

CANCER – NOT BAD LUCK

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ABSTRACT

An explosion of research has been done in discovering how human health is affected by environmental factors. I will discuss the impacts of environmental cancer causing factors and how they continue to cause multiple disruptions in cellular networking. Some risk factors may not cause cancer. Other factors initiate consecutive genetic mutations that would eventually alter the normal pathway of cellular proliferations and differentiation. Genetic mutations in four groups of genes; (Oncogenes, Tumor suppressor genes, Apoptosis genes and DNA repairing genes) play a vital role in altering the normal cell division. In recent years, molecular genetics have greatly increased our understanding of the basic mechanisms in cancer development and utilizing these molecular techniques for cancer screening, diagnosis, prognosis and therapies. Inhibition of carcinogenic exposures wherever possible should be the goal of cancer prevention programs to reduce exposures from all environmental carcinogens.

Keywords: Cancer, lifestyle factors, chemicals, carcinogenic factors

INTRODUCTION

Most cancer cases are caused by lifestyle, environment, not a bad luck. one can't smoke and say its bad luck if they become a cancer patient. Risk of cancer are increasing due to exposure to carcinogens-cancer causing agents. They can be physical, biological and chemical agents. Chemical agents that cause cancer are well known and is preventable such as asbestos, tobacco smoke, drinking alcohol and deliberate sun exposure and in the wider environment through air, water or soil pollution and also through particular chemicals used in consumer products.

Contamination of food by environmental chemicals such as dioxins, poly chlorinated biphenyls and pesticide residues is of public concern. Study has been proved that food chain is the primary pathway of human exposure to chemicals. A huge range of pesticides is widely used in the production of food and potential harmful effects from pesticide. Current regulation must ensure carcinogenic free substances are reached in market. Scientists are studying which exposures may cause or contribute to the development of cancer. Understanding exposures which are harmful, and their origination, may help people to avoid them.

The International Agency for Research on Cancer (IARC) and the U.S. National Toxicology Program (NTP) group carcinogens into categories based on how likely they are to cause cancer. While most people think environmental cancer risks are strictly external toxins like air and water pollution and chemicals like radon, the IARC, NTP and others also count lifestyle factors like nutrition and tobacco use and natural exposures like ultraviolet light in the mix.

ENVIRONMENTAL RISK FACTORS

Poor air quality over cities, polluted drinking water, chemicals in food are just a few exposures in the environment that may cause cancer. Cancer causing agent-carcinogen, if allowed to accumulate in the body for extended period of time, there is a big chances to get your cells damaged, which results in the growth of cancer cells. Changes in our cells may be caused by genetics, while others may be caused by environmental factors. Environmental factors can include a wide range of exposures, such as:

Lifestyle factors:

Use of tobacco, alcohol or drugs, diet

The most significant environmental risk factor for cancer is tobacco, whether they're using products like cigarettes, pipes, cigars, chewing tobacco, snuff or vaping, or being exposed to second-hand smoke. In fact, tobacco accounts for 80 percent to 90 percent of all cases of lung cancer, which is the second most common cancer in both men and women. Smokers are more likely than nonsmokers to develop different types of cancers, such as; lung, larynx, mouth, oesophagus, bladder, kidney, throat, stomach, pancreas, cervix and acute myeloid leukemia. Smoking also contributes to cardiovascular, brain stroke, pulmonary, congenital deformities and sudden infant death syndrome. Among 4000 chemicals that have been identified in tobacco smoke, at least 400 are known to be harmful to human health.

Research has found that the more alcohol someone drinks, the higher the risk of cancer. People who consumes alcohol are more likely to develop head and neck cancer than those who don't drink. Alcohol consumption also has been linked to liver, oesophageal, colorectal and breast cancers. It increases cancer risk by damaging cell DNA and proteins, body's ability to break down nutrients, and increases estrogen levels. People who use both alcohol and tobacco have much higher risks of developing head and neck cancer than those who use alcohol or tobacco alone.

Fast food side effects are obesity, worker exploitation and negative health outcome. Most of the fast food prepared from processed ingredients which have its own benefits and risks. People who have a poor diet with less physical activity may be at increased risk of several diseases. Obese people will be at higher risk of coronary heart disease, stroke, high blood pressure, diabetes, and cancers (oesophagus, breast, uterus, colon, rectum and prostate). Obesity is linked to 13 types of cancer, including two of the most common—breast and prostate—but only a little more than half of Americans are aware that it's a risk factor for cancer. *"Obesity has become so important in the field of oncology today that maintaining an appropriate weight is one of the most important ways you can protect yourself from cancer,"* says Anthony Perre, MD, Chief of the Division of Outpatient Medicine at Cancer Treatment Centres of America® (CTCA).

Sunlight and ionizing radiation

Ultraviolet (UV) rays from the sun, sunlamps or tanning beds may damage cell DNA and lead to melanoma or other forms of skin cancer. Skin cancer is the most common form of cancer, affecting more than 3.5 million Americans each year, and melanoma accounts for the most skin cancer deaths. And its incidence is on the rise. In fact, if melanoma rates continue to increase at the same pace, 112,000 new cases of the disease will be diagnosed in 2030. Three types of sun radiations include the visible (colour), infrared (heat) and UV lights (UVA, UVB, UVC). The UV light from sun and tanning can cause skin damages, such as; benign, pigmentation, discoloration, freckles, sunburn, cancers (Basal cell carcinoma, squamous carcinoma and Melanoma) and destruction of elastin and collagen proteins. Exposure to UV sunlight produces the same skin damages in winter as well as summer time.

Radiation is energy in the form of high-speed particles or electromagnetic waves. Exposure to ultraviolet radiation and ionizing radiation can clearly cause cancer. Exposure to solar ultraviolet radiation is the major cause of non-melanoma skin cancers, which are by far the most common malignancies in human populations. Ionizing radiation can cause cell damage that leads to cancer. Ionizing radiation is thought to cause about 1 percent of all cancers. It comes from cosmic rays that enter the Earth's atmosphere, the radioactive gas radon—found naturally at low levels in soil—and from certain medical procedures, such as X-rays and radiation therapy. When cancer treatments increase your risk of developing another cancer later in life, the decision-making process often involves weighing the risks against the benefits, says Glynis Vashi, MD, Intake Physician and Chief of Medicine at our hospital near Chicago. *"It takes years for a cancer to develop," she says. "So you do what you have to do at the time, and then you take as many preventive steps as possible to improve the chance that you won't develop another cancer in the future."*

Air and water pollution

Air and water pollution is the results of biological, biochemical and atmospheric particles which cause damages to our living environment. Air pollution is a significant risk factor for respiratory infections, cardiac disease and lung cancer. The main cause of air pollution includes particulate matter, damaged ozone, nitrogen dioxide, sulfur dioxide, carbon dioxide, carbon monoxide, and ammonia, radioactive decay of radon gas, methane, hydrofluorocarbons and chlorofluorocarbons. Almost 3.5 million deaths are caused by both indoor and outdoor pollution worldwide. Water pollution is caused by several pathways; 1. Microorganism infection; bacteria,

viruses, protozoa and parasitic worms. 2. Wastes that are decomposed by oxygen-requiring bacteria by oxygen reduction leading to fish death. 3. Acids, salts and toxic metals which cause the death of aquatic life. 4. Nutrients like water-soluble nitrates and phosphates which cause excessive growth of algae by using water's oxygen leading to fish death. 5. Water polluted by several organic compounds such as; oil, plastics, detergents, chloroform, petroleum, polychlorinated biophenyl, fertilizer, sulfur oxide, pesticides and trichloroethylene which cause various human diseases including cancer.

CHEMICALS IN THE ENVIRONMENT

The most significant risks of developing cancer come from lifestyle factors. However, exposures to certain chemicals in the environment, at home, and at work may contribute to an individual's risk of developing cancer. Benzene, asbestos, vinyl chloride, radon, and arsenic are examples of toxic substances that can increase the risk of cancer to those who are exposed. The International Agency for Research on Cancer (IARC) has classified these substances as "known human carcinogens."

Asbestos

Asbestos occurs in rock and soil, and is often found in building construction materials for insulation. The mineral fiber increases the risk of lung cancer, mesothelioma, laryngeal cancer and ovarian cancer. Asbestos exposure accounts for the largest percentage of occupational cancer risks, with the highest risk among affected workers who also smoke. The Occupational Safety and Health Administration regulates asbestos levels in workplaces, but because the fiber is present in the air, water and soil, avoiding asbestos is nearly impossible. Most people who are exposed to the fiber don't develop disease, but the greater the exposure, the greater the risk.

If you are planning to remodel your home, which may disturb building materials, or if your home contains damaged materials, such as crumbling drywall or insulation, you may consider hiring someone to inspect it for asbestos-containing materials. If your home does contain asbestos, an inspector can give you recommendations for correction or prevention. And make sure to wear a mask and other protective gear while doing any of your own remodelling.

Formaldehyde

Formaldehyde also occurs naturally in the environment. It is produced during the decay of plant material in the soil and during normal chemical processes in most living organisms. It is also a combustion product found in tobacco smoke. People are exposed primarily by inhaling formaldehyde gas or vapor from the air or by absorbing liquids containing formaldehyde through the skin. Workers who produce formaldehyde or products that contain formaldehyde—as well as laboratory technicians, certain health care professionals, and mortuary employees—may be exposed to higher levels of formaldehyde than people in the general population.

Studies of workers exposed to high levels of formaldehyde, such as industrial workers and embalmers, have found that formaldehyde causes myeloid leukemia and rare cancers, including cancers of the paranasal sinuses, nasal cavity, and nasopharynx.

Secondhand Tobacco Smoke

Secondhand tobacco smoke is the combination of the smoke given off by a burning tobacco product and the smoke exhaled by a smoker. It is also called environmental tobacco smoke, involuntary smoke, and passive smoke. More than 7,000 chemicals have been identified in secondhand tobacco smoke. At least 69 of these chemicals are known to cause cancer, including arsenic, benzene, beryllium, chromium and formaldehyde.

People can be exposed to secondhand smoke in homes, cars, the workplace, and public places. In the United States, the source of most secondhand smoke is from cigarettes, followed by pipes, cigars, and other tobacco products.

Wood Dust

Wood dust is created when machines or tools are used to cut or shape wood. High amounts of wood dust are produced in sawmills, and in the furniture-making, cabinet-making, and carpentry industries. Individuals who use machinery or tools to cut or shape wood are exposed to wood dust. When the dust is inhaled, it is deposited in the nose, throat, and other airways. Occupations with high exposure to wood dust include sander operators in

the transportation equipment industry, press operators in the wood products industry, lathe operators in the furniture industry, and sander operators in the wood cabinet industry.

Strong and consistent associations with cancers of the paranasal sinuses and nasal cavity have been observed both in studies of people whose occupations were associated with wood-dust exposure and in studies that directly estimated wood-dust exposure.

Reduce- Cancer Risk

In the United States, regulations have been put in place to reduce exposures to known carcinogens in the workplace. Outside of the workplace, people can also take steps to limit their exposure to known carcinogens, such as quitting smoking, limiting sun exposure, limiting alcohol drinking, or, for those of the appropriate age, having HPV and HBV vaccination. See Risk Factors for Cancer for more information about known and suspected carcinogens. To reduce your risk of lung cancer, avoid tobacco altogether—don't start the habit, and if you have, quit as soon as possible, and steer clear of second-hand smoke.

The best way to avoid getting cancer is to adopt a healthy lifestyle and reduce exposure to harmful environment factors as much as possible. If you know you will be around chemicals, wear a mask. If you are going to be in the sun, use sunscreen. You have the power to reduce your cancer risk by living healthier. To reduce your risk, limit your exposure to UV rays—both from the sun and indoor tanning—and wear sunscreen and protective clothing when outdoors. You also should protect yourself from UV radiation which can penetrate light clothing, windshields, and windows. Wear long sleeves, long pants, a hat and sunglasses with lenses that absorb UV. Sunscreen (Sun Protection Factor) can prevent skin cancer. Stay away from sunlamps and tanning booths. They are not safer than sunlight.

To help avoid obesity-related cancers, experts recommend you lose excess weight through diet and exercise, if possible, and with the help of behavioural and dietary counselling, if necessary. Having a healthy diet, and being physically active may help to reduce cancer risks. Doctors suggest the following: A healthy diet includes plenty of foods that are high in fiber, low in fat, vitamins, minerals, whole-grain breads, cereals, fruits and vegetables every day. A good physical activity can help control your weight and reduce body fat.

Conclusion

Cancer is a complex genetic disease as a consequence of environmental exposures which serve as the driving force in initiating tumor development and progression. The scientific literatures provide substantial evidences of environmental and occupational causes of cancer. This will fully support an accelerated effort to prevent carcinogenic exposures. In addition to all of the evidences cited, there are many other indications that environmental exposures are linked to various human cancers. The single major risk factor for cancer is age, and the number of our geriatric people is rapidly increasing. If we look only at incident patterns among those aged 65 and 85 years old, there will be a significant increase number of cancer patients over the past 30 years. The same is correct for other ages as well. Cancer has become a widespread disease with epidemic proportions in certain cancer sites in a single generation. Currently, about one in four Americans could expect a cancer diagnosis at some point during his or her lifetime.

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