

Does a Healthy and Regular Diet Prevent Cancer? Amazing Medical Benefits of Red Beet (*Beta Vulgaris*) as an Antioxidant

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ABSTRACT

In recent years, both dietary and cancer treatment approaches that target deregulated tumor metabolism are beginning to be considered for preclinic and clinical applications. Nutrition regimen is also extremely important in determining cancer treatment strategies. This review also suggests that nutrition can affect and potentially enhance the immune response against cancer. In this review, I try to illustrate how dietary therapies differ in their effect on metabolism. It is important to provide preventive medicine and patient-specific diet in order to control tumor development and prevent the spread of cancer. Microbiota-regulating diets, have been demonstrated to lower the risk of developing some cancers and reduce the mortality associated with them. Finally, supplements, such as omega-3 and antioxidant, are discussed as potential approaches that could benefit healthy dietary and lifestyle habits to protect the immune system against cancer and especially against chemotherapeutic agents.

KEYWORDS: Red beet; Complementary medicine; Herbal drug; Cancer; Diet; Metabolomics

INTRODUCTION

You may have heard the terms alternative and complementary medicine both in the diagnosis of cancer and in the prevention and treatment of cancer. But do you know how safe these methods are?

Cancer is a large group of diseases that can start in almost any organ or tissue of the body when abnormal cells grow uncontrollably, go beyond their usual boundaries to invade adjoining parts of the body and/or spread to other organs. The latter process is called metastasizing and is a major cause of death from cancer. A neoplasm and malignant tumour are other common names for cancer. Lung, prostate, colorectal, stomach and liver cancer are the most common types of cancer in men,

while breast, colorectal, lung, cervical and thyroid cancers are the most common among women [1].

Biological therapeutics, also called biologics, constitute a class of drugs that are grown and then purified from large-scale bacterial or yeast cell cultures or plant and animal cells. Biological therapeutics is also a diverse group of biological drugs that include vaccines, growth factors, immune modulators, monoclonal antibodies, and products derived from human blood [2]. What distinguishes biologics from other medicines is that these are generally proteins purified from living culture systems or from blood, whereas other medicines are considered as "small molecules" and are either made synthetically or purified from plants. Though there are no miracle superfoods that can prevent cancer, some evidence suggests that dietary habits can offer protection. The incidence of cancer can be reduced by 30-40% with proper and healthy nutrition, physical activity and weight control. Nutrition; It is a behaviour that should be done consciously in order to take the nutrients needed by the body in sufficient quantities and at appropriate times in order to protect, improve health and the quality of life. When any of these items are not taken, when taken more or less than necessary, growth and development are prevented and health deteriorates. This situation is called Unbalanced Nutrition [3,4]. In the prevention of unbalanced nutrition, it is of great importance to gain awareness of healthy nutrition through nutritional education. A healthy diet is an adequate and balanced diet. For the regular and balanced functioning of the cells that make up our body, we must take sufficient amounts of nutrients, namely fats, carbohydrates, proteins, vitamins and minerals. Our body needs all the nutrients. It is wrong to eat unilaterally, that is, to feed only with protein or carbohydrates. By eating a balanced diet, we also get important nutrients such as vitamins, minerals and fiber. In briefly, no single food can protect against cancer. However, eating a diet full of diverse whole foods, such as fruit, vegetables, whole grains, legumes, spices, healthy fats, fresh fish and high-quality diet, may reduce cancer risk [5-7]. A diet high in whole foods like fruits, vegetables, whole grains, healthy fats and lean meat may prevent cancer. Though no diet has been proven to cure cancer, plant-based and keto diets may lower your risk or benefit treatment. Generally, people with cancer are encouraged to follow a healthy, balanced diet to preserve quality of life and support optimal health outcomes. Biotechnology describes biological processes that have been manipulated or modified in some way through modern science. A major industrial application of biotechnology is in the development and preparation of

biological medicinal products using genetically engineered bacteria, yeast, fungi, cells or even whole animals and plants. The World Health Organization brings together international experts through its biological standardization programme to develop and revise guidance on biotherapeutic products [8,9].

Beets or beetroots, as they are often called, belong to the *Chenopodiaceae* family. Beetroots are one of the varieties of the *Beta vulgaris* species. Their history stretches back to ancient times, and the earliest signs of their cultivation were approximately 4,000 years ago in the Mediterranean region [10]. It was then mainly used for medicinal purposes until the 1800s when French chefs realized their potential as a side dish. It is said that beets can help with liver disease and lower blood pressure when used in combination with some medicines. Apart from its use as a food, it is used as a medicinal plant and also for food coloring [11]. Macular degeneration is often associated with an increase in free radicals, which greatly affects the premature aging process of many people. Beta-carotene is a powerful form of vitamin A that has antioxidant properties and protects the eyes against the harmful effects of free radicals [12]. Beetroot is extremely beneficial for health due to its nutritional content, which includes vitamins, minerals, carotenoids, glycine, betaine, magnesium, iron, copper, and organic compounds such as phosphorus. As it is a source of beneficial flavonoids called anthocyanins; It is effective in the treatment of anemia, indigestion, constipation, hemorrhoids, kidney and gall bladder disorders, cancer and heart diseases [13]. Beets are a unique source of phytonutrients called betalains. Betanin and vulgaxanthin are the two best-studied betalains from beets, and both have been shown to provide antioxidant, anti-inflammatory, and detoxification support [14]. For example, one recent study has shown the red betalain pigments in beets to be far less heat stable than red anthocyanin pigments in red cabbage. The difference between 15 minutes of steaming versus 25 minutes of steaming, or 60 minutes of roasting versus 90 minutes of roasting can be significant in terms of betalain damage [15,16]. For these reasons, we recommend that you keep beet steaming times to 15 minutes or less, and roasting times under an hour. In recent lab studies on human tumor cells, betanin pigments from beets have been shown to lessen tumor cell growth through a number of mechanisms, including inhibition of pro-inflammatory enzymes (specifically, cyclooxygenase enzymes) [17-19]. The tumor cell types tested in these studies include tumor cells from colon, stomach, nerve, lung, breast, prostate and testicular tissue. While lab studies by themselves are not proof of beets' anti-cancer benefits, the results of these

studies are encouraging researchers to look more closely than ever at the value of betanins and other betalains in beets for both prevention and treatment of certain cancer types.

Complementary therapies are used to support medical treatments. It is used to reduce symptoms and drug-related side effects, to improve quality of life, and to receive physical and psychological support. The use of complementary therapy varies depending on age, education level, income status, cancer stage, physical activity, diet, cultural differences, geographical region and ethnicity [20]. This review is organized to raise awareness about complementary and alternative treatment methods used by patients suffering from different cancer types in the world and in our country.

CONCLUSION

Cancer, a disease that can cause the most deaths in terms of public health, is one of the cardiovascular diseases in the list of known deaths. According to Otto Warburg, cancer has a root cause. This is the replacement of the aerobic respiration of the body's normal cells with anaerobic cellular respiration. What else does Warburg's discovery tell us? First, cancer metabolizes very differently from normal cells. Normal cells need oxygen; cancer cells avoid oxygen. Hyperbaric oxygen therapy is a method used in clinics that apply alternative cancer treatment. Cancer is a disease that occurs when cells in an organ or tissue divide and multiply irregularly. In general terms, cancer constitutes more than 100 disease groups that are caused by the uncontrolled proliferation of cells in various parts of our body. For this reason, Cancer causes heavy losses in the country's economy and workforce. In this respect, an important public It always keeps its place on the agenda as a health problem. It always protects its place on the agenda as a health problem. Beetroot (*Beta vulgaris* L.) is one of high-nutrient vegetables used for salads and juices, and a valuable source of natural pigments. Phytochemicals present in beetroot are found to be beneficial for the human health. Betalains, pigments derived from betalamic acid, are an important group of bioactive phytochemicals in beetroot. As a source of polyphenols, flavonoids, dietary nitrates and other useful nutrients, beetroot supplementation may provide a holistic means to prevent cancer and manage undesired effects associated with chemotherapy [21,22]. Thanks to the antioxidant properties of betalain in the content of red beet, it fights these free radicals, and thanks to this feature, it protects the heart and fights cancer. The current review highlights the various processes in which nutrient intake could modulate directly or indirectly the immune system and/or the growth of

cancer. Many scientific studies have shown that beetroot juice affects many types of cancer and eliminates the factors that cause cancerous tumors [23,24]. Accordingly, it significantly reduces the risk of developing cancer, especially leukemia, lung, breast, skin and prostate cancer. In many experiments on animals, it has been proven that it has inhibitory properties especially in large intestine, nervous system, stomach, lung, breast, prostate and pancreatic cancers.

Beet juice help to kill cancer cells by inhibiting the formation of nitrosamines also increasing oxygen intake by cells, which provide cellular respiration which help to kill cancer cells [25]. It is one of the rare foods that can affect DNA health due to its very high antioxidant properties. Evidence based on current studies shows that beetroot and beet juice are good for cancer patients receiving chemotherapy. A healthy diet is very important for cancer patients. Getting the nutrients you need such as protein, carbohydrates, fat, vitamins and minerals will help you fight your disease. Many people survive for many years after cancer treatment. For this reason, healthy nutrition and being physically active are important for you to spend the rest of your life more dynamic and healthy. Getting the nutrients you need such as protein, carbohydrates, fat, vitamins and minerals will help you fight your disease.

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You may not be able to change your genetic makeup. But you can change your eating habits, physical activity duration, and other environmental factors. By focusing on the factors you can change and trying to change them, you can start the change right away. I wish you healthy, happy and peaceful days.

As mentioned above, betalains, antioxidant and anti-inflammatory agents are important in lowering blood pressure in patients and playing a role in preventing the invasion of cancer cells. More studies are needed to better understand the biological functions of red beet extracts and betalains.

HIGHLIGHTS

Betanin in red beet shows high antioxidant properties. This helps prevent breast and prostate cancer. Beet consumption enables the body to develop a protective shield against cancer.

Red beets, which consume antioxidant foods, can develop at the beginning of the miracle. Betalain, which gives beet its

red color, is an effective antioxidant. It contains vitamins A, B6, B12, C, E and K.

At the same time, beetroot, which contains many minerals such as phosphate, has a protective role against cancer.

While positively affecting the work of the 'mitochondria', which are the intracellular respiratory devices, it mitochondria disrupts the mitochondria of cancer cells. Two things need to happen for this to happen; the first is that the active molecules in red beet can mix with the blood and intercellular fluids, and the second is that they can distinguish normal cells from cancerous cells, which can do both.

Second, it is selective and has been shown to cause different changes in normal cells and cancer cells at the cellular level.

For example, in a study conducted at the University of Madison Wisconsin in the United States, beetroot extract protected normal cells against free radicals with very dangerous oxidizing, 'corrosive' effects by activating phase 2 enzymes at the cellular level, and in another study proven in the journal Cancer Letters, red beet extract was found in the lung and turned out to cause skin cancer.

Red beetroot is the primary source of betalains in western diets, as this is not widely present in the plant world. Furthermore They are not carcinogenic and mutagenic and are anti-mutagenic against the direct acting mutagen.

There has been a growing interest in the anticancer properties of beets and the use of beet products or their ingredients as dietary supplements for cancer prevention. Among the different atypical mechanisms underlying the chemopreventive attributes of beetroot at the cellular level, the anti-inflammatory, antioxidant, proapoptotic, antiproliferative and free radical-scavenging mechanisms have been investigated.

Beetroot is a popular food. It is widely used for cancer patients worldwide. In treatment and chemoprevention, your treatment is therapeutic. It can be evaluated to benefit from this product useful, anti-inflammatory and use, and can be used for the future to graduate from the future process. This is also his red-colored "phytochemical beet", a possible chemopreventive use as a food, and its health benefits have already been targeted and relevant research areas in this regard.

The protective effect of red beet (*Beta vulgaris*), especially on iron metabolism in cancer patients and individuals with severe anemia, has also been proven by health authorities in terms of traditional medicine and public medicine. Traditional medicine experts in all European countries recommend using beets and also used in treatment of colon, liver, kidneys, and stomach cancer of human.

As a result, the natural juice of red beet and several of its fractions have been proven to be useful nutritionally in mammals. Especially fruit juice the most effective, anti-anemia, anti-ischemic, anti-inflammatory, antioxidant and anti-carcinogenic product.

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