief.
- **Nausea.** Certain cancers and cancer treatments can cause nausea. Your doctor can sometimes predict if your treatment is likely to cause nausea. Medications and other treatments may help you prevent or decrease nausea.
- **Diarrhea or constipation.** Cancer and cancer treatment can affect your bowels and cause diarrhea or constipation.
- **Weight loss.** Cancer and cancer treatment may cause weight loss. Cancer steals food from normal cells and deprives them of nutrients. This is often not affected by how many calories or what kind of food is eaten; it's difficult to treat. In most cases, using artificial nutrition through tubes into the stomach or vein does not help change the weight loss.
- **Chemical changes in your body.** Cancer can upset the normal chemical balance in your body and increase your risk of serious complications. Signs and symptoms of chemical imbalances might include excessive thirst, frequent urination, constipation and confusion.
- **Brain and nervous system problems.** Cancer can press on nearby nerves and cause pain and loss of function of one part of your body. Cancer that involves the brain can cause headaches and stroke-like signs and symptoms, such as weakness on one side of your body.
- **Unusual immune system reactions to cancer.** In some cases the body's immune system may react to the presence of cancer by attacking healthy cells. Called paraneoplastic syndrome, these very rare reactions can lead to a variety of signs and symptoms, such as difficulty walking and seizures.
- **Cancer that spreads.** As cancer advances, it may spread (metastasize) to other parts of the body. Where cancer spreads depends on the type of cancer.
- **Cancer that returns.** Cancer survivors have a risk of cancer recurrence. Some cancers are more likely to recur than others. Ask your doctor about what you can do to reduce your risk of cancer recurrence. Your doctor may devise a follow-up care plan for you after treatment. This plan may include periodic scans and exams in the months and years after your treatment, to look for cancer recurrence.

Prevention

There's no certain way to prevent cancer. But doctors have identified several ways of reducing your cancer risk, such as:

- **Stop smoking.** If you smoke, quit. If you don't smoke, don't start. Smoking is linked to several types of cancer — not just lung cancer. Stopping now will reduce your risk of cancer in the future.
- **Avoid excessive sun exposure.** Harmful ultraviolet (UV) rays from the sun can increase your risk of skin cancer. Limit your sun exposure by staying in the shade, wearing protective clothing or applying sunscreen.
- **Eat a healthy diet.** Choose a diet rich in fruits and vegetables. Select whole grains and lean proteins.
- **Exercise most days of the week.** Regular exercise is linked to a lower risk of cancer. Aim for at least 30 minutes of exercise most days of the week. If you haven't been exercising regularly, start out slowly and work your way up to 30 minutes or longer.
- **Maintain a healthy weight.** Being overweight or obese may increase your risk of cancer. Work to achieve and maintain a healthy weight through a combination of a healthy diet and regular exercise.
- **Drink alcohol in moderation, if you choose to drink.** If you choose to drink alcohol, limit yourself to one drink a day if you're a woman of any age or a man older than age 65, or two drinks a day if you're a man 65 years old or younger.

Many studies of cancer risk factors rely on observational approaches. In these studies, researchers keep track of a group of people for several years without trying to change their lives or provide special treatment

The substances that cause cancer are called carcinogens. A carcinogen may be a chemical substance, such as certain molecules in tobacco smoke. The cause of cancer may be environmental agents, viral or genetic factors.

We should bear in mind, though, that in the majority of cancer cases we cannot attribute the disease to a single cause.

Cancer causing factors related to work and living environments include:

- asbestos fibres
- tar and pitch
- polynuclear hydrocarbons (e.g. benzopyrene)
- Some metal compounds
- Some plastic chemicals (e.g. Vinyl chloride)

Bacteria and viruses can cause cancer:

- Helicobacter pylori (H. pylori, which causes gastritis)
- HBV, HCV (hepatitis viruses that cause hepatitis)
- HPV (human papilloma virus, papilloma virus, which causes changes eg. Cervical cells)
- EBV (Epstein-Barr virus, the herpes virus that causes inflammation of the throat lymphoid)

Radiation can cause cancer:

- ionising radiation (e.g. X-ray radiation, soil radon)
- non-ionised radiation (the sun's ultraviolet radiation)

Some drugs may increase the risk of cancer:

- certain antineoplastic agents
- certain hormones
- medicines that cause immune deficiency

In 5 – 10 per cent of breast cancer genetic predisposition plays an important role in the emergence of the disease.

There is no one single cause for cancer. Scientists believe that it is the interaction of many factors together that produces cancer. The factors involved may be genetic, environmental, or constitutional characteristics of the individual.

Diagnosis, treatment, and prognosis for childhood cancers are different than for adult cancers. The main differences are the survival rate and the cause of the cancer. The overall five-year survival rate for childhood cancer is about 80%, while in adult cancers the survival rate is 68%. This difference is thought to be because childhood cancer is more responsive to therapy and a child can tolerate more aggressive therapy.

Childhood cancers often occur or begin in the stem cells, which are simple cells capable of producing other types of specialized cells that the body needs. A sporadic (occurs by chance) cell change or mutation is usually what causes childhood cancer. In adults, the type of cell that becomes cancerous is usually an epithelial cell. Epithelial cells line the body cavity and cover the body surface. Cancer occurs from environmental exposures to these cells over time. Adult cancers are sometimes referred to as acquired for this reason.

Cancer Risk Factors

As mentioned, some cancers, particularly in adults, have been associated with repetitive exposures or risk factors. A risk factor is anything that may increase a person's chance of developing a disease. A risk factor does not necessarily cause the disease, but it may make the body less resistant to it. The following risk factors and mechanisms have been proposed as contributing to cancer:

- Lifestyle factors. Smoking, a high-fat diet, and working with toxic chemicals are examples of lifestyle choices that may be risk factors for some adult cancers. Most children with cancer, however, are too young to have been exposed to these lifestyle factors for any extended time.
- Family history, inheritance, and genetics may play an important role in some childhood cancers. It is possible for cancer of varying forms to be present more than once in a family. It is unknown in these circumstances if the disease is caused by a genetic mutation, exposure to chemicals near a family's residence, a combination of these factors, or simply coincidence.
- Some genetic disorders. For example, Wiskott-Aldrich and Beckwith-Wiedemann syndrome are known to alter the immune system. The immune system is a complex system that functions to protect our bodies from infection and disease. The bone marrow produces cells that later mature and function as part of the immune system. One theory suggests that the cells in the bone marrow, the stem cells, become damaged or defective, so when they reproduce to make more cells, they make abnormal cells or cancer cells. The cause of the defect in the stem cells could be related to an inherited genetic defect or exposure to a virus or toxin.
- Exposures to certain viruses. Epstein-Barr virus and HIV, the virus that causes AIDS, have been linked to an increased risk of developing certain childhood cancers, such as Hodgkin and non-Hodgkin lymphoma. Possibly, the virus alters a cell in some way. That cell then reproduces an altered cell and, eventually, these alterations become a cancer cell that reproduces more cancer cells.
- Environmental exposures. Pesticides, fertilizers, and power lines have been researched for a direct link to childhood cancers. There has been evidence of cancer occurring among nonrelated children in certain neighborhoods and/or cities. Whether prenatal or infant exposure to these agents causes cancer, or whether it is a coincidence, is unknown.
- Some forms of high-dose chemotherapy and radiation. In some cases, children who have been exposed to these agents may develop a second malignancy later in life. These strong anticancer agents can alter cells and/or the immune system. A second malignancy is a cancer that appears as a result from treatment of a different cancer.

Cancer Genes

How do genes affect cancer growth?

The discovery of certain types of genes that contribute to cancer has been an extremely important development for cancer research. Over 90% of cancers are observed to have some type of genetic alteration. Some of these alterations are inherited, while others are sporadic, which means they occur by chance or occur from environmental exposures (usually over many years).

Types of cancer genes

There are three main types of genes that can affect cell growth and are altered (mutated) in certain types of cancers, including the following:

- Oncogenes: These genes regulate the normal growth of cells. Scientists commonly describe oncogenes as similar to a cancer "switch" that most people have in their bodies. What "flips the switch" to make these oncogenes suddenly become unable to control the normal growth of cells and allowing abnormal cancer cells to begin to grow, is unknown.
- Tumor suppressor genes: These genes are able to recognize abnormal growth and reproduction of damaged cells, or cancer cells, and can interrupt their reproduction until the defect is corrected. If the tumor suppressor genes are mutated, however, and they do not function properly, tumor growth may occur.
- Mismatch-repair genes: These genes help recognize errors when DNA is copied to make a new cell. If the DNA does not "match" perfectly, these genes repair the mismatch and correct the error. If these genes are not working properly, however, errors in DNA can be transmitted to new cells, causing them to be damaged.

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