

Gastric Cancer: Early Detection, Challenges and Treatment Advances

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Editorial

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Symptoms and early detection

The symptoms of gastric cancer often go unnoticed in the early stages, making it difficult to diagnose until it has reached an advanced stage. Some of the most common symptoms include persistent stomach pain, bloating, nausea, difficulty swallowing, unexplained weight loss and blood in the stool. Unfortunately, these symptoms can easily be attributed to less severe conditions such as gastritis, ulcers or indigestion, leading to delays in seeking medical attention.

Because the disease is often diagnosed at later stages, when it has already spread to nearby organs, gastric cancer has a relatively low survival rate. Early detection is crucial for improving prognosis, yet screening methods remain limited. While endoscopy and biopsy are effective diagnostic tools, they are not widely used for routine screening due to the invasive nature and cost associated with these procedures. As a result, efforts to develop non-invasive biomarkers and blood tests to detect gastric cancer at earlier stages are ongoing.

INTRODUCTION

Gastric cancer or stomach cancer, remains one of the leading causes of cancer-related deaths worldwide, though its incidence has declined in recent decades. This malignancy typically begins in the stomach's inner lining, where abnormal cells proliferate uncontrollably. Despite significant strides in research, gastric cancer continues to present challenges in terms of early detection, treatment and overall survival. However, advancements in diagnostics, therapy and a deeper understanding of its genetic and environmental causes offer hope for improving outcomes for patients.

Understanding gastric cancer

Gastric cancer is a complex disease with multiple subtypes, but it most commonly begins in the glandular cells of the stomach lining, known as adenocarcinoma. There are other, rarer forms, including gastric lymphoma and Gastrointestinal Stromal Tumors (GISTs), but adenocarcinoma accounts for approximately 90%-95% of all stomach cancers. Gastric cancer can also be classified by its location within the stomach, whether it is confined to the mucosal lining or has spread to deeper layers and adjacent organs.

The disease is more common in older adults and typically affects men more than women. Risk factors for gastric cancer include a family history of the disease, smoking, obesity, chronic infection with *Helicobacter pylori* and a diet high in salt, pickled foods and low in fruits and vegetables. Additionally, genetic mutations and inherited conditions such as Lynch syndrome and familial adenomatous polyposis can increase the likelihood of developing gastric cancer.

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Advances in treatment

The treatment of gastric cancer depends largely on the stage at diagnosis and the location of the tumor. Early-stage gastric cancer can sometimes be treated with surgical resection, where the tumor and surrounding tissue are removed. However, the majority of patients are diagnosed with more advanced disease, necessitating a combination of surgery, chemotherapy, radiation therapy, and targeted treatments.

Surgery: Surgical resection remains the mainstay of treatment for localized gastric cancer. In cases where the cancer is confined to the stomach and has not spread to distant organs, surgery can offer a chance for cure. Procedures may involve removing part of the stomach (partial gastrectomy) or the entire stomach (total gastrectomy), along with surrounding lymph nodes to ensure that cancer cells are fully removed.

Chemotherapy and radiation therapy: For advanced gastric cancer, chemotherapy is typically used to shrink tumors, alleviate symptoms and increase survival. Chemotherapy is often combined with radiation therapy to provide a more aggressive treatment approach, especially if the cancer has spread to adjacent organs. While chemotherapy improves survival rates, it can be accompanied by significant side effects, including fatigue, nausea, and weakened immunity.

Targeted therapy: In recent years, advances in molecular biology have led to the development of targeted therapies that focus on specific genetic mutations and abnormal proteins present in cancer cells. For gastric cancer, agents such as trastuzumab (Herceptin) target the HER2 receptor, which is overexpressed in some tumors and is associated with poorer prognosis. Targeted therapies aim to selectively attack cancer cells while sparing healthy cells, leading to fewer side effects compared to traditional chemotherapy.

Immunotherapy: Immunotherapy has shown promise in treating gastric cancer, particularly for tumors that express certain genetic markers or proteins, such as PD-L1. Immune checkpoint inhibitors, which work by stimulating the body's immune system to recognize and attack cancer cells, have been used with some success in advanced stages of the disease. However, immunotherapy for gastric cancer is still an emerging field and more research is needed to determine which patients will benefit most from this approach.

Palliative care: For patients with advanced gastric cancer that cannot be treated with curative intent, palliative care plays an essential role. This approach focuses on alleviating symptoms and improving quality of life. Palliative treatments may include the use of stents to relieve obstruction, pain management, and nutritional support.

Challenges and future directions

Despite progress in the treatment of gastric cancer, several challenges remain. The disease often goes undetected until it is in advanced stages, making it more difficult to treat effectively. Moreover, gastric cancer is a heterogeneous disease, with multiple genetic and molecular subtypes, making personalized treatment strategies complex.

Research into the molecular mechanisms behind gastric cancer has revealed several key drivers, such as genetic mutations in the TP53 gene and changes in cell signaling pathways, that may lead to new therapeutic targets. The identification of biomarkers that can detect the disease at an early stage is another area of intense research, as early intervention is crucial for improving patient outcomes.

Additionally, lifestyle modifications, such as reducing smoking, improving diet and managing *Helicobacter pylori* infections, could play a role in reducing the burden of gastric cancer. Public health campaigns aimed at raising awareness of these modifiable risk factors are essential for reducing incidence rates globally.

CONCLUSION

Gastric cancer remains a significant global health challenge due to its high mortality rate, particularly in advanced stages. However, advancements in treatment, including surgery, chemotherapy, targeted therapy and immunotherapy, offer hope for better outcomes for patients. Continued research into early detection methods and personalized treatments, combined with prevention strategies, is essential for improving survival rates and reducing the burden of this disease worldwide. As science continues to uncover the complexities of gastric cancer, the possibility of more effective treatments and ultimately, a cure becomes increasingly achievable.