

Connection Between Cancer and Celiac Disease

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Key Words:

Celiac disease, gluten, cancer, gluten free diet

Celiac Disease (CD) is an chronic autoimmune disease that affects millions of Americans. CD is triggered by the ingestion of gluten. Gluten can be found in wheat, rye, and barley. Celiac Disease is known to have a number of complications, including abdominal pain, nausea, diarrhea, etc. While Celiac Disease is primarily a gastrointestinal disorder, research has shown that it may also be associated with an increased risk of certain types of cancer. In this paper, we will explore the relationship between celiac disease and cancer, including the types of cancer that are most commonly associated with CD, the recent progress that researchers have made in determining the correlation between cancer and CD, and strategies for reducing the risk of cancer in people with Celiac Disease.

Introduction

Celiac Disease (CD) is a genetic chronic inflammatory disease. When someone with CD consumes gluten, their immune system attacks the villi of the small intestine, which causes damage and inflammation. Gluten is found in diets containing wheat, barley, or rye. A gluten-free diet is a necessity for a person with CD, in order to live a healthy and normal life. The symptoms of gluten ingestion by a CD person can include diarrhea, abdominal pain, bloating, and weight loss. People with CD may have higher levels of pro-inflammatory cytokines, which are proteins that signal the immune system to produce inflammation (Kany, et al 2019). Therefore people with celiac disease have chronic inflammation. The persistent inflammation in the body of patients with CD can then increase the risk of other health problems, including cancer. CD has been linked to a majority of cancers including esophageal cancer, colorectal cancer, small bowel adenocarcinoma, and lymphoma. The risk of developing cancer is higher in people with CD who have not been diagnosed or treated for an extended period of time, and the risk decreases after maintaining a gluten-free diet.

Cancer is a life-threatening disease characterized by the uncontrollable growth and spread of abnormal cells in the body. Naturally, cells in the body grow and divide in a controlled manner that replace damaged cells. However, cancer cells grow rapidly, which the body cannot handle. Cancer cells form a mass of cells called a tumor. A healthy and functioning immune system plays a critical role in fighting cancer because it is responsible for recognizing and eliminating cancer cells, as well as other infected cells. However, people with CD have a weaker immune system that affects nutritional deficiencies that can impact the immune system's ability to fight cancer. For example, deficiencies in iron, vitamin B12, and folate, which are common in people with CD, can affect the production and function of immune cells that are essential for fighting cancer. Therefore, people with autoimmune diseases such as CD are at a higher risk of developing cancers.

Recent Progress

As stated above, patients with CD typically have nutritional abnormalities that can cause secondary diseases, one being esophageal cancer (Kalra, et al. 2022). It can affect the muscular tube that connects the throat and stomach, causing pain and inflammation. Esophageal

cancer can develop when cells in the lining of the esophagus grow and divide uncontrollably, forming a tumor. There are two main types of esophageal cancer: squamous cell carcinoma and adenocarcinoma. Adenocarcinoma is influenced by gastroesophageal reflux disease, CD, and obesity. Untreated CD may increase the risk of gastroesophageal reflux disease. People with celiac disease are more likely to experience gastroesophageal reflux, especially when a gluten free diet is not maintained. The constant gastroesophageal reflux and poor immunity in people with untreated CD increases the risk of developing esophageal cancer substantially.

In addition to esophageal cancer, researchers found that there is some evidence to suggest that people with celiac disease have a slightly increased risk of developing colorectal cancer. One study found that patients with CD have a increased risk of developing colorectal cancer compared to non-celiac healthy controls. (Ivanova, et al. 2023). Colorectal cancer is a types of cancer that affects the colon (large intestine) or rectum. It is the one of the most common cancers and is often linked to lifestyle factors such as diet. The reason for the increased risk of colorectal cancer in people with CD is not entirely clear. The chronic inflammation and damage to the lining of the small intestine that occurs in celiac disease may be responsible for the increased risk of developing cancer in the other parts of the body including the colon and rectum.

Celiac disease mainly affects the small intestine, especially in those who do not follow a strict gluten-free diet. The ingestion of gluten can permanently damage the villi in the small intestine. The small intestine is responsible for absorbing nutrients from the food we eat. Damaged villi in the small intestine are not able to absorb nutrients as well. Since CD can alter the small intestine, the duodenum, jejunum and ileum are at a higher risk of malabsorption of nutrients. In more severe cases, the damage to the small intestine in celiac disease can have significant health consequences if left untreated, one consequence being small bowel adenocarcinoma. Small bowel adenocarcinoma (SBA) is a rare type of cancer that develops in the cells of the small intestine. The exact cause of SBA is not entirely clear, but risk factors may include Chron's disease, celiac disease, or other underlying diseases (Kalra et al. 2022). Also, people with celiac disease often have a higher risk of other gastrointestinal cancers, such as esophageal cancer.

In addition, patients with CD have a high risk of developing lymphoma (Ivanova, et al. 2023). Lymphoma is a type of cancer that begins in cells of the lymphatic system. The lymphatic system is made up of lymph nodes, lymphatic vessels, and lymphatic organs, which work together to fight infection and disease. Lymphoma occurs when

lymphocytes, a type of white blood cells, grow and divide uncontrollably, forming tumors in the lymph nodes or other parts of the lymphatic system. Lymphoma is a rare but serious complication of celiac disease. The risk of lymphoma is higher in people with celiac disease who have not been diagnosed or followed a gluten free diet for an extended period of time. The risk decreases significantly after adopting a gluten-free diet. The risk is highest for people with celiac disease who are slow to heal their small intestine. Intestinal damage, after following a gluten free diet is rare, but can increase the chances of developing lymphoma. Individuals who are unaware of their disease have the highest risk of developing lymphoma, because they do not follow a gluten free diet. The most common type of lymphoma associated with celiac disease is non-Hodgkin lymphoma, which can occur in the lymph nodes, spleen, bone marrow, and other organs. In many cases lymphoma may be the first sign of celiac disease.

Discussion

These recent findings are important for understanding how cancer can take advantage of an unhealthy individual. Each cancer is stimulated by the effects of CD. Since CD affects multiple organs in the body, cancer has the ability to develop in many places including the colon, breasts, rectum, esophagus, etc. Future research into how gender and age associated with celiac disease affects the rate of developing cancer is essential. The exact mechanisms by which celiac disease increases the risk of cancer are not fully understood. However, it is thought that the chronic inflammation and damaged to the intestinal lining caused by gluten exposure may contribute to the development of cancer. Gluten exposures can occur orally or topically for people with CD. A gluten free lifestyle is extremely tedious and important for a person with CD to abide by. As mentioned earlier, a person with CD not abiding by the gluten-free diet, increases the risk of a developing esophageal cancer, colorectal cancer, and intestine adenocarcinoma.

Currently, there is not a cure for CD. However, a gluten-free diet is the primary treatment for people with CD. A gluten free diet can reduce the symptoms significantly. A patient with CD can live a fulfilled and healthy life once the small intestine is healed from a proper diet. It has been found that following a strict gluten-free diet causes a complete mucosal healing of the small intestine (Kalra, et al. 2022). A healed small intestine can absorb nutrients better, providing fuel for the innate and adaptive immune system. It is important for person with CD to follow a strict gluten-free diet in order to lower their chances of developing cancer. Healthier individuals have stronger immune responses and are more likely to be successful at fighting off cancer.

It is also important to note that CD patients show an increased prevalence of autoimmune disease and present an overlap of genes with Chron's disease, ulcerative colitis, type 1 diabetes, rheumatoid arthritis, and lupus, which potentially could contribute to tumorigenesis. Tumorigenesis could be a combination of many things and not limited to CD being a single factor. In addition, other factors can be associated with an increased risk of cancer including smoking , alcohol consumption, obesity, etc. Screening and early detection of cancer is important for all individuals, including those with CD.

Majority of people with celiac disease are unaware that they have it. Therefore their risk of developing cancer and other secondary diseases are increased. In some cases, patients find out they have celiac disease after being diagnosed with cancer. Physicians need to consider testing for celiac disease more often, as many patients are asymptomatic. However, it is essential for people with celiac disease to discuss and any concerns about cancer risk with your healthcare provider and to follow recommended cancer screening guidelines. Screening test such as mammograms and colonoscopies, can help detect cancer at an early stage when it is more treatable.

References

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