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Research Article

Systematization Of Environmental Risk Factors For Malignancy

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ABSTRACT

The cancer process begins with altered cell function caused by genetic and epigenetic alterations. These changes appear as chromosomal or molecular defects, causing genetic instability. It is difficult to pinpoint particular causes, but it is apparent that a combination of risk factors plays a substantial role in cancer development. Cancer onset is influenced by environmental, internal, and hereditary factors. The majority of research on malignant tumor formation has focused on identifying environmental and genetic factors that influence cancer rates. According to current research, outside environmental variables such as toxins cause 80-90% of malignant tumors. According to research, human behavior-related environmental variables such as smoking, excessive alcohol use, food, and reproductive practices play an important role in the creation of malignant tumors.

INTRODUCTION

Every year, cancer kills approximately 90,000 people and creates an additional 12,000 new cases. It is a major cause of premature death among young and middle-aged people in Poland (aged 20-64), one of the highest in the world. In addition, it is the leading cause of death among women aged 20 to 64. Women's mortality rates increased by twofold during 40 years, while men's mortality rates increased threefold. Cancer-related illness and death are mostly the result of changes in risk factor exposure. Cancer kills more people worldwide than heart disease, according to the World Health Organisation. More than 20 million

additional cancer cases are projected by 2025, with a concentration in low- and middle-income nations. Evidence of cancer can be broken into two types: accidental (due to disparities in gender, age, and socioeconomic situations) and analytical research aiming to test theories found in the first category [1, 2, 3].

Objective:

Our main goal is to organize knowledge about malignant tumor risk factors and update it with the latest research findings.

MATERIALS AND METHOD:

Let's look at the materials and procedures used for this review. We conducted a PubMed search for

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articles published between 2010 and 2018. Combining terms such as 'cancer risk factors,' 'cancer environmental variables,' and others allowed us to discover possibly related publications. After screening, we cut it down to 64 English and Polish articles. We concentrated on providing environmental risk factors for cancer to provide you with a comprehensive review of the existing literature.

RESULT:

Physical Factors:

Let's talk about electromagnetic fields now. So, in 1979, Wertheimer and Leeper conducted research and discovered that American children living in houses with high magnetic fields were at a higher risk of developing leukemia. Then, in 1998, specialists at the United States National Institute of Environmental Health Science stated that there was some evidence that magnetic field exposure could lead to cancer. According to the World Organisation, a 50/60 Hz magnetic field may cause tumors. Some studies also suggest that low-frequency magnetic fields (0-300 Hz) may raise your risk of developing breast cancer. Isn't that absurd? Women working near power lines in Sweden and technicians in New York, for example, appear to be in higher danger. Children exposed to magnetic fields stronger than $0.4 \mu\text{T}$ (4 mg) may have a doubled chance of developing leukemia, however, the risk could double - but we're not sure if the fields cause it.

Ultraviolet radiation:

Ultraviolet rays are the skin's worst nightmare. You are aware that they have the potential to cause significant damage. Excessive sun exposure can make your skin red and burned, and it can eventually age you or cause skin cancer. Isn't that frightening? UVB photons, or shortwaves, account for only 5% of all UV rays that strike the planet. The remainder is made up of UVA. UV rays harm your DNA, producing mutations and interfering with cell growth. UVB photons are extremely

stealthy and have the potential to inflict greater damage than UVA. Tanning beds can also hurt your skin. To keep your skin safe and healthy, make sure to shield yourself from dangerous UV rays.

Chemical factors:

Tobacco smoking:

Tobacco use is the most significant risk factor that can be avoided when it comes to cancer-related fatalities worldwide, accounting for nearly 6 million deaths per year. According to the WHO FCTC, any tobacco product, whether wholly or partially manufactured from tobacco leaves for smoking, chewing, or sniffing, acts as a reservoir for many carcinogens and other hazardous substances. Some of these carcinogens are naturally occurring in tobacco, such as nitrosamines (TSNA) and 4-(methyl nitrosamine)-1-(3-pyridyl)-1-butanone (NNK). Many of them form as a result of tobacco combustion. Tobacco handling, treatment, and storage may also result in the production of carcinogens such as volatile aldehydes (for example, acetaldehyde and formaldehyde) and TSNA. According to the International Agency for Research on Cancer (IARC), approximately 70 components in tobacco smoke are carcinogenic to either laboratory animals or people, with 16 of these being recognized as cancer-causing agents in humans. Benzene, dimethyl nitrosamine, ethyl methyl nitrosamine, diethyl nitrosamine, nitroso pyrrolidine, hydrazine, and vinyl chloride are notable examples of chemicals with significant potency.

Alcohol:

So, research has discovered a relationship between alcohol consumption and cancer risk. Drinking alcohol can increase the risk of developing cancer in several regions of the body, including the throat and liver. The risk level is determined by the amount of alcohol consumed as well as other factors. Even tiny doses can increase the risk. Did



you know that just one drink each day increases the risk of breast cancer by %? It's! Two beers each day increase the risk of colorectal cancer by 8%. According to the Agency for Research on Cancer, alcohol is a significant cause of liver cancer. Drinking any amount of alcohol, high or low, increases your risk of developing cancer. Women are permitted to drink one glass of wine or beer each day. Men can have twice the amount. Alcohol can exacerbate cancer by damaging the mucosal membrane or interfering with the liver's detoxification function. Be wary of how much you drink! Be safe and take care of yourself!

Other Chemicals:

Children are exposed to a variety of chemicals in their daily lives, including household goods and environmental influences. The advancement of society has resulted in the proliferation of toxic substances, which contribute to genetic mutations. Exposure to vehicular fumes, industrial pollution, and hazardous waste has been linked to an increase in childhood cancer rates. Furthermore, high quantities of pesticides, smoking, incense, hair color, and agricultural pollutants may increase cancer risk. Certain drugs, such as stilbestrol derivatives used in abortions or aromatic benzene compounds, can have carcinogenic consequences. We must be aware of these threats for our children's safety.

Biological factors:

Diet:

Did you realize that eating the wrong stuff might lead to cancer? It's true! Our modern environment is full of disgusting stuff that can cause those awful tumors. According to the 7th World Cancer Research Fund Report, approximately 35% of cancer cases worldwide are linked to what we eat and how little we walk. Isn't that scary? Some types of cancer, such as colon, breast, esophagus, stomach, and pancreatic, are more likely to develop if you consume too many calories (hello

weight gain!), fat, sugar, and insufficient fiber, calcium, or vitamins.

Infections:

In the field of cancer formation, there is an increasing emphasis on infections as key participants in the genesis of malignant diseases. Exposure to frequent infections increases as infectious agents accumulate in densely populated places and as a result of contact with animals that may harbor carcinogenic infectious pathogens. An increasing number of infectious agents that contribute to specific malignancies in humans are currently known. *Helicobacter pylori* infections have been linked to gastric cancer, *C. pneumonia* to lung cancer, and *Chlamydia trachomatis* to the development of cervical cancer. Some human viruses are carcinogenic. The Epstein-Barr virus (EBV) has been found in tumor cells associated with nasopharyngeal carcinoma and Burkitt's lymphoma. A recent study reveals that EBV plays a role in gastric cancer, Hodgkin's lymphoma, palatal tonsil, and tongue cancer. Furthermore, *Salmonella typhi* infection has the potential to cause cholangiocarcinoma. *Streptococcus bovis* is often linked to colorectal cancer. Lymphoma is linked to *Borrelia burgdorferi* spirochete infections, which cause Lyme disease. Human herpesvirus type 8 (HHV8) has an etiopathogenic relation to Kaposi's sarcoma in AIDS patients. Human papillomavirus (HPV) is a primary cause of cervical cancer and has lately been linked to tongue and tonsil cancers. Hepatitis B, C, and D viruses (HBV, HCV, HDV) increase the risk of carcinogenesis because they cause chronic infections that impair cell cycle regulation and lead to malignant alterations.

CONCLUSION:

Approximately 1.7 million Americans were diagnosed with cancer in 2015. By 2030, that figure will have risen to approximately 2.3 million. To find a balance between successful treatment and quality of life, approximately two out of every



three Americans live for at least five years after being diagnosed with cancer. Despite this progress, cancer remains the leading cause of death in the United States, with 600,000 lives lost in 2015 alone. Cancer has developed as a major public health issue around the world. Seven in ten cancer fatalities occur in Africa, Asia, and Central and South America. Estimates suggest that global cancer fatalities will increase by up to 80% by 2030. The three most prevalent forms of cancer diagnosed worldwide are lung, breast, and colorectal. The top causes of cancer-related fatalities in the world are lung cancer (1.6 million), liver cancer (0.8 million), and stomach cancer (0.7 million). According to epidemiological studies, environmental variables pose the greatest chance of developing neoplastic changes, pointing to genetic material mutations caused by carcinogens dispersed over multiple locations. Substantial evidence demonstrates that tobacco and its byproducts contribute significantly to global cancer incidence due to recognized carcinogenic components in the plant or as a result of processing and preservation methods. Furthermore, alcohol is increasingly recognized as a potent carcinogen, even in small doses, and is especially damaging when mixed with smoking due to its synergistic action, which boosts the solvent properties of hazardous chemicals found in tobacco smoke dissolved in ethanol. Scientific studies have shown that diet can play an important role in affecting the risk of acquiring cancer, emphasizing the link between body weight, diet composition, and cancer susceptibility. Inadequate intake of fruits and vegetables, folic acid insufficiency, excessive consumption of red meat or processed foods, and low dietary fiber intake have all been linked to an increased risk of cancer. Chemical compounds generated during food processing, such as nitrosamines, polycyclic aromatic hydrocarbons, and acrylamide, have carcinogenic qualities,

adding to the complexity of understanding how lifestyle choices affect general health.

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together towards healthier outcomes!
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