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A Review Article on Colorectal Cancer

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ABSTRACT

The main aim of this study is to give a descriptive explanation about Colorectal Cancer i.e. Colon or Rectum Cancer, its risk factors, its material and methods, factors that cause colorectal cancer, diagnosis, treatment etc. in India and World. Brief description about Cancer and its types are also given. Colorectal cancer is common in both males as well as females in the world. Colorectal cancer is rising in the world at different rates. Worldwide, colorectal cancer is ranked third in terms of incidence after breast cancer. It has been estimated that worldwide 1.8 million cases are diagnosed in 2018 as per the survey of WHO and in India, it is approximately 7.2 per 100,000 in males and 5.1 per 100,000 in females. Colorectal cancer has become one of the major cancers worldwide due to lifestyle of peoples and sometimes also found in children's aged 12-20 years.



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INTRODUCTION

Basically abnormal growth of that occurs in colon or rectum is known as Colorectal Cancer [CRC]. Colorectal cancer begins as polyp which develops on inner lining of rectum/colon and it grows slowly. Colon cancer is likely to spread to liver, but also can spread to other places like peritoneum (lining of abdominal cavity), lungs, brain or lymph nodes. Colorectal cancer is typically detected either during a colonoscopy or X-ray or CT-scan before symptoms starts developing. All types of cancer are major cause of mortality and morbidity in developing and developed countries like America, Africa, Asian countries etc.

According to American cancer society, they states that 147,950 people will be diagnosed with colorectal cancer and 53,200 could die from the disease in 2020. The increase in incidence may be due to smoking, family history, lifestyle, obesity, bowel disorder. In mid 1980s Colorectal cancer survival rate has been increased due to increase in awareness and screening programs. Basically, by finding of polyps in earlier stages it is easy to treat colorectal cancer.

WHAT IS CANCER?

We all are most probably familiar with the word 'Cancer'. Cancer is the uncontrollable growth of unwanted cells which may result in tumors, damage to immune system or maybe fatal to human life. Cancer is one of the common diseases in developing and developed countries. Body of any living organism is made up of billions of cells when these cells starts get damaging, they all start growing in abnormal ways.

A caution that tells us about our changing habits and may lead to cancer:-

C – Change in bowel process, urination

A – A sore that is unable to heal.

U – Unusual blood from private parts (women's)

T – Thickening occurrence in breast, neck etc.

I – Indigestion

O – Observed weight loss

N – Nagging cough

COLON CANCER AND POLYP

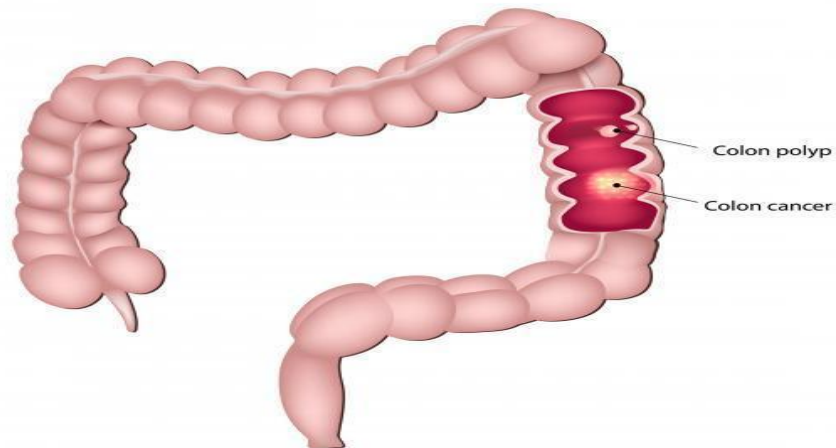


Figure No. 1: Colorectal Cancer

Cancer may be grouped according to type of cell they start in. There are 6 main types. They are:-

- Carcinoma: - malignant neoplasm of epithelial cells or cancer of internal or external lining of body. Its subtypes are adenocarcinoma, basal cell carcinoma and squamous cell carcinoma.
- Sarcoma: - originates in connective tissues such as tendons, muscles, cartilages, bones and fat.
- Myeloma: - cancer of plasma cell of bone marrow.
- Leukemia: - blood cancer which makes overproduction of WBC.
- Lymphoma: - originates in glands and nodes of lymphatic system. This may also occur in some specific organs such as stomach, breast or brain.
- Mixed type: - components may be of same or different category.

Example: - mixed mesodermal tumor

Cancer is mainly of two types:-

- Benign: - tumor does not contain cancerous cells and do not spread into its surrounding.

- Malignant: - tumor contains cancerous cells and also effect nearly surrounding cells.

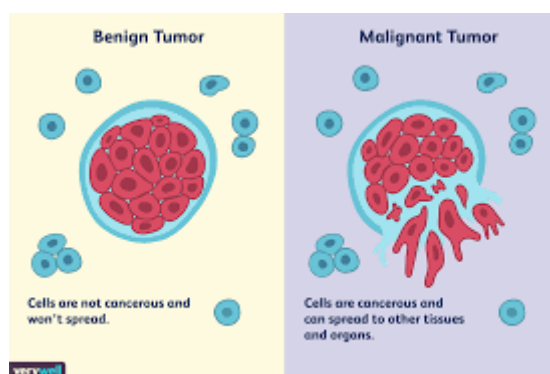


Figure No. 2: Benign and Malignant tumor

MATERIALS AND METHODS

Colorectal cancer basically develops in cells of living inside the large intestine. Adenocarcinoma of colon/ rectum typically starts growing tissue called a 'polyp' i.e. called an adenoma which may develop cancer. Colorectal cancer may grow in four types:-

- 1) In situ: - cancer which has not yet invade wall of colon or rectum.
- 2) Local: - cancer which has grown in wall of colon or rectum but do not invade near tissues.
- 3) Regional: - cancer which has spread through wall of colon and also invades tissues and nearby lymph nodes.
- 4) Distant: - cancer which also spread to other body parts such as liver or lung.

Colorectal cancer begins in different areas like liver or lungs and also affects tissues and lymph nodes. Different types of colorectal cancer may be:-

- GIST (gastrointestinal stromal tumors)
- Carcinoids
- Lymphoma
- Adenocarcinoma
- Turcot syndrome

- PJS (peutz-jeghers syndrome)
- Juvenile polyposis coli



Figure No. 3: types of colorectal cancer

HISTORY OF COLORECTAL CANCER

In 460 B.C., Hippocrates (known as father of medicines) told that human body is made up four senses of humor i.e. blood, yellow bile, phlegm and black bile. He also told that cancer occurs due to excess of black bile.

In 2nd century AD, Greek physician Galen used word ‘oncos’ to tell about tumors, due to his support we derived term ‘oncology’. First cause of cancer was identified by British surgeon Pereivall pott, he discovered cancer of scrotum in 1775. William colely in late 19th century observed that cure after surgery is higher before asepsis. Dr. Aldred Warthin, first suspected disorder in family of women who died of endometrial cancer over 100 years ago. In 1971, updated study by Lynch and Krush showed it consonant which became to be known as ‘Lynch syndrome’. Lynch syndrome (HNPCC or hereditary nonpolyposis colon cancer) is caused due to changes in genes that help to repair damaged DNA.

DNA repair enzyme genes like MLH1, MLH3, MSH6, PMS1 and PMS2.

STAGES OF COLORECTAL CANCER

Stages of colorectal cancer is from 0 – 5.

Staging of colorectal cancer is also based on TNM system:-

T – Tumor

N – Node

M – Metastasis

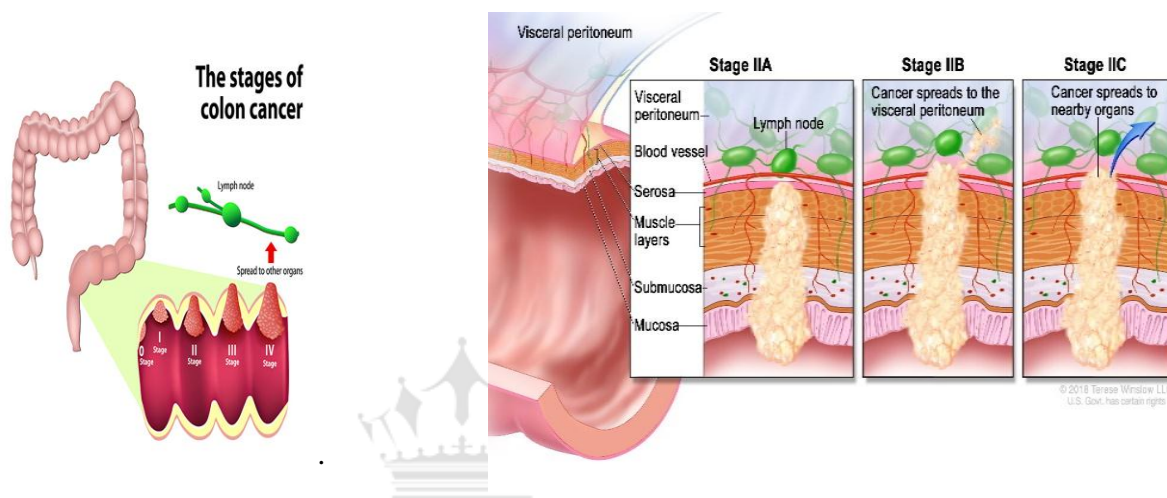


Figure No. 4(a): stages of colon cancer **Figure No. 4(b): stages of rectal cancer**

- I. STAGE 0: Cancer in situ, cancer cells are only in mucosa of colon/ rectum.
- II. STAGE I grow through mucosa and invade muscular layer of colon/ rectum.
- III. STAGE II: it is subdivided into three stages; stage IIA, stage IIB and stage IIC.
 - ✓ STAGE IIA: grow to walls of colon/ rectum but don't spread to nearby tissues or lymph nodes.
 - ✓ STAGE IIB: cancer grows to muscle lining of abdomen but do not spread to lymph nodes.
 - ✓ STAGE IIC: tumor spread into colon and rectum wall and also to nearby structures but do not spread to lymph nodes.
- IV. STAGE III: this stage is subdivided into three stages; stage IIIA, stage IIIB, stage IIIC.

- ✓ STAGE IIIA: cancer grows to inner lining of intestine. Spread to nodule in tissues but not appear to lymph nodes and do not spread to other parts of body.
 - ✓ STAGE IIIB: cancer grow through bowel wall and to nodules in tissues that do not spread to other body parts.
 - ✓ STAGE IIIC: spread to four or more lymph nodes but not other body parts.
- V. STAGE IV: stage IV is subdivided three stages; stage IVA, stage IVB, stage IVC.
- ✓ STAGE IVA: cancer spread to single distant body part either liver or lung.
 - ✓ STAGE IVB: cancer spread to more than one body part.
 - ✓ STAGE IVC: cancer spreads to peritoneum and also to other body organs.

SYMPTOMS OF COLORECTAL CANCER

The very first sign of colorectal cancer is growth of polyp inside inner lining of colon and its major part of digestive tract.

Some main symptoms seen during colorectal cancer are:-

- ❖ Bowel does not completely get clear.
- ❖ Bleeding of rectal or blood in stools.
- ❖ Change in bowel habits, including constipation.
- ❖ Fatigue.
- ❖ Weight loss.
- ❖ Weakness.
- ❖ Size of organ may vary.
- ❖ Sometimes no symptoms during early stages.



Figure No. 5: symptoms of colorectal cancer

EPIDEMIOLOGY

In United States, colorectal cancer is in third number of all the cancers.

In 2016 it is 134,490 new colorectal cancer cases (70,820 in males and 63,670 in females) along with 49,190 colorectal deaths (26,020 in males and 23,170 in females).

Uses of colonoscopy help in early detection for removal of precancerous lesions. In recent years use of colonoscopy has increased from 19.1 % to 54 % in 2013.

Several genes are related to mutations such as APC, DCC, AKT, TP53, and BRAF.

RISK FACTORS OF COLORECTAL CANCER

4.6% of men (1 in 22) and 4.2% women (1 in 24) are diagnosed with colorectal cancer for lifetime.

Some major risk factors of colorectal cancer are as follows:-

- **Age:** colorectal cancer risk increases with increase in age. Diagnosis of colon cancer is 68 age in mens and 72 in women's. For rectal cancer is 63 for both sexes.
- **Sex:** 30% higher risk of colorectal cancer in men's than in women's.
- **Heredity:** people whose parents, siblings, children's are diagnosed with colorectal cancer have two to four times more risk of developing colorectal cancer.
- **Diabetes:** persons who have type II diabetes have an increased risk of colorectal cancer.

- **Obesity:** persons who are usually obese either male or female are more prone to colorectal cancer. Obese men have 50% higher risk of colon cancer and 20% risk of rectal cancer.
- **Smoking:** International agency for research on cancer reported tobacco smoking causes colorectal cancer.
- **Alcohol:** Moderate and heavy alcohol use have increased risk of colorectal cancer.
- **NSAID's:** extensive use of aspirin or other NSAIDs lowers risk of the colorectal cancer sometimes.
- **Hormones:** postmenopausal hormone use and colorectal cancer is not same throughout because use of wrong hormone pills may also lead to colorectal cancer.

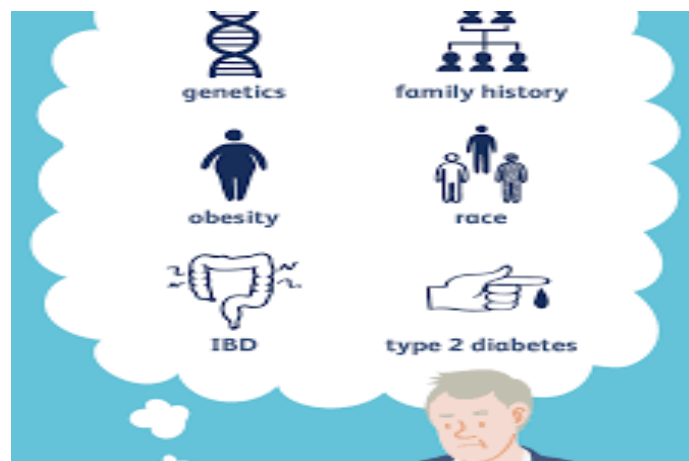


Figure No. 6: Risk factors of colorectal cancer

DEATH DUE TO COLORECTAL CANCER GLOBALLY

There are almost 1.8 million cases in 2018.

The countries with top 11 highest colorectal cancer cases –

RANK	COUNTRY	AGE STANDARDISED RATE PER 100,000
1.	Hungary	51.2
2.	South Korea	44.5
3.	Slovakia	43.8
4.	Norway	42.9
5.	Slovenia	41.1
6.	Denmark	41.0
7.	Portugal	40.0
8.	Barbados	38.9
9.	Japan	38.9
10.	Netherlands	37.8
11.	Australia	36.9

TREATMENTS FOR COLORECTAL CANCER

The stage 0 cancer can probably be treated by removal cancer cells by colonoscopy. But for I, II and III stage cancer it is compulsory to perform surgery using radical colostomy of segment involving margin >5 cm.

1. COLON CANCER:-

- Carcinoma in situ: - Cancer has not spread beyond layer of cells in which it has began. Surgery is done to remove growth of abnormal cells by 'polypectomy' (polyp removal).
- Localized stage: - Cancer which has penetrated wall of colon. Colon from either sides of tumor is removed.
- Regional stage: - It includes cancer which has grown through wall of colon and spread near lymph nodes. 5 – Fluorouracil is used in patient with stage III cancer.
- Distant stage: - When surgery is performed it helps in prevention of blockage of colon.

2. RECTAL CANCER

- Carcinoma in situ:- Resection is performed through anus. It includes treatment like polypectomy, full rectal resection.
- Localized stage:- Treated by removal through anus without abdominal incision. In this removal of anus and sphincter muscle is done.
- Regional stage: - Chemotherapy is done and also chemoradiation is performed.
- Distant stage:- Surgery is usually performed.

3. COLOSTOMY:- Cancerous part is removed and healthy parts are connected helping patient to eliminate waste normally.

4. CHEMOTHERAPY:- 5 – fluorouracil, oxaliplatin are the most common drugs used in chemotherapy.

5. TARGETED THERAPY: - mainly targeted therapy target specific molecules used in tumor growth.

RESULT AND DISCUSSION



Nowadays colorectal cancer has become one of the most common cancer in both sexes (male and female) in developed as well as developing countries. This may be due to many factors like physical, chemical or genetic or maybe high doses of unwanted medicines.

Many of the treatments are available for treating colorectal cancer but cure only up to stage 0 – III colorectal cancer but in some cases, polyps tend to grow again and sometimes it is also very difficult to treat once they start spreading to other body parts.

CONCLUSION

In this article, we have done descriptive study of COLORECTAL CANCER and its history, risk factors, epidemiology, death due to colorectal cancer globally, treatment which we have studied in various research and review articles that are published in national and international journal.

Usually, colorectal cancer occurs due to several lifestyle processes like smoking, alcohol consumption etc.

Unusual dosage of any type of medicines should be avoided and body weight should also be maintained because overweight person are at higher risk of colorectal cancer than those who have proper lifestyle.

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