Rectal Cancer: Its Causes and Risk Factors in the Society as Related to Nigeria

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Abstract

Rectal cancer is a disease in which malignant (cancer) cells form in the tissues of the rectum. Age and family history can affect the risk of rectal cancer. Signs of rectal cancer include a change in bowel habits or blood in the stool. Rectal bleeding is a symptom of a problem in the GI (Gastrointestinal tract). The definition is broad as it means any blood passed rectally; consequently, the blood may come from any area or structure in the GI tract that allows blood to leak into the GI lumen (area where food and fluid is processed for absorption or removal as waste). For example, a bleeding ulcer in the stomach can have the blood excreted in the person's fecal material. Rectal bleeding may be due to problems on the rectum itself or from many other problems that occur elsewhere in the GI tract. Perirectal bleeding is bleeding in an area adjacent to the rectum and may be due to abscesses or fistulas.

Rectal cancer is the growth of abnormal cancerous cells in the lower part of the colon that connects the anus to the large bowel. Rectal cancer develops usually over years; its actual cause is not known, but risk factors include increasing age (over 50), smoking, family history, high-fat diet, or a history of polyps or colorectal cancer or inflammatory bowel disease.

Radiation therapy can be used to kill or shrink rectal cancers. Follow-up is important to make sure that rectal cancer does not recur.

Introduction

The rectum is part of the body’s digestive system. The digestive system takes in nutrients (vitamins, minerals, carbohydrates, fats, proteins, and water) from foods and helps pass waste material out of the body. The digestive system is made up of the oesophagus, stomach, and the small and large intestines. The colon (large bowel) is the first part of the large intestine and is about 5 feet long. Together, the rectum and anal canal make up the last part of the large intestine and are 6-8 inches long. The anal canal ends at the anus (the opening of the large intestine to the outside of the body). Tests that examine the rectum and colon are used to detect and diagnose rectal cancer. Certain factors affect prognosis (chance of recovery) and treatment options.

Medical treatment depends on the stage of rectal cancer. The most severe stage; multiple chemotherapy medications are available and are chosen by the specialist (oncologist) to fit the individual's stage of rectal cancer.

Rectal cancer is a disease in which malignant (cancer) cells form in the tissues of the rectum. Age and family history can affect the risk of rectal cancer. Signs of rectal cancer include a change in bowel habits or blood in the stool. Tests that examine the rectum and colon are used to detect and diagnose rectal cancer. Certain factors affect prognosis (chance of recovery) and treatment options.

The outlook or prognosis for individuals with rectal cancer is usually related to the stage of cancer, with stages III and IV having the poorest outcomes.

Histologically, adenomas are classified in three groups: tubular, tubulovillous, and villous adenomas. K-ras mutations and microsatellite instability have been identified in hyperplastic polyps. Therefore, hyperplastic polyps may also have malignant potential in varying degrees.

The other common carcinogenic pathway involves mutation in DNA mismatch repair genes. Many of these mismatched repair genes have been identified, including hMLH1, hMSH2, hPMS1, hPMS2, and hMSH6. Mutation in mismatched repair genes negatively affects the DNA repair. This replication error is found in approximately 90% of HNPPC and 15% of sporadic colon and rectal cancers. A separate carcinogenic pathway is also described in inflammatory bowel disease (IBD). Chronic
inflammation such as in ulcerative colitis can result in genetic alterations which then lead into dysplasia and carcinoma formation.

**Aim of the study**

The aim of this proposed study is not to replicate any of the initial work already conducted, but to emphasis on the causes of rectal cancer and the risk factors. This study is to determine the rapid growth of Rectal Cancer. Age and family history can affect the risk of rectal cancer, hence anything that increases your chance of getting a disease is called a risk factor. Rectal cancer develops usually over years; its actual cause is not known, but risk factors include increasing age (over 50), smoking, family history, high-fat diet, or a history of polyps or colorectal cancer or inflammatory bowel disease.

The major symptom of rectal cancer is bleeding from the rectum; other symptoms include anaemia, fatigue, shortness of breath, dizziness and/or a fast heartbeat, bowel obstruction, small diameter stools, and weight loss.

For diagnosis, exams and tests may include fecal occult blood testing, endoscopy, digital rectal examination, sigmoidoscopy, CT/MRI imaging studies, along with routine blood tests and detection of carcinoembryonic antigen (CEA).

Surgery is used to both treat and reduce symptoms and, in some individuals, may result in a remission of the cancer.

**Background to the study**

Rectal cancer incidence was negligible before 1900. The incidence of rectal cancer has been rising dramatically following economic development and industrialization. Currently, colorectal cancer is the third leading cause of cancer deaths in both males and females in the United States.

Adenocarcinomas comprise the vast majority (98%) of colon and rectal cancers. Other rare rectal cancers, including carcinoid (0.4%), lymphoma (1.3%), and sarcoma (0.3%), are not discussed in this article. Squamous cell carcinomas may develop in the transition area from the rectum to the anal verge and are considered anal carcinomas. Very rare cases of squamous cell carcinoma of the rectum have been reported.

Approximately 20% of colon cancers develop in the cecum, another 20% in the rectum, and an additional 10% in the rectosigmoid junction. Approximately 25% of colon cancers develop in the sigmoid colon.

The incidence and epidemiology, etiology, pathogenesis, and screening recommendations are common to both colon cancer and rectal cancer. These areas are addressed together.

An image depicting the staging and workup of rectal cancer can be seen below.
Pathophysiology

The mucosa in the large intestine regenerates approximately every 6 days. Crypt cells migrate from the base of the crypt to the surface, where they undergo differentiation and maturation, and ultimately lose the ability to replicate.

The significant portions of colorectal carcinomas are adenocarcinomas. The adenoma-carcinoma sequence is well described in the medical literature. Colonic adenomas precede adenocarcinomas. Approximately 10% of adenomas will eventually develop into adenocarcinomas. This process may take up to 10 years.

Three pathways to colon and rectal carcinoma have been described:
- Adenomatous polyposis coli (APC) gene adenoma-carcinoma pathway
- Hereditary nonpolyposis colorectal cancer (HNPCC) pathway
- Ulcerative colitis dysplasia

The APC adenoma carcinoma pathway involves several genetic mutations, starting with inactivation of the APC gene, which allows unchecked cellular replication at the crypt surface. With the increase in cell division, further mutations occur, resulting in activation of the K-ras oncogene in the early stages and mutations in later stages. These cumulative losses in tumor suppressor gene function prevent apoptosis and prolong the cell's lifespan indefinitely. If the APC mutation is inherited, it will result in familial adenomatous polyposis syndrome.

The HNPCC which involves the Age and family history can affect the risk of rectal cancer. Anything that increases your chance of getting a disease is called a risk factor. Having a risk factor does not mean that you will get cancer; not having risk factors doesn’t mean that you will not get cancer. Medical consultation will be of help if you think you may be at risk.

Rectal cancer symptoms

In the early stages of the disease, rectal cancer symptoms may be minimal, or not present at all. As the disease progresses, symptoms may increase in quantity and degree of severity. Because colorectal cancer symptoms often do not present themselves until the disease has progressed past the initial stage, Signs of rectal cancer include a change in bowel habits or blood in the stool. These and other
signs and symptoms may be caused by rectal cancer or by other conditions. The following symptoms might be present in patient with rectal cancer;

- Blood (either bright red or very dark) in the stool.
- A change in bowel habits.
- Diarrhea.
- Constipation.
- Feeling that the bowel does not empty completely.
- Stools that are narrower or have a different shape than usual.
- General abdominal discomfort (frequent gas pains, bloating, fullness, or cramps).
- Change in appetite.
- Weight loss for no known reason
- Feeling very tired.

Bleeding is the most common symptom of rectal cancer, occurring in 60% of patients. However, many rectal cancers produce no symptoms and are discovered during digital or proctoscopic screening examinations.

**Other signs and symptoms of rectal cancer may include the following:**

- Change in bowel habits (43%): Often in the form of diarrhea; the caliber of the stool may change; there may be a feeling of incomplete evacuation and tenesmus
- Occult bleeding (26%): Detected via a fecal occult blood test (FOBT)
- Abdominal pain (20%): May be colicky and accompanied by bloating
- Back pain: Usually a late sign caused by a tumor invading or compressing nerve trunks
- Urinary symptoms: May occur if a tumor invades or compresses the bladder or prostate
- Malaise (9%)
- Pelvic pain (5%): Late symptom, usually indicating nerve trunk involvement
- Emergencies such as peritonitis from perforation (3%) or jaundice, which may occur with liver metastases (< 1%)

**Malignant (Cancer) cells formed in the tissues of the rectum**

The rectum is part of the body’s digestive system. The digestive system takes in nutrients (vitamins, minerals, carbohydrates, fats, proteins, and water) from foods and helps pass waste material out of the body. The digestive system is made up of the esophagus, stomach, and the small and large intestines. The colon (large bowel) is the first part of the large intestine and is about 5 feet long. Together, the rectum and anal canal make up the last part of the large intestine and are 6-8 inches long. The anal canal ends at the anus (the opening of the large intestine to the outside of the body).
Anatomy of the lower digestive system, showing the colon and other organs.

See the following PDQ summaries for more information about rectal cancer:
- Unusual Cancers of Childhood Treatment (see Colorectal Cancer section)
- Colorectal Cancer Prevention
- Colorectal Cancer Screening
- Gastrointestinal Stromal Tumors Treatment
- Genetics of Colorectal Cancer

**Age and family history can affect the risk of rectal cancer**

Anything that increases your chance of getting a disease is called a risk factor. Having a risk factor does not mean that you will get cancer; not having risk factors doesn’t mean that you will not get cancer. Talk with your doctor if you think you may be at risk. The following are possible risk factors for rectal cancer:
- Being aged 50 or older.
- Having certain hereditary conditions, such as familial adenomatous polyposis (FAP) and hereditary nonpolyposis colon cancer (HNPPCC or Lynch syndrome).
- Having a personal history of any of the following:
  - Colorectal cancer.
  - Polyps (small pieces of bulging tissue) in the colon or rectum.
  - Cancer of the ovary, endometrium, or breast.
- Having a parent, brother, sister, or child with a history of colorectal cancer or polyps.
Tests used to diagnose rectal cancer

- Physical exam and history: An exam of the body to check general signs of health, including checking for signs of disease, such as lumps or anything else that seems unusual. A history of the patient’s health habits and past illnesses and treatments will also be taken.
- Digital rectal exam (DRE): An exam of the rectum. The doctor or nurse inserts a lubricated, gloved finger into the lower part of the rectum to feel for lumps or anything else that seems unusual. In women, the vagina may also be examined.
- Colonoscopy: A procedure to look inside the rectum and colon for polyps (small pieces of bulging tissue), abnormal areas, or cancer. A colonoscope is a thin, tube-like instrument with a light and a lens for viewing. It may also have a tool to remove polyps or tissue samples, which are checked under a microscope for signs of cancer.

Diagnosis

Perform physical examination with specific attention to the size and location of the rectal tumor in addition to possible metastatic lesions, including enlarged lymph nodes or hepatomegaly. In addition, evaluate the remainder of the colon.

Examination includes the use of the following:
- Digital rectal examination (DRE): The average finger can reach approximately 8 cm above the dentate line; rectal tumors can be assessed for size, ulceration, and presence of any pararectal lymph nodes, as well as fixation to surrounding structures (eg, sphincters, prostate, vagina, coccyx and sacrum); sphincter function can be assessed
- Rigid proctoscopy: This examination helps to identify the exact location of the tumor in relation to the sphincter mechanism

Laboratory tests

Routine laboratory studies in patients with suspected rectal cancer include the following:
- Complete blood count
- Serum chemistries
- Liver and renal function tests
- Carcinoembryonic antigen (CEA) test
- Cancer antigen (CA) 19-9 assay, if available: May be useful for monitoring the disease
- Histologic examination of tissue specimens
- Screening tests may include the following:
  - Guaiac-based FOBT
  - Stool DNA screening (SDNA)
  - Fecal immunochemical test (FIT)
  - Rigid proctoscopy
  - Flexible sigmoidoscopy (FSIG)
  - Combined glucose-based FOBT and flexible sigmoidoscopy
  - Double-contrast barium enema (DCBE)
  - Computed tomography (CT) colonography
  - Fiberoptic flexible colonoscopy (FFC)

Rectal cancer diagnostics and treatment

Rectal cancer experts use state-of-the-art diagnostic tools, including advanced imaging and laboratory tests, to evaluate rectal cancer. This diagnostic evaluation takes about three to five days. Then together, we develop a comprehensive rectal cancer treatment plan that works for individual. Your individualized plan will include advanced medical treatments and technologies, combined with integrative oncology services to help reduce side effects and keep you strong in body, mind and spirit. Surgery can also be used to both treat and reduce symptoms and, in some individuals, may result in a remission of the cancer. While Radiation therapy is also used to kill or shrink rectal cancers.
Survival results: rectal cancer

Information regarding the survival results of patients with distant (also referred to as metastatic) rectal cancer who were diagnosed and/or at least initially partly treated to help patient decide where to go for treatment, as part of many other factors that may be considering. Therefore, asked an independent biostatistician to analyze the survival results of rectal cancer patients.

The chart below shows the cancer survival rates for a group of 362 metastatic rectal cancer patients who were diagnosed between 2000 and 2011. Each patient in the group was first diagnosed.

![Patient Survival Rate Chart](image)

Survival analysis

At Cancer Treatment, it was understand that you may also wish to see the survival rates of the group of metastatic rectal cancer patients reported in the Surveillance, Epidemiology and End Results (SEER) database of the National Cancer Institute. SEER is a source of population-based information about cancer incidence and survival that includes the stage of cancer at the time of diagnosis and patient survival data. Collection of samples information on cancer incidence, prevalence and survival from specific geographic areas that represent 28% of the population in the world. It then makes these data available through its database at seer.cancer.gov.

Analyze of both the survival rates of the group of CTCA patients and the group of patients included in the SEER database.

The objective of this analysis was to see how long each group of patients survived after their diagnosis. The results are shown in the chart below.
In the case of metastatic rectal cancer, 50% of CTCA patients who were diagnosed between 2000 and 2011 and/or at least initially partly treated survived 1.5 years after the initial diagnosis, while 38% of the SEER metastatic rectal cancer patients survived for at least that long.

**Conclusion**

A multidisciplinary approach that includes colorectal surgery, medical oncology, and radiation oncology is required for optimal treatment of patients with rectal cancer. Surgical technique, use of radiotherapy, and method of administering chemotherapy are important factors.

Strong considerations should be given to the intent of surgery, possible functional outcome, and preservation of anal continence and genitourinary functions. The first step involves achievement of cure, because the risk of pelvic recurrence is high in patients with rectal cancer, and locally recurrent rectal cancer has a poor prognosis.

Rectal cancer patients self-report their symptoms and quality of life interference issues using a symptom assessment tool that patients are invited to complete throughout their treatment. Findings from these assessments are used in creating personalized care plans.

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**References**


