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NUTRITIONAL THERAPY IN PATIENTS WITH STOMACH CANCER

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ABSTRACT

This study aims to evaluate how food and nutrition can improve the quality of life of people with gastric cancer, since these patients are faced with various nutritional problems, among them, low weight, and malnutrition. The study is methodologically constituted as a qualitative approach and bibliographical research. The techniques used were discussion and interpretation from the reading of articles on the subject published in SCIELO (Scientific Electronic Library), Pub Med., Service of the National Library of Medicine). exploring the data of the results that discuss the subject in question. The study found that nutritional care leads to an improvement and well-being in the quality of life of patients affected by stomach cancer. Thus, nutritional monitoring can provide a reduction in the adverse effects of treatment and the risk of malnutrition, improving treatment tolerance, quality of life and prognosis.

Keywords: Nutritional care. Stomach cancer. Food prescription.

1 INTRODUCTION

The present work seeks to study the benefits that nutrition promotes to patients with stomach cancer, a disease that is characterized by disordered cell growth, the result of changes in the human genetic code. About 5% to 10% of tumors are the direct result of cancer-related genetic inheritance, and most cases involve the destruction of genetic material whose origins may be physical,

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chemical, or biological. The most common forms of cancer occur due to the interaction between endogenous and exogenous factors, the most notable of which are diet and lifestyle. (MUNHOZ et al., 2016) considers that the carcinogenic process is triggered by irreversible changes in DNA, and its replication and cell proliferation, so that mutagenesis and carcinogenic processes are usually linked.

Carcinogenesis is defined as the process of transformation of normal cells into malignant cells, and carcinogens are substances that induce this process. Repeated and long-term exposure to carcinogens is often necessary for the development of malignant tumors. (DUSMAN et al., 2012).

Gastric cancer is considered a catabolic disease, in which the tumor acts by depleting food nutrient reserves, which leads to poor nutrition and poor clinical prognosis. Thus, stomach cancer is considered the fifth most common tumor in the world due to its high morbidity and mortality and when it is not diagnosed at an early stage, the chance of survival is reduced due to its advanced state.

Cancer usually occurs in the lining of the stomach, more specifically in the mucosa. This type of cancer is diagnosed by histopathological analysis of the lesion by biopsy, however, these initial changes rarely cause symptoms, so they are often not noticed in the early stage, and in most cases, it is diagnosed at an advanced stage, with a low rate of survival. In addition, adenocarcinoma is responsible for 95% of gastric tumors. (OLIVEIRA et al., 2016, VALLE et al., 2017, FERRAZ, et al., 2012).

In this sense, nutritional therapy aims to alleviate the presence of gastrointestinal symptoms in patients undergoing treatment for gastric cancer, considering that the risk of malnutrition increases, as the pathology interferes in the process of food digestion and nutrient absorption. Thus, in order to promote prevention and, consequently, assist in the therapeutic response and promote the quality of life of cancer patients, nutritional therapy aims at the evolution of the patient, introducing changes when necessary, minimizing symptoms and providing a reduction in complications, permanence hospital and costs, so that nutritional support reduces the adverse effects of treatment and the risk of malnutrition, improving tolerance to treatment, quality of life and the prognosis of patients. (HACKBARTH et al, 2015. ALVES, 2019).

For the development of this study, the methodologies used were a

qualitative approach and bibliographic research, and the techniques used for data collection were a bibliographic survey of works published in SCIELO (Scientific Electronic Library), Pub Med. and Service of the National Library of Medicine). The option for this methodology was since it explains a problem based on references already published on the subject, according to Gil (2006, p. 65).

From the bibliographic surveys, we made the discussion based on the subject "Nutritional therapy in patients with stomach cancer". The focus in the study of the authors researched papers was to explore how the results of nutritional therapies in patients diagnosed with stomach cancer have contributed to the improvement and well-being of patients.

Thus, the objectives of the research were: to identify in the results of the articles the nutrients that are important in improving the symptoms of patients with gastric cancer; describe from the results of the articles the important nutrients provided to patients with stomach cancer; and characterize the effects of these nutrients in improving the symptoms of patients with stomach cancer.

The work is structured from this initial Introduction; from Section 2 which discusses stomach cancer; from Section 3 which presents data that identify nutrients important in improving symptoms and describes the results of nutrients important to patient improvement, presents the characterization of the effects of nutrients to patients; finally, Section 4 makes the final remarks.

2 THEORETICAL REFERENCE

2.1 Nutrients as nutritional therapy in patients with stomach cancer

Healthy eating is one of the relevant factors for human health, therefore, foods low in vitamin A and C, or even high in nitrate, or those smoked, canned with dyes or preserved in salt, are risk factors for onset of stomach cancer. Therefore, a diet rich in fresh fruits and vegetables can reduce the risk of stomach cancer. Citrus fruits such as oranges, lemons and grapefruit can be especially useful, but orange juice can change the blood rates of certain medications you use (ONCOGUIA, 2017).

For Antunes; Silva; Cruz (2010) studies show that vegetables and fruits, as they are sources of antioxidants, vitamins and minerals (chemo preventives)

are important factors in the prevention of gastric cancer". "Studies regarding the association of antioxidant vitamins and anticancer drugs show the importance of maintaining the levels of these nutrients for cancer patients. Therefore, effective nutritional interventions will allow an adequate nutritional status for the patient, so that he/she undergoes cancer treatment with a better quality of life "(SANTOS; CRUZ, 2001 apud DUTRA; SAGRILLO, 2014).

To prevent stomach cancer, a balanced diet consisting of raw vegetables, citrus fruits and fiber-rich foods is essential. In addition, it is important to combat smoking and reduce alcohol intake. (FCECON, [s.d.]) emphasizes that, "Studies regarding the association of antioxidant vitamins and anticancer drugs show the importance of maintaining the levels of these nutrients for cancer patients." Therefore, effective nutritional interventions will allow an adequate nutritional status for the patient, so that he/she undergoes cancer treatment with a better quality of life (SANTOS; CRUZ, 2001 apud DUTRA; SAGRILLO 2013).

The most investigated vitamins with chemo preventive properties are carotenoids and vitamins C and E, which function as antioxidants in biological systems. The carcinogenic process is characterized by a chronic oxidative state, especially in the promotion stage. Furthermore, the initiation phase is associated with irreversible damage to the cell's genetic material, due to free radical attack. In this way, antioxidant nutrients could reduce the risk of cancer by inhibiting oxidative damage to DNA. (DA CUNHA ANTUNES, et al., 2010).

Among the various food choices, the consumption of vegetables, fruits, grains, and cereals is directly associated with a decrease in carcinogenesis and disease progression, by the presence of nutrients involved in the antioxidant defense, with the attenuation of carcinogenic cascades (MEDEIROS et al., 2021).

Vitamin A may contribute to the attenuation of cell growth and differentiation, due to its ability to inhibit the oxidation of compounds by peroxides. Vitamin C, due to its antioxidant function, is also associated with a better prognosis and better responses to the treatment of gastric cancer, as well as zinc plays an important role as a cofactor of enzymes involved in inhibiting the production of free radicals, attenuating DNA damage and growth of diseased cells (WANG et al., 2019; SKRAJNOWSKA et al., 2019).

Natural antioxidants in diets include vitamin A, C, E and various Phyto ingredients that work differently to promote cell cycle disruption and cancer cell

death. Antioxidants from plant sources, especially carotenoids, flavonoids, phenols, and vitamins have been shown to suppress the early and late stages of carcinogenesis (GEORGE et al., 2020).

Epidemiological studies indicate that, in addition to a varied diet with high consumption of fruits, vegetables and fiber, low consumption of some types of fat and moderate caloric intake, the practice of physical activity is closely related to reduced risk of various types of cancer (ATTOLINI et al., 2010).

Vitamin E can prevent the spread of chain reactions induced by free radicals in biological membranes, preventing degenerative diseases such as cancer. Oxidative damage can be inhibited by the antioxidant action of this vitamin, together with glutathione, vitamin C and carotenoids, constituting one of the main mechanisms of the body's endogenous defense (DO NASCIMENTO et al., 2015).

Arginine is a conditionally essential amino acid that has shown several important pharmacological effects as well. A review carried out on the use of arginine in elective surgeries, mostly for malignant neoplastic disease of the gastrointestinal tract or head and neck, showed that arginine supplementation reduced the risk of infections, minimized the occurrence of complications in the postoperative wound and reduced the length of stay after surgery (MARIK et al., 2010).

The most investigated vitamins with chemo preventive properties are carotenoids and vitamins C and E, which function as antioxidants. The carcinogenic process is characterized by a chronic oxidative state, especially in the promotion stage. Furthermore, the initiation phase is associated with irreversible damage to the cell's genetic material, due to free radical attack. Thus, antioxidant nutrients could reduce the risk of cancer by inhibiting DNA damage (OLIVEIRA et al, 2014).

Vitamins C and E are important antioxidants, which slow down initiation or prevent the spread of free radicals. Vitamin E is especially important in preventing lipid peroxidation, while vitamin C effectively reacts with superoxide and hydroxyl radicals. This vitamin also plays an important role in the reduction of chromanoxyl radicals and in the regeneration of vitamin E. An important mechanism in the prevention of cancer caused by ascorbic acid is its ability to inhibit the formation of N-nitrous compounds (CESAR et al., 2011).

Fruits are, along with vegetables, the most effective anticancer foods. Hundreds of scientific investigations carried out around the world have proven that abundant fruit consumption can prevent most types of cancer that affect human beings. All vegetables protect against cancer to a greater or lesser degree. Its richness in vitamin A, vitamin C and photochemical elements of antioxidant action explains its anticancer effect (HYPPOLITO et al., 2014).

2.2 Nutrients in improving symptoms

The combined supplementation of vitamin E, β -carotene and selenium showed benefits for individuals from populations with low consumption of micronutrients and with reduced plasma concentrations of carotenoids, with a 21% reduction in mortality from stomach cancer" (BLOT, 1993 apud BOMFIM et al. 2014).

High intake or plasma levels of antioxidants (carotenoids, vitamins C and E, vegetables of the genus *Allium* and selenium are associated with reduced risk of gastric cancer, inhibition of tumor size and regression of precancerous lesions" (ANTUNES; SILVA; CRUZ, 2010).

Selenium reduces the risk of gastric cancer, due to its presence in the composition of the antioxidant enzymes glutathione peroxidase and thioredoxin reductase, which inhibit the cancer initiation process and strengthen the body's immune response. Selenium supplementation is necessary when the patient is deficient in this mineral" (ANTUNES; SILVA; CRUZ, 2010, p. 372 apud SBEGHEN et al. 2011).

Evidence shows that *Allium* vegetables, especially garlic and allyl, have preventive effects on gastric cancer, inhibiting mutagenesis with an antioxidant action, fighting free radicals, and stimulating the activity of the enzyme glutathione peroxidase" (ANTUNES; SILVA; CRUZ, 2010).

Vitamin C can inhibit the process of carcinogenesis in the stomach by neutralizing reactive oxygen species that damage DNA and inhibit the formation of nitrosamines in vivo from nitrates and nitrites used as preservatives; therefore, it is added to many industrialized products to prevent the formation of these known carcinogenic compounds". It is known that the adequacy of this vitamin is an important factor in nutritional care, as it acts as an antioxidant, being able to

inhibit the formation of hydroxyl free radicals and protect against lipid peroxidation, preventing the formation of potential carcinogens by mechanisms of structure alteration, target tissue prevention and competitive inhibition. (BRETÓN, et al., 2018).

It is essential to follow a balanced diet, consisting of raw vegetables, citrus fruits, and fiber-rich foods from childhood to prevent gastric cancer. Ascorbic acid (vitamin C) and beta-carotene (vitamin A precursor), found in fresh fruits and vegetables, act as body protectors against stomach cancer, as their antioxidant action prevents nitrites from becoming nitrosamines (DE SOUZA et al., 2017).

Flavonoids are phenolic compounds that occur widely in plant foods such as fruits and vegetables, tea, wine, and cocoa products. In vitro, high doses of flavonoids showed strong anticancer properties, particularly due to their ability to modulate the metabolism of carcinogens, regulating inflammatory pathways, inhibiting cell proliferation, and inducing apoptosis (LEITE et al., 2021).

2.3 The importance of nutritional therapy

For Godoi and Fernandes (2016-2017), Nutritional therapy has undergone major changes in recent decades, through technological innovations that have increased its effectiveness and minimized the risk of complications. Nutritional assistance is highlighted as one of the areas of great importance in patient therapy, with an emphasis on Nutritional Therapy (TN) due to its relevance in the treatment and prognosis of various clinical and surgical diseases in chronic, acute and critical patients. NT is essential to prevent or treat malnutrition, contributing to the reduction of infectious complications, poor healing and pressure ulcers, length of stay, hospital costs and mortality (MARSHALL et al., 2014)

Monitoring and specific nutritional therapy for cancer patients is of great importance, aiming at adequate caloric and nutrient intakes, whether through enteral nutritional support, orally or both. The goal is not to prevent or alleviate malnutrition, as nutritional therapy is directly related to its recovery, seeking to gain weight, prevent nutritional deficiencies and, finally, help with successful treatment. (RODRIGUES et al., 2012).

Nutritional therapy helps to prevent malnutrition and minimize the side effects of the treatment, aiming at providing calories according to individual

needs, as well as the fractionation and consistency of the diet, based on patient acceptance, with adaptations when necessary (TORRES; FERREIRA, 2009 apud BOMFIM et al. 2014).

The assessment of the nutritional status of cancer patients provides parameters for calculating the needs and elaborating the therapeutic plan, being of relevant importance for the treatment, since nutritional deficits interfere in the tolerance to the therapy used, limiting the dose and effectiveness of cancer treatment in reason for organic damage, such as gastrointestinal toxicity, by the production of free radicals, which reduce the desired effects, which may lead to the individual's death" (SANTOS; CRUZ, 2001 apud BOMFIM et al. 2014).

Nutritional assessment serves as an instrument of great importance for determining clinical and dietary therapy to be used to correct the nutritional deficit observed in some patients (AUGUSTO, 1995 apud DUTRA; SAGRILLO, 2013). For SANTOS et al (2017).

Malnutrition is a complication of cancer of the digestive tract, which in turn hinders the absorption of nutrients in the body due to malabsorption syndrome, and atrophy of the gastric and intestinal mucosa, which further compromises the nutritional status of patients. The purpose of nutritional assessment is to gather adequate information to make a professional judgment about nutritional status. Nutritional assessment is the first stage of the nutritional treatment process (A.S.P.E.N., 2002; LACEY; PRITCHETT, 2003 apud CAMARGOS et al. 2016).

Nutritional therapy should prioritize the needs and preferences of cancer patients. Health professionals, caregivers and family members involved in the treatment of patients should not feel powerless in relation to hydration and nutrition. At this stage, patients need words, affection and loving gestures, aiming to alleviate suffering and quality of life (MELLO, 2014).

Nutritional therapy (TN) is a determining factor as a support measure in combating cancer, as it can prevent or reverse the symptoms caused by the tumor or its treatment. Aiming to maintain and/or restore the patient's good nutritional status, in an adjuvant form to anticancer treatments. Strategies consist of monitoring and nutritional education, nutritional supplements, and diets according to the patient's needs. In palliative care, nutritional intervention focuses on alleviating symptoms, prioritizing the patient's desire to their nutritional needs, aiming at quality of life (DA SILVA et al., 2014).

The purpose of nutritional support is to maintain the metabolism of cells, organs and tissues, ensure their normal functions in the regulation of physiological processes, facilitate tissue repair, promote patient rehabilitation and reduce medical costs (HUANG et al., 2015).

Nutritional therapy (TN) is recommended for the prevention of malnutrition, maintenance, or recovery of the nutritional status of cancer patients, as well as intervening to reverse metabolic and nutritional disorders that hinder the improvement and survival of these individuals. In addition, NT aims to positively help the response to cancer treatment and control its side effects, improve immune response, reduce hospital stay and promote quality of life (GUILHERME et al., 2020).

3 RESULTS AND DISCUSSIONS

3.1 The important nutrients for patient improvement

For nutritional therapy in patients with cancer of the digestive system, Goodoi and Fernandes (2017) present the following methods and types of nutrients for the treatment of cancer patients:

Table 1. Nutrients

Types of methods and nutrition	Concept
enteral nutrition (EN)	EN is the treatment method designed for people who cannot or cannot feed themselves completely by mouth, as they rely on the integrity of their digestive system.
parenteral nutrition (PN)	NP is the method of administering nutrients that is done directly into the patient's vein when it is not possible to obtain nutrients through normal food.
Energy	It is the way to assess resting energy expenditure (REE), the thermic effect of food or diet-induced thermogenesis (TID) and the caloric cost of physical activity.
lipid and carbohydrate	They are the main energy substrates for the patient's body, which are produced from food.
Protein	They are substances formed by a set of amino acids linked together through peptide bonds found in a variety of foods.
Nutraceuticals	They are types of food supplements that contain in their compositions bioactive compounds that were extracted from food and that have benefits for the human body.

Fonte: Goodoi e Fernandes (2017).

For Goodoi and Fernandes (2017), nutritional therapy, even at an early stage, provides beneficial results in terms of minimizing weight loss and reducing the deterioration of the patient's nutritional status and physical function. Thus, whenever possible, the first choice of nutritional treatment should be taken orally. However, patients who are malnourished and/or who are unable to ingest the calculated caloric and protein offer orally may be submitted to enteral nutrition (EN) or parenteral nutrition (PN), as recent studies have suggested the association of enteral and parenteral therapy in reductions in postoperative complications and reductions in hospital stays.

Thus, nutritional support can be through enteral nutrition (EN) and/or parenteral nutrition (PN), and, in most cases, EN is the most used method because it is more physiological and has lower cost and fewer complications to the patient.

3.2 The characterization of the effects of nutrients on patients

The characterization of the effects of nutrients on patients with stomach cancer is aimed at improving the patient's well-being, but sometimes adverse reactions can occur.

Lipids, carbohydrates, and proteins are macronutrients present in food and provide energy that are used for the functioning of the body's vital functions, such as breathing, circulation, protein synthesis, cell renewal and physical work. Nutraceuticals, on the other hand, are bioactive compositions that can be used to meet the body's needs, and are found in capsules, nutraceutical combination compotes. Some of these more common nutrients are omega-3, lycopene, resveratrol, phytosterols, probiotics, vitamins and minerals, and fiber.

For Goodoi and Fernandes (2017), nutraceuticals are compounds that participate in various processes in the human body and have several benefits and can also be indicated in various situations, including the regulation of cholesterol levels and prevention of the development of cardiovascular diseases, improving bowel function, and promoting gastrointestinal health, improving bone health and regulating blood pressure. But nutraceuticals sometimes have a higher concentration of compounds than what is found naturally in foods and,

thus, consumption without medical advice or a nutritionist, or even the use of exaggerated amounts above the recommended can have consequences for the patient's health.

5 FINAL CONSIDERATIONS

During discussions in this study, we've seen that cancer can produce many different symptoms, some subtle and some less so. They occur according to the type and stage of cancer, and some types do not show any symptoms until they are in advanced stages. If nutritional status and disease determine the patient's status, the best decision is to treat the disease and nurture the patient as early as possible.

In this sense, nutritional therapy based on a rich intake of plant foods such as fruits, vegetables, vegetables, whole grains, beans, and other legumes can prevent cases of cancer or even recover or ease the health of those who are already affected by the disease. Thus, nutritional therapy is seen in this work as a therapy that promotes and acts to improve the health situation of patients undergoing treatment.

Therefore, when answering the study proposed in the objectives of this work, we can say that the results found in the articles researched on nutrients contribute to alleviate the symptoms of gastric cancer patients, and even more, that nutrients are important suppliers of energy, carbohydrates, lipids and proteins for stomach cancer patients and the effects of these nutrients help to improve symptoms of digestive cancer patients.

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