Review Article

Review on Diagnosis and Management of Colorectal Carcinoma

Abstract

The current review is about Colorectal Cancer (CRC) which is the third most prevalent malignancy and the fourth most frequent cause of cancer-related death. However, only 1% to 4% of incidences are documented in people between the ages of 25 and 30. A family history of colon or rectal cancer, diet, alcohol consumption, smoking, and inflammatory bowel disease are some risk factors for Colorectal Cancer. Various database including the Medline, Pubmed, Embase, NCBI, and Cochrane databases were searched for studies of patients with non-alcoholic fatty liver disease. Incidence, etiology, and management options were analyzed. It is uncommon for CRC to occur in children, adolescents, or young adults. Although the presenting symptoms are comparable to those in adults, CRC is frequently overlooked in a young patient's initial assessment. According to the results of the researches, surgery is the cornerstone of treatment, and patients who cannot be made disease-free through surgery are rarely cured.

Keywords: *Colorectal carcinoma, Children, Adults, Management guidelines, IBS, Polyps*

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Introduction

Colorectal carcinoma is formed in the colon instead of the rectum, where rectal cancer starts.[1, 2] Colorectal cancer is a term used to describe cancers that affect either of these organs. While not always the case, most colorectal malignancies often arise from adenomatous (precancerous) polyps over time,[3] where after some mutations or abnormalities occur in their cellular DNA, polyps/growths might change. Some risk factors for colorectal cancer are a family history of colon or rectal cancer, diet, alcohol consumption, smoking, and inflammatory bowel disease.[3] Only 1% to 4% of incidences are documented in people between the ages of 25 and 30, and its symptoms are frequently mistaken for those of other illnesses, which then causes considerable delays in diagnosis. Few pediatricians may encounter a case throughout their career due to its low occurrence.[4] However, Colorectal Cancer (CRC) remains the third most prevalent malignancy and the fourth most frequent cause of cancer-related death. The majority of CRC cases are found in Western nations, and the prevalence of the disease is rising. About 4% to 5% of people will acquire colorectal cancer, and factors including age, a history of chronic diseases, and way of life can increase one's risk of getting the disease.[5] Mutations that affect oncogenes, tumor suppressor genes, and genes involved in DNA repair pathways are the root cause of CRC.

Colorectal cancers can be categorized as sporadic (70%), hereditary (5%), or familial (25%), depending on the source of the mutation. There are three different types of pathogenic processes that might cause this, including chromosomal instability (CIN), microsatellite instability (MSI), and the CpG island methylator phenotype (CIMP).[5] In the United States, 142,000 people were diagnosed with CRC in 2010, and 51,000 passed away from the disease.[6] Less than 100 cases, nevertheless, are identified in kids, teenagers, and young adults each year. In wealthy nations, CRC is more prevalent in adults. Although the exact reason for this disparity is unknown, dietary variations have been identified as a critical contributing factor. Obesity, smoking, and alcohol use have also been linked to an increased incidence of CRC in adults.[7] A high-calorie diet, excessive red meat eating or cooking, excessive alcohol use, sedentary behavior, and cigarette smoking.[8] Thus, the disparity between industrialized and underdeveloped nations is more likely to result from intricate

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interactions between several variables, including genetics, lifestyle, environment, and diet.[9] Most CRC cases in adults occur sporadically, but 20% to 30% may have a hereditary component.[10] Only 5% of individuals have a well-established hereditary genetic condition. Hereditary nonpolyposis CRC or Lynch syndrome is the most prevalent of these (3% to 5% of all cases).

Materials and Methods

PubMed database was used for article selection, and the following keys were used in the Mesh (("Colorectal Carcinoma " [Mesh]) AND ("signs and symptoms" [Mesh]) OR ("Management" [Mesh])).

In regards to the inclusion criteria, the articles were selected based on the inclusion of one of the following topics: Colorectal Carcinoma

Colorectal Carcinoma features and management. Exclusion criteria were all other articles that did not have one of these topics as their primary endpoint.

Around 90 publications were chosen as the most clinically relevant out of 1,202 articles indexed in the previous two decades, and their full texts were evaluated. A total of 31 of the 90 were included after a thorough examination. Additional research and publications were found using reference lists from the recognized and linked studies. Expert consensus recommendations and commentary were added where relevant to help practicing physicians assess Colorectal Carcinoma most simply and practically possible.

Epidemiology

One to two million new cases of Colorectal Cancer (CRC) are identified each year, making it one of the most prevalent malignancies in the world. With 700,000 cancer-related deaths yearly, colorectal cancer ranks fourth among all cancers, behind only lung, liver, and stomach cancers. According to gender, CRC is the second most prevalent cancer in women (9.2%) and the third most prevalent in men (10%).[11] From 1990 to 2012, there were over 200,000 additional new cases of CRC annually. Most CRC cases (55%) are found in Western nations; however, this trend is shifting due to several nations' recent rapid development.[12] Even so, due to advancements in healthcare systems and the deployment of screening programs, only 33% of CRC-related fatalities worldwide occurred in Western nations in 2010. But with 134,490 new cases and 49,190 deaths anticipated from colorectal cancer in 2016, the outlook is anything but optimistic.[12]

Risk factors

About 4%–5% of individuals globally will get colorectal cancer. Numerous character traits or behaviors are also regarded as risk factors since they raise the possibility of acquiring polyps or colon cancer, such as age: age is the critical risk factor for colorectal cancer, and from the fifth decade of life, the risk of getting CRC increases significantly. Indeed, colorectal cancer rarely develops before the age of fifty (apart from inherited malignancies).[13]

There are also more intrinsic risk factors besides age that cannot be changed, such as a personal history of colorectal cancer or inflammatory bowel disease (IBD). Indeed, the risk is elevated by 3.7% in patients with ulcerative colitis[14] and by 2.5% in patients with Crohn's disease,[15] which are significant risk factors for colorectal cancer development. Indeed, IBD-related chronic inflammation frequently results in dysplasia, an abnormal cell development. Despite not yet being cancerous, dysplastic cells are more likely to become anaplastic and grow into tumors.

Another risk factor that might be added to this group is the existence of relatives with a positive family history of CRC, particularly those younger than fifty at the time of diagnosis. Indeed, inherited mutations or environmental factors can contribute to an elevated risk due to family history.[16] By making little changes to one's eating and exercise routines, one can lower several other risk factorstied to lifestyle. For instance, although the link between a sedentary lifestyle and colorectal cancer is not fully understood, it is believed that it can raise the risk of the disease. However, it has been demonstrated that light exercise boosts metabolic rates and gastrointestinal motility and, over time, boosts metabolic efficiency and lowers blood pressure.[17]

Additionally, it has been demonstrated that drinking alcohol and smoking raise the risk of CRC. Acetaldehyde, the primary metabolite of ethanol, has been referred to as a carcinogen in the context of alcohol usage because it increases the risk of colon cancer in people with polymorphisms in the enzymes responsible for alcohol metabolism.[18] But the connection between drinking alcohol and CRC is still not well understood.

Signs and symptoms

Certain colorectal tumors may exist without showing any symptoms. For early identification of issues, it is crucial to conduct routine colorectal screenings (examinations), the most effective of which is a colonoscopy. Fecal occult blood tests, fecal DNA tests, flexible sigmoidoscopy, barium enema, and CT colonography are additional screening methods (virtual colonoscopy). The risk factors of the individual, particularly a family history of colon and rectal cancers, will determine when such screening tests start and at what age.[19]

The following are typical indications of colorectal cancer:

- **Changes in bowel habits:** although bowel incontinence, constipation, diarrhea, narrowing of stools, incomplete evacuation, and other symptoms are typically signs of other less severe conditions, colon cancer can also present with these symptoms.
- **Blood on or in the stool** is one of the most apparent symptoms of colorectal cancer and a warning signal. However, since many other conditions, such as hemorrhoids, anal tears (fissures), ulcerative colitis, and Crohn's disease, to mention a few, can also cause digestive tract bleeding, it is not always a sign of cancer. Additionally, iron and other foods, like beets, can make the stool seem black or red, deceiving the user into thinking there is blood in the stool.[19]
- **Unexplained anemia:** anemia is a deficiency of red blood cells, which are responsible for transporting oxygen throughout the body. Breathlessness is one of the symptoms of anemia. Additionally, you can feel so worn out and lethargic that even sleeping won't make you feel better.
- **Bloating or pain in the pelvis or abdomen**
- **Unaccounted-for weight loss**
- **Vomiting**

Diagnosis

Tissue must be examined histopathologically for a diagnosis. The preferred method for deciding on the tissue collection technique is consulting with surgical colleagues and relying on the patient's clinical state. Surgery is the most crucial element of successful treatment. Thus, this should be considered when deciding how tissue will be collected. A chest x-ray, chest, abdomen, pelvic CT scan, and bone scan should be part of a thorough evaluation of a patient with suspected CRC. Before a diagnosis is made, a barium enema can occasionally be done to help detect problem regions.

Fluorodeoxyglucose positron emission tomography (FDG-PET) scans' efficacy is currently unknown. This approach seems less effective at identifying lesions with mucinous histology.[20] Children seem to have a higher prevalence of mucinous lesions. Hence FDG-PET scans may not be as beneficial in these patients. A thorough colonoscopy to search for other lesions or polyps, a blood chemistry panel with liver enzymes, and often a Carcinoembryonic Antigen (CEA) assay are additional tests to take into account. Although this antigen can be used to track disease development and predict recurrence in adults, it is less likely to be helpful in most pediatric patients.[21]

Treatment

The recommendations that physicians generally make for children and adolescents are adapted from the experience in adults.

Surgery

The mainstay of treatment, surgery, should be radical, as it is impossible without a complete surgical excision. Surgery might potentially be curative in cases with resectable liver or lung metastases. For anastomotic recurrence prevention, the resection margins must be less than 5 cm of the normal intestine,[22] and the disease stage should be determined by examining at least 12 negative lymph nodes. The renal fascia and the diaphragm should all be inspected on the peritoneal surface. Resection of all peritoneal lymph nodes is recommended. A revision surgical exploration to evaluate margins and do the required lymph node inspection is suggested if surgery is oncologically inappropriate.[23] Also, CRC is rarely the first suspected diagnosis in children.

Chemotherapy

The initial stage determines the need for adjuvant therapy, and adult patient criteria are used in this instance.[22] Surgery alone can increase a patient's chance of survival to 90% at five years, and close monitoring is advised rather than adjuvant treatment. Adjuvant chemotherapy's function in stage II patients is unclear, and it doesn't seem to increase overall survival by more than 5%. However, adjuvant chemotherapy should be considered for children and adolescents because most of those with stage II of the illness exhibit adverse prognostic characteristics. Chemotherapy is beneficial in stage III-IV instances (nodal involvement or metastases).[22]

Targeted therapies

Some patients, primarily those with later stages of the disease, have shown that targeted therapy is beneficial (III-IV). Bevacizumab, pembrolizumab, cetuximab, panitumumab, bortezomib, and gefitinib are the most explored therapeutics for CRC.[22]

Radiotherapy

When used in conjunction with chemotherapy and 5-FU, radiation can only be used post-surgery in patients with rectal cancer. Before surgery in severe cases (stage T4, local perforation, or obstruction), radiation may be utilized to lower the risk of recurrence or enable less invasive surgical techniques.[22]

Conclusion

It is uncommon for CRC in kids, teenagers, or young adults. Although the presenting symptoms are comparable to those in adults, CRC is frequently overlooked in a young patient's initial assessment. Few pediatric oncologists have significant expertise with CRC due to its rarity in children, and clinical studies are seldom available. Most reported cases present with advanced-stage disease and have mucinous or signet-ring cell carcinomas, whereas only 5% to 15% of adults present with these histologic subtypes.[24] Therefore, adult treatment recommendations should be modified for young patients.

Surgery is the cornerstone of treatment, and patients who cannot be made disease-free through surgery are rarely cured. Adult CRC treatment is developing quickly.[24] Therefore, speaking with medical oncologists who have experience treating adults with CRC is critical.

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Conflict of interest
None.

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Ethics statement
None.

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