

## Review Article

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# How to eat to avoid gastric cancer?

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## Abstract

Deaths caused by gastric cancer are in the third place among deaths caused by cancer today. Gender, family history of gastric cancer, diet and smoking are among the important risk factors for gastric cancer. There is a direct and important link between nutrition and stomach cancer. It has been experimentally shown that food additives such as nitrite and nitrate that enter the body with food cause stomach cancer. The intake of these harmful substances with food should be prevented by removing them from the diet lists. It has been proven that stomach cancers are linked to excessive salt consumption. It has been determined that high salt intake, atrophic gastritis in the presence of *Helicobacter pylori* infection, and foods containing nitroso increase the carcinogenic effects. A diet rich in energy and protein is a preferred way of maintaining and improving nutritional status. It has been proven that consumption of fresh fruits and vegetables, and foods rich in vitamins C and E have a protective effect against cancer. In order to be protected from stomach cancer, fresh foods should be consumed instead of frozen and ready-made foods. It is stated that the consumption of olive oil, which is the main source of monounsaturated fats, together with abundant plant content such as daily consumption of fruits, vegetables, whole grains and weekly consumption of legumes and nuts, with a Mediterranean style diet, is very important in order to be protected from stomach cancer. In this review article, how to eat to prevent stomach cancer is mentioned and nutritional recommendations are made.

## Introduction

Gastric Cancer (GC) is asymptomatic in the early stage and the disease is generally advanced when diagnosed [1]. When diagnosed in the late period, the prognosis is quite malignant. The best method to minimize mortality is to start the diagnosis and treatment of the disease in the early period. Gastric cancer is one of the most common types of cancer in the world chart and is the second most common cause of death from cancer [2]. GC is a multifactorial disease that can be affected by many environmental and genetic factors [3]. The best proven risk factors for stomach cancer are *Helicobacter pylori*. Infection is by far the strongest risk factor for distal gastric cancer, with infection including male gender, family history of gastric cancer, and

smoking [4]. While some factors related to diet and food preservation, such as excess intake of salt-preserved foods and dietary nitrite or low consumption of fruits and vegetables, are likely to increase the risk of gastric cancer, the quantitative impact of many nutritional factors is unclear.

Malnutrition is common in gastric cancer [5]. Every year, around 990,000 people worldwide are diagnosed with GC, and about 738,000 of them die [6]. The incidence of GC is quite different in terms of gender and geographic variability. Men are two to three times more prone than women. The incidence has great geographical variation. However, with different results obtained in various studies, researchers focused on the effects of preservatives in foods, how the foods were stored before

the type of food and what kind of methods they were cooked, and the differences in these storage and cooking habits [7]. The World Health Organization (WHO) stated that the main cause of gastric adenocarcinoma is *Helicobacter pylori* (*H. pylori*) infection [8]. Epidemiological studies and many meta-analyses have reported a strong link between *H. pylori* infection and gastric cancer. *Helicobacter pylori* is the first bacterium to be found to be a carcinogen and is a pathogen that colonizes the stomach in more than half of the world's population [9].

### Etiology of GC

In the etiology of gastric cancer, it is said that the type of food consumed together with the conditions of preparation and storage of foods is also an important risk factor [10]. In addition to these, increasing the quality of life and prolonging the life span by strengthening the response to the disease and treatment in people with gastric cancer are also related to nutrition. The etiology of gastric cancer has not been definitively found [11]. It is thought that environmental and genetic factors prepare the ground for its development. The possibility of developing stomach cancer increases with the consumption of high-carbohydrate foods at an early age; It is thought that this type of nutrition causes damage to the gastric mucosa and accelerates the absorption of carcinogenic substances.

### Symptoms of GC

Rare symptoms are generally not encountered in the early stages of the disease [12]. The stomach wall is very mobile, so tumors can become large before they cause problems. Early symptoms are indigestion and widespread pain in the epigastrium. Burnout, anemia, loss of appetite, early fullness, vomiting, pain that does not go away with food intake are common symptoms of GC. Moderate weight loss advanced disease symptoms and the pain in the back at the thoracic-lumbar transition when there is invasion of the pancreas/posterior abdominal wall. The retention of solid food in the esophagus or stomach cuses depending on the localization of the stenosis. Also, significant anemia, ascites (significant spread into the peritoneum), possibly from peritoneal carcinoma with ileus, significant weight loss and jaundice were seen in GC patients.

### Diagnostic methods of stomach cancer

Gastric cancer is still an important global health problem [13]. In general, the survival rate of patients with GC is poor mainly due to advanced diagnosis. Early stage GC can be treated with endoscopic resection or less invasive surgical treatment. Unfortunately, a suitable screening strategy for global application has not yet been found. Early diagnosis of gastric cancer is difficult because, in general, patients are asymptomatic at an early stage [14]. Weight loss and abdominal pain are generally late symptoms of tumor progression.

Chronic atrophic gastritis, *Helicobacter pylori* infection, smoking, excessive alcohol consumption, and various nutritional factors have been associated with an increased risk of gastric cancer. It is critically important to diagnose the disease at an early level in order for a drug treatment to be carried out [15]. Ideally, disease should be prevented before premalignant lesions appear, either by reducing and eliminating risk factors or by monitoring and managing premalignant (precancerous) conditions. Next, both current and potential strategies that can

help achieve this goal should be reviewed, taking into account their advantages and disadvantages.

### Dietary approaches to prevent stomach cancer

There is a direct and important link between nutrition and gastric cancer [16]. It has been proven that stomach cancers are associated with excessive salt consumption, and consumption of fresh vegetables and fruits, and foods rich in vitamins C and E have a protective effect against cancer. It has been experimentally shown that nitrates and nitrites that enter the body with food cause intestinal metaplasia in the stomach and cause gastric cancer. Preventing the intake of these harmful substances with food can be a preventive measure, especially in high-risk areas. Diets with a high content of plant matter, as well as high consumption of antioxidants, are associated with a reduced risk of developing gastric cancer [17]. High consumption of animal products is associated with increased risk.

Fruits and Vegetables (F&V) are thought to protect against gastric cancer [18]. Various carotenoids have proven anti-cancer properties. The importance of having a citrus fruit in the diet, along with vegetables and fruits rich in carotene, against cancer is particularly emphasized. However, 2 recent meta-analyses note that the potency of its effect on GC is weaker for vegetables than for fruit and more ineffective in the cohort than in case-control studies. Plant foods such as broccoli, cauliflower and cabbage also reduce the risk of cancer [19]. Anti-cancer effects help prevent cancer due to the glucosinolates they contain. Phytochemicals such as indole, isothiocyanate, and sulforaphane trigger enzymes that inhibit and prevent cellular DNA damage, restrict tumor size and the activity of estrogen-like hormones. It is stated that the consumption of onions and garlic prevents the development of stomach cancer. The catechin in tea reduces the risk of cancer. The tea with the highest catechin content is green tea. It has been shown that the incidence of gastric cancer is reduced in Japanese who reduce their salt consumption [20]. Fresh, green-yellow vegetables and milk are protective factors. There has been a significant decrease in the incidence of gastric cancer with the development of new methods for storing food outside the refrigerator, limiting the use of smoking and salt, and consuming a large amount of fresh vegetables and fruits. For patients with gastric cancer, healthy diets have been proposed that mainly support the consumption of F&V, soy products, seaweed products, milk and yogurt [21].

Those at high risk of cancer if the presence of stomach cancer in the family, blood type, male gender, smoked salty food and low consumption of vitamin C, high cabbage diet, achlorhydria, low socioeconomic level, low intake of vitamin A, smoking and alcohol can be seen as the reasons for habituation. Especially high levels of proteins obtained from complex cereals, low levels of animal fat and proteins in the diet, infrequent eating of fibrous and fresh green plants, excessive consumption of salt and nitrate were predicted as factors that facilitate the development of gastric carcinoma.

The Mediterranean diet model is also defined as a healthy diet model due to its balanced nutrient pattern and sustainability [22]. The Mediterranean diet model contains many compounds and nutrients that have antioxidant properties and can reduce tumor growth. Although there are ideas that different nutrients in the diet may be protective against cancer alone,

the health benefit attributed to the Mediterranean diet model comes from the total benefit of the diet, not from a single nutrient type. At the same time, not including processed products in the diet and not using cooking methods that trigger the formation of harmful compounds can be counted as extra benefits of the diet. With the Mediterranean diet pyramid, which was updated in 2011, the frequency of consumption of the basic food groups in this nutrition model and the amounts that should be consumed were emphasized again.

The Mediterranean diet is considered to be protective against coronary heart disease and cancer because it contains less saturated fat that raises blood cholesterol, contains olive oil that is resistant to oxidation and does not increase blood lipids, is rich in alpha-linolenic acid, which prevents blood clotting, and is rich in antioxidants that prevent LDL-cholesterol oxidation [23].

### Recommended supplements to be used in addition to nutrition

Arginine, n-3 polyunsaturated fatty acid, glutamine etc. Immune nutrition, especially preoperatively administered, is a promising nutritional therapy to reduce post-operative infectious complications [24]. Adding immune/metabolic modulating formulas with carbohydrate drinks at the week of surgery to optimize glycogen accumulation just prior to surgery improves patient recovery and return to basic function [25]. Such nutritional tactics must now be integrated with a range of other practices (such as smoking cessation, weight loss, glucose control, and a tailored exercise program) as part of a tailored protocol to maximize patients' health.

Nutritious drinks can be preferred alone or between meals [17]. Nutritional drinks can be a more valuable alternative to "normal" meals because drinking is generally more convenient for the patient than eating. When nutritious drinks are consumed as a snack, it has been observed that there is no deficiency in energy intake in main meals. Today, there is a wide variety of ready-to-drink beverages with high nutritional value. Some of the products are quite perfect in terms of nutritional value. They contain carbohydrates, protein and fat and are packed with all essential vitamins, minerals and trace minerals and fiber.

### Alternative foods especially desired to consume

It is biologically possible for a link between dietary iron intake and GC. Since iron deficiency can increase pH activity, the carcinogenicity of iron has been studied in animal models supporting the inverse hypothesis [26]. On the one hand, there is increasing consideration of the potential carcinogenicity of excessive dietary iron intake, possibly related to the effect exerted by the heme component, particularly in red meat. In addition, free iron (non-protein bound) can act as a prooxidant, generating reactive oxidative species, which can cause oxidative DNA damage. In addition, heme iron is led by the production of N-nitroso compounds, which are gastric carcinogens.

The use of metformin has been suggested in the etiology, progression or prognosis of various types of cancer [27]. Most studies investigating Gastric Cancer (GC) hazard have reported a protective effect of metformin use, while others have not reported any association. In addition, previously published meta-analyses have generally shown that metformin use can lower the risk of GC.

## Conclusion

In order to prevent GC, individuals should stay away from food additives and processed foods. In addition to this, it should be pay an attention to excessive salt consumption, cooking methods, and plant-dense nutrition.

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