

COLORECTAL CANCER IN BANGLADESH; INCIDENCE, FACTORS AND MANAGEMENT

A research paper is submitted to the Department of Pharmacy, East West University is conformity with the requirements for the degree of Bachelor of Pharmacy.

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*This research paper is dedicated to my
Parents and Brother*

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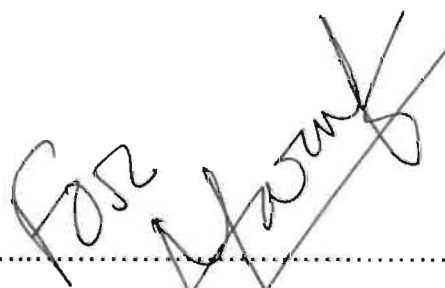
I would like to express my thanks to the authority of East West University for their heartfelt help in my project work.

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CERTIFICATE

This is to certify that the thesis “Colorectal cancer in Bangladesh; Incidence, factors and management” is submitted to the department of Pharmacy, East West University, Mohakhali, Dhaka in partial fulfillment of the requirements for the degree of bachelor of Pharmacy (B. Pharm.) was carried out by Tanhar Islam (ID: 2006-2-70-018) under my guidance and supervision and that no part of the thesis has been submitted for any other degree. I further certify that all the sources of information and laboratory facilities availed of this connection is duly acknowledged.



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ABSTRACT

Colorectal Cancer is one of the most rapidly emerging illnesses in our country and associated with significant morbidity and mortality. In Bangladesh, Colorectal Cancer is an important cause of increasing mortality rate among the adult patients in Bangladesh. In our study of 40 patients, 68% patients were male and 32% patients were female. We observed that 27.5% patients were in age range between 51 and 60 years and 25% patients were between 31 and 40 years of age. A greater prevalence of was observed in male patients rather than in female patients. Among the male and female patients 47% patients are from rural areas and the most frequent risk factors found was Diet having low fruit and vegetable content followed by Polyp in Colon and rectum. We also found that Bloody stool made the main symptom of Colorectal Cancer. We found a variety of treatment pattern to treat the colorectal cancer patients such as Surgery (52.5%), Chemotherapy (40%) and Palliative Chemotherapy for the patients (with Stage-IV Colorectal cancer). Among the Chemotherapeutic agents Oxalitin and Leukovarine were frequently used and percentages for the both drugs were 57.5% and 47.5 respectively. During the treatment period, weakness and Alopecia were found to be the prime side effects having percentage 52.5% and 45% respectively. Among the 40 cases we studied, 25% cases were found to be recurrent.

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List of abbreviations:

BSMMU	Bangabandhu Sheikh Mujib Medical University
CEA	Blood tests carcinoembryonic antigen
<i>CT scan</i>	Computerised tomography
DNA	Deoxyribonucleic acid
DRE	Digital rectal examination
FAP	Familial adenomatous polyposis
FOBT	Fecal occult blood test
HNPCC	Hereditary nonpolyposis colon cancer
IORT	Intra-operative radiation therapy
<i>MRI</i>	Magnetic Resonance Imaging
NICRH	National Institute of Cancer Research & Hospital
PET	Positron emission tomography
RBC	Red blood cell
SGPT	Serum glutamic pyruvic transaminase
WBC	White blood cell
WHO	World Health Organization



CHAPTER-01: INTRODUCTION

1. Introduction

1.1. Cancer

Cancer is a disease in which abnormal cells divide without control and are able to invade other tissues. There are over 100 different types of cancer, and each is classified by the type of cell that is initially affected. Cancer harms the body when damaged cells divide uncontrollably to form lumps or masses of tissue called tumors, except in the case of leukemia where cancer prohibits normal blood function by abnormal cell division in the blood stream. Tumors can grow and interfere with the digestive, nervous, and circulatory systems and they can release hormones that alter body function. Tumors that stay in one spot and demonstrate limited growth are generally considered to be benign.

Cancer is undoubtedly a serious and potentially life-threatening illness. For example, it is the leading cause of death in Americans under the age of 85, and the second leading cause of death in older Americans. There will be 1.5 million new cases of cancer occurring in the United States coming year, and over 570,000 deaths because of it not including basal and squamous skin cancers which are not reported but could add another two million cases per year ^[1].

1.2. How Cancer forms?

In our body, basically two types of tumors are seen. These are Benign Tumor and Malignant Tumor. Between these, Malignant Tumor is responsible for Cancer. Malignant tumors have three distinctive properties which differentiate them from the normal “Benign” tumors. These properties are-

1. “Malignant” tumors must have uncontrollable growth.
2. They must be Invasive, which means it should be intrusive or destructive to the adjacent tissues.
3. And should have Metastatic property, which means can spread over other part of the body via Lymph node or Blood.

Malignant tumors form by following ways:

1. a cancerous cell manages to move throughout the body using the blood or lymph systems, destroying healthy tissue in a process called invasion
2. that cell manages to divide and grow, making new blood vessels to feed itself in a process called angiogenesis. ^[2]

Due to the effect of carcinogens like Tobacco smoke, radiation, chemicals, or infectious agents abnormalities of the Genetic material may be occurred leading to the formation of Malignant tumor. Errors in DNA replication, Interaction between carcinogen and Host's genome etc also result Cancer. ^[3]

Two types of Genes are responsible for the malfunction of the cell during Cancer. "Cancer-promoting Oncogenes" give the cells new property such as hyperactive growth and division, protection against programmed cell death, loss of respect for normal tissue boundaries, and the ability to become established in diverse tissue environments. "Tumor suppressor genes" are then inactivated in cancer cells, resulting in the loss of normal functions in those cells, such as accurate DNA replication etc. ^[3]

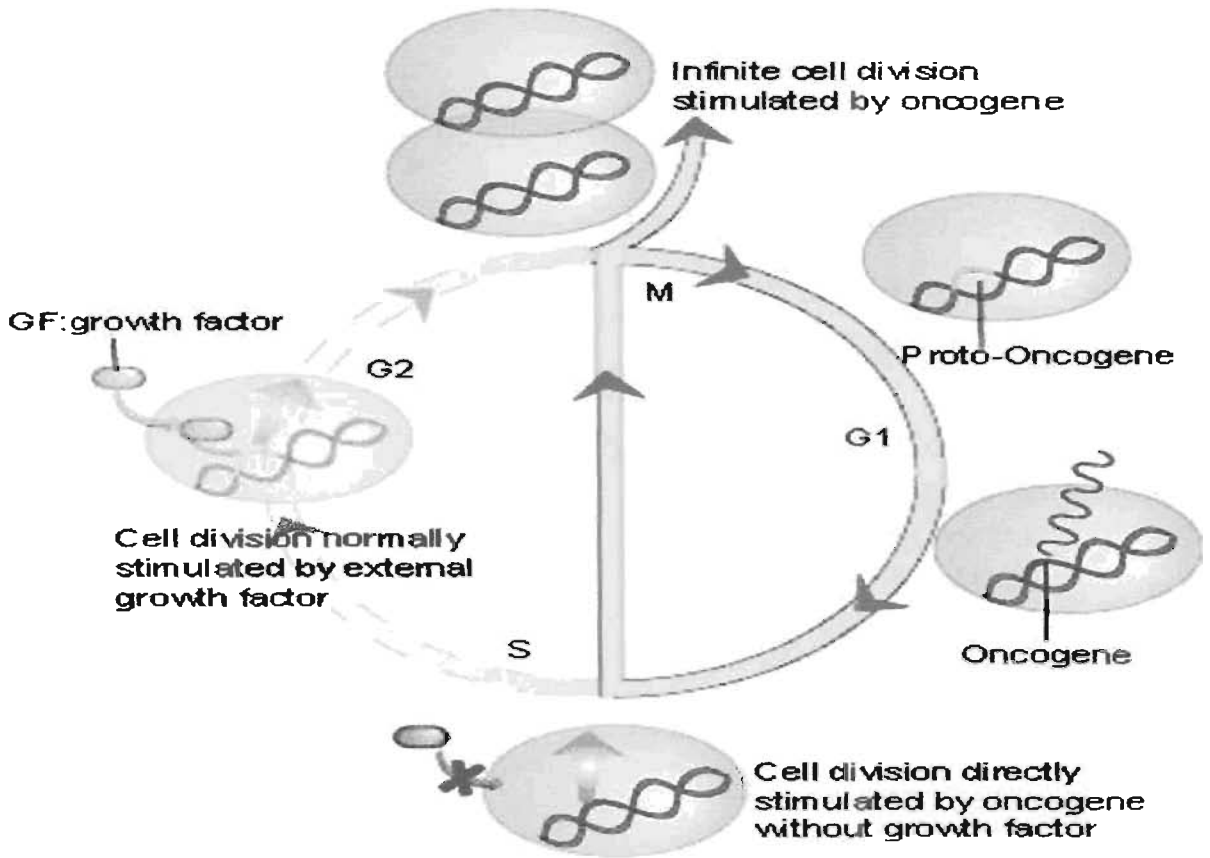


Figure 1.1 Initiation of Cancer by Oncogenes. Here Cells loose control over there normal function by the activation of these Oncogenes.

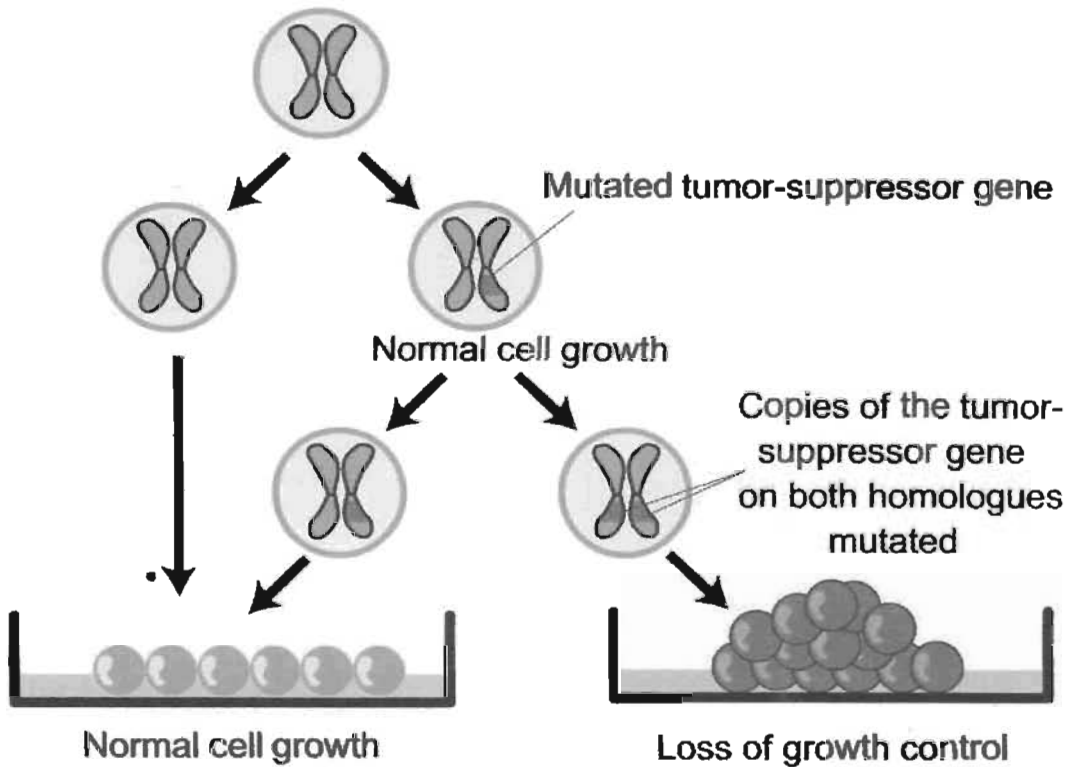


Figure 1.2 Initiation of Cancer by Tumor Suppressor Genes

1.3. Types of Cancer

Cancer can be classified as follows:

1. **Carcinoma:** Malignant tumors derived from epithelial cells. This group represents the most common cancers, including the common forms of breast, prostate, lung and colon cancer.
2. **Sarcoma:** Malignant tumors derived from connective tissue, or mesenchymal cells.
3. **Lymphoma or Leukemia:** Malignancies derived from hematopoietic (blood-forming) cells.
4. **Central Nervous System cancer:** cancers that begin in the tissues of the brain and spinal cord.

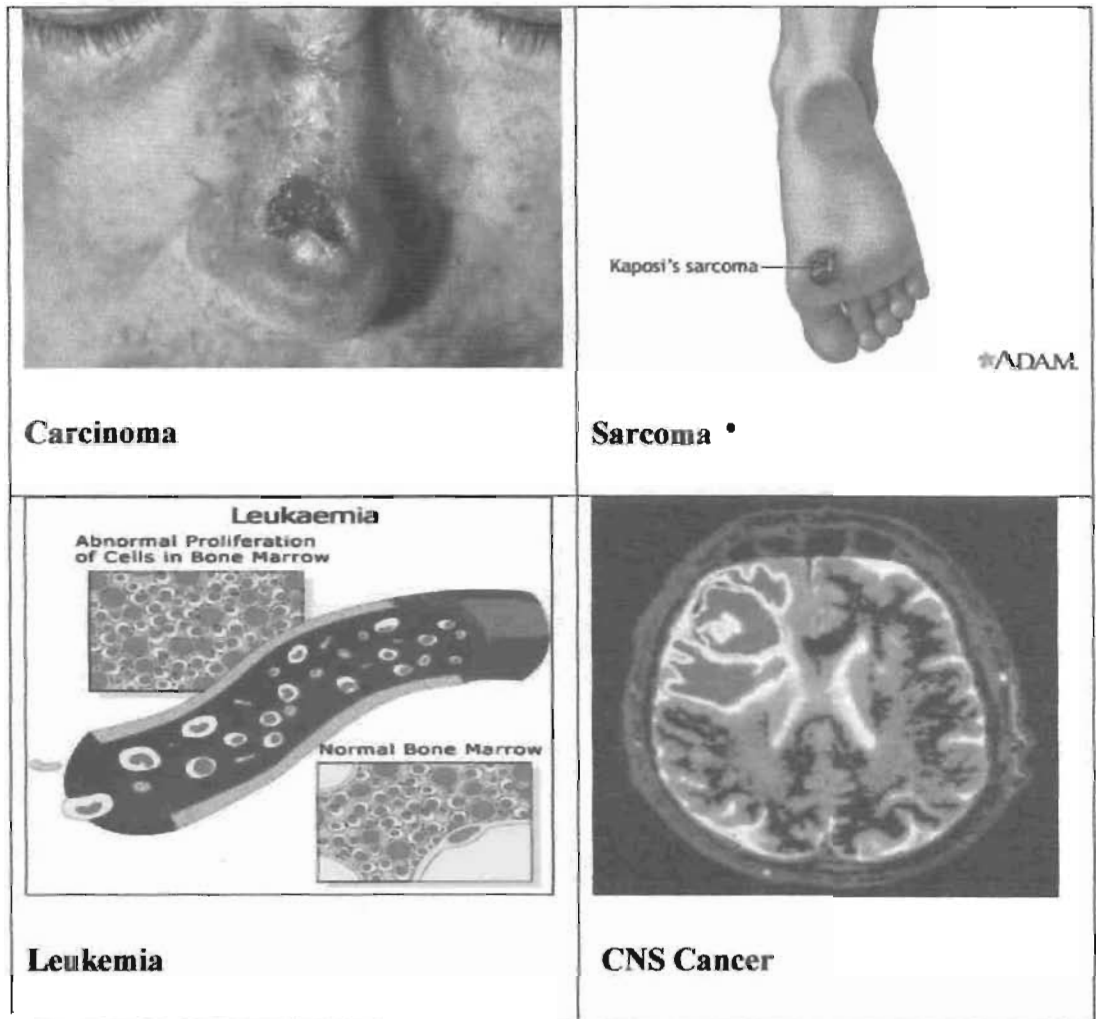


Figure 1.3 Different Types of Cancer

Besides that, there are other cancer forms such as ^[4]:

- **Germ cell tumor:** Tumors derived from totipotent cells. In adults most often found in the testicle and ovary; in fetuses, babies, and young children most often found on the body midline, particularly at the tip of the tailbone; in horses most often found at the poll (base of the skull).
- **Blastic tumor or blastoma:** A tumor (usually malignant) which resembles an immature or embryonic tissue. Many of these tumors are most common in children.

Malignant tumors (cancers) are usually named using -carcinoma, -sarcoma or -blastoma as a suffix, with the latin or greek word for the organ of origin as the root. For instance, a cancer

of the liver is called “Hepatocarcinoma”; a cancer of the fat cells is called “Liposarcoma”. For common cancers, the English organ name is used. For instance, the most common type of breast cancer is called “Ductal carcinoma” of the breast or “Mammary Ductal Carcinoma”. Here, the adjective ductal refers to the appearance of the cancer under the microscope, resembling normal breast ducts.

Benign tumors are named using -oma as a suffix with the organ name as the root. For instance, a benign tumor of the smooth muscle of the uterus is called leiomyoma. It is commonly Fibroid. Unfortunately, some cancers also use the -oma suffix, examples being melanoma and seminoma.

1.4. Epidemiology of Cancer:

In 2004, 13% of all deaths (7.4 million) in the world were due to cancer. The leading causes were: ^[5]

- Lung (1.3 million deaths/year)
- Stomach (803,000 deaths)
- Colorectal (639,000 deaths)
- Liver (610,000 deaths)
- Breast (519,000 deaths)

More than 70% of all cancer deaths occurred in low- and middle-income countries. Deaths from cancer worldwide are projected to continue rising, with an estimated 11.5 million deaths in 2030.

Another data shows that the number of cancer related death cases are more in the middle Asia and southern america.(Figure:1.4) ^[6]

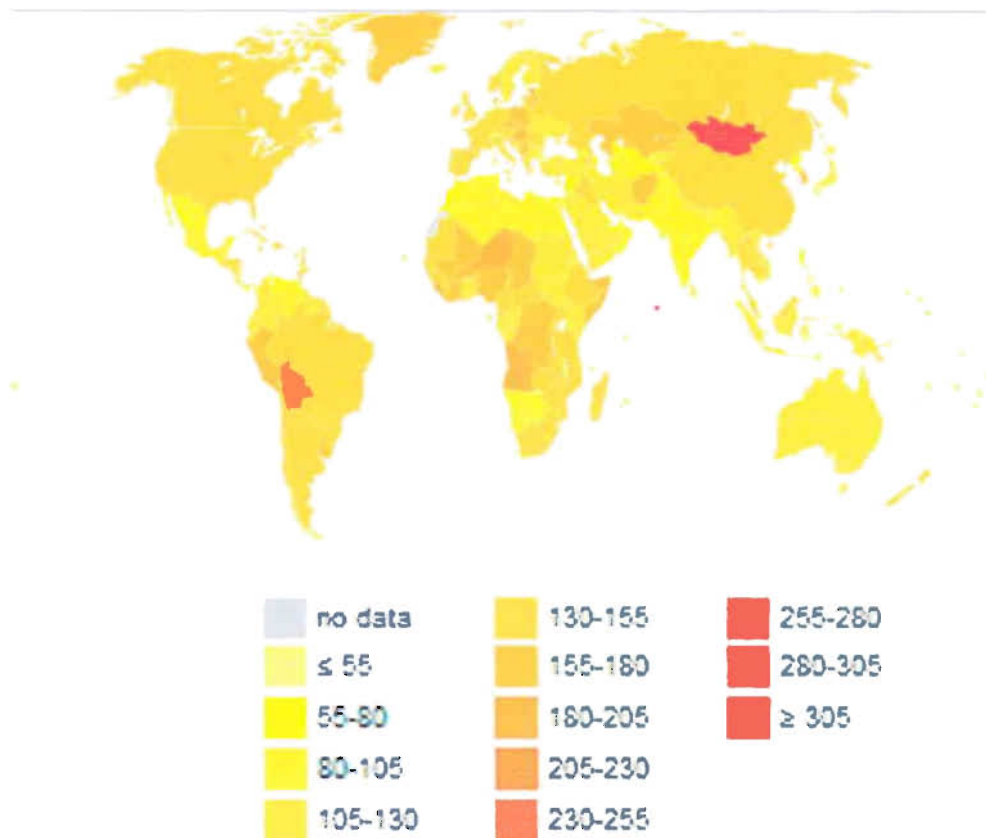


Figure 1.4 Death rate from malignant cancer per 100,000 inhabitants in 2004

In the developed world, one in three people will develop cancer during their lifetimes. ^[7] If all cancer patients survived and cancer occurred randomly, the lifetime odds of developing a second primary cancer would be one in nine. However, cancer survivors have an increased risk of developing a second primary cancer, and the odds are about two in nine. About half of these second primaries can be attributed to the normal one-in-nine risk associated with random chance. The increased risk is believed to be primarily due to the same risk factors that produced the first cancer and partly due, to the treatment for the first cancer, which typically includes mutagenic chemotherapeutic drugs or radiation. Cancer survivors may also be more likely to comply with recommended screening, and thus may be more likely than average to detect cancers. ^[7]

The most common cancer in male and female by occurrence and by mortality rate is as follows ^[8]:

Table 1.1- Estimated New Cases of Colorectal Cancer:

Male			Female		
Cancer Type	Cases	Percentage	Cancer Type	Cases	Percentage
Prostate	186320	25%	Breast	182460	26%
Lung and Bronchus	114690	15%	Lung and Bronchus	100330	14%
Colon and Rectum	77250	10%	Colon and Rectum	71560	10%
Urinary Bladder	51230	7%	Uterine Corpus	40100	6%
Non-Hodgkin Lymphoma	35450	5%	Non-Hodgkin Lymphoma	30670	4%
Melanoma of the Skin	34950	5%	Thyroid	28410	4%
Kidney and Renal Pelvis	33130	4%	Melanoma of the Skin	27530	4%
Oral Cavity and Pharynx	25310	3%	Ovary	21650	3%
Leukemia	25180	3%	Kidney and Renal Pelvis	21260	3%
Pancreas	18770	3%	Leukemia	19090	3%
All sites	745180	100%	All sites	692000	100%

Table 1.2- Estimated Deaths due to Colorectal Cancer

Male			Female		
Cancer Type	Cases	Percentage	Cancer Type	Cases	Percentage
Lung and Bronchus	90810	31%	Lung and Bronchus	71030	26%
Prostate	28660	10%	Breast	40480	15%
Colon and Rectum	24260	8%	Colon and Rectum	25700	9%
Pancreas	17500	6%	Pancreas	16790	6%
Liver and Intrahepatic Bile Duct	12570	4%	Ovary	15520	6%
Leukemia	12460	4%	Non-Hodgkin Lymphoma	9370	3%
Esophagus	11250	4%	Leukemia	9250	3%
Urinary Bladder	9950	3%	Uterine Corpus	7470	3%
Non-Hodgkin Lymphoma	9790	3%	Liver and Intrahepatic bile Duct	5840	2%
Kidney and Pelvis	8100	3%	Brain and Other Nervous System	5650	2%
All Sites	294120	100%	All Sites	271530	100%

1.5 Prevalence of cancer in Bangladesh:

According to WHO, there are 49,000 oral cancer, 71,000 laryngeal cancer and 196,000 lung cancer cases in Bangladesh among those aged 30 years or above in Bangladesh (as of 2004).^[9]

3.6% of patients of same age group are hospital admitted due to these three cancers. A WHO supported hospital-based registry in the National Institute of Cancer Research and Hospital indicates that lung cancer in men (30%), cervical (26%) and breast cancer (23%) in women are the leading cancers in Bangladesh.^[9] These three cancers constitute 37% of all cancers irrespective sexes.

National Institute of Cancer Research and Hospital (2005) indicates top five cancers in male are – lungs (24.7%), unknown primary site (8.1%), larynx (7.3%), lymphatic and lymph node (7.3%) and esophagus (5.1%). Top five cancers in females are cervix (24.6%), breast (24%), lungs (5.5%), oral cavity (4.1%) and ovary (3.8%).¹⁰

The GLOBOCAN study (2008) reported that rates of deaths from respiratory tract (trachea, lung and bronchus) cancers are highest in Bangladesh compared to Sri Lanka, India, Afghanistan, Bhutan, Nepal, Pakistan.^[11]

According a study conducted on Bangladeshi Patients,^[12] 363 patients have been treated for colorectal cancer at the Royal London Hospital. 18 patients (5%) were of Bangladeshi origin. The prevalence was 27/100,000 compared to 342/100,000 of the Non-Bangladeshi population. 11 of 18 (61%) Bangladeshi patients were under the age of 40 and 4 patients (22%) presented with locally advanced or metastatic disease. In comparison 39/345 (11%) of non-Bangladeshi patients presented with advanced disease. None of the Bangladeshi patients gave a positive family history. Microarray profiling between these two groups demonstrated 1203 differentially expressed genes ($P < 0.05$).

1.6 Colon and Rectal Cancer

1.6.1 Colon cancer

Cancer that forms in the tissues of the colon (the longest part of the large intestine). Most colon cancers are adenocarcinomas which mean cancers that begin in cells that make and release mucus and other fluids.

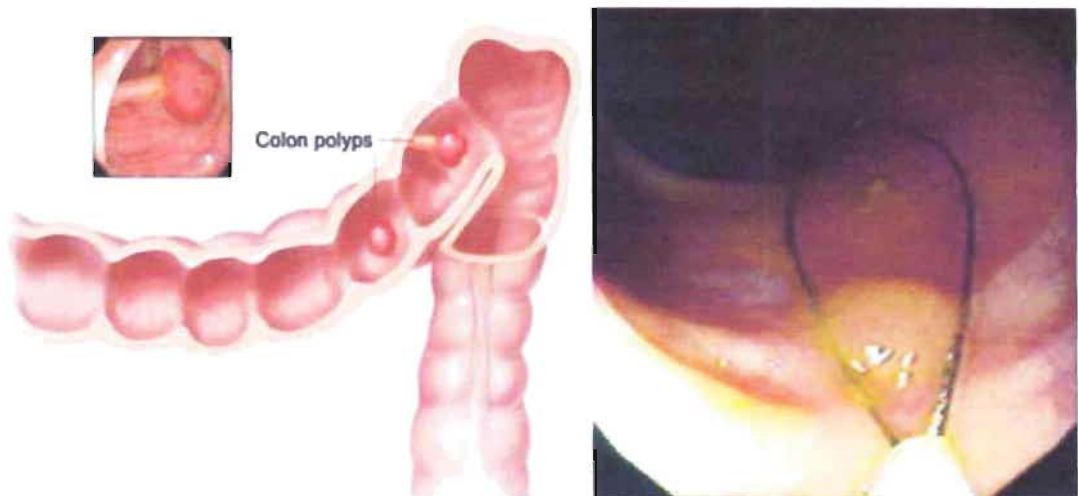


Figure 1.5 Cancer in the Colon and Polyp (Left) and Detection of Polyp during Colonoscopy (Right)

1.6.2 Rectal cancer: Cancer that forms in the tissues of the rectum (the last several inches of the large intestine closest to the anus).

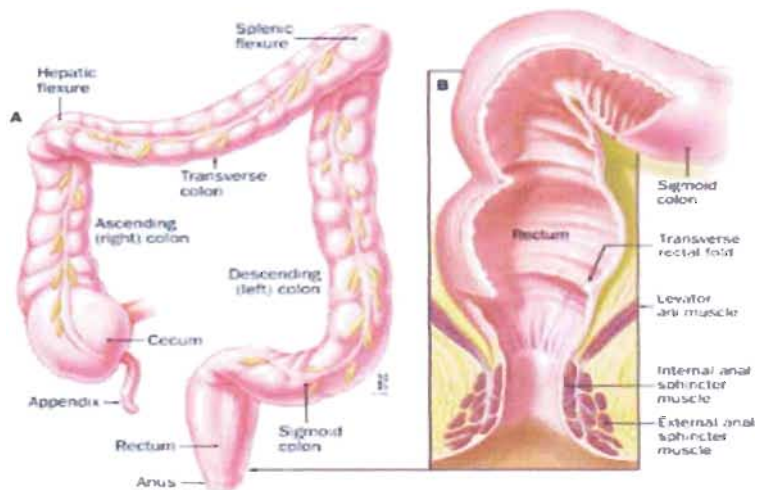


Figure 1.6 Places for Rectal Cancer

The Risk Factors, Symptoms, Diagnosis, Staging and treatments of colorectal cancers are give below ^[13]

1.7 Risk Factors:

A risk factor is something that may increase the chance of developing a disease.

Studies have found the following risk factors for colorectal cancer:

1.7.1 Age over 50: Colorectal cancer is more likely to occur as people get older. More than 90 % of people with this disease are diagnosed after age 50.

1.7.2 Colorectal polyps: Polyps are growths on the inner wall of the colon or rectum. They are common in people over age 50. Most polyps are benign (not cancer), but some polyps (adenomas) can become cancer.

1.7.3 Family history of colorectal cancer: Recognised familial syndromes account for about 5% of colorectal cancers. The commonest hereditary syndromes are familial adenomatous polyposis and heredity non-polyposis colon cancer. Patients with these syndromes usually have a family history of colorectal cancer presenting at an early age. Postulated reasons for this increased risk include “mild” APC and mismatch repair gene mutations, as well as polymorphisms of genes involved in nutrient or carcinogen metabolism. ^[14]

1.7.4 Genetic alterations: Changes in certain genes increase the risk of colorectal cancer.

- **Hereditary nonpolyposis colon cancer :** Hereditary non-polyposis colon cancer (also known as Lynch syndrome) became more widely recognised about 30 years ago in families manifesting mainly colorectal cancer segregating in an autosomal dominant fashion.

It is caused by changes in an HNPCC gene. Most people with an altered HNPCC gene develop colon cancer, and the average age at diagnosis of colon cancer is 44.

- **Familial adenomatous polyposis (FAP)** is a rare, inherited condition in which hundreds of polyps form in the colon and rectum. It is caused by a change in a specific gene called APC. Unless FAP is treated, it usually leads to colorectal cancer by age 40. FAP accounts for less than 1 % of all colorectal cancer cases.

1.7.5 Personal history of cancer: A person who has already had colorectal cancer may develop colorectal cancer a second time. Also, women with a history of cancer of the ovary, uterus (endometrium), or breast are at a somewhat higher risk of developing colorectal cancer.

1.7.6 Ulcerative colitis or Crohn's disease: One of the factors influencing an individual's risk is duration of colitis—the cumulative incidence of colorectal cancer is 5% at 15 years and 8-13% at 25 years. The extent of disease is also important: patients with involvement of right and transverse colon are more likely to develop colorectal cancer (the relative risk in these patients is 15 compared with the normal population). Coexisting primary sclerosing cholangitis independently increases the relative risk of ulcerative colitis associated neoplasia (UCAN) by 3-15%. In addition, high grade dysplasia in random rectosigmoid biopsies is associated with an unsuspected cancer at colectomy in 33% of patients. ^[14]

1.7.7 Diet: Studies suggest that diets high in fat (especially animal fat) and low in calcium, folate, and fiber may increase the risk of colorectal cancer. Also, some studies suggest that people who eat a diet very low in fruits and vegetables may have a higher risk of colorectal cancer. However, results from diet studies do not always agree, and more research is needed to better understand how diet affects the risk of colorectal cancer.

1.7.8 Cigarette smoking: A person who smokes cigarettes may be at increased risk of developing polyps and colorectal cancer.

1.8 Symptoms:

A common symptom of colorectal cancer is a change in bowel habits. Symptoms include:

- Having diarrhea or constipation
- Feeling that bowel does not empty completely
- Finding blood (either bright red or very dark) in stool
- Finding stools are narrower than usual
- Frequently having gas pains or cramps, or feeling full or bloated
- Losing weight with no known reason
- Feeling very tired all the time
- Having nausea or vomiting

Most often, these symptoms are not due to cancer. Other health problems can cause the same symptoms.

1.9 Screening:

Screening tests help to find polyps or cancer before having symptoms. Finding and removing polyps may prevent colorectal cancer. Also, treatment for colorectal cancer is more likely to be effective when the disease is found early.

To find polyps or early colorectal cancer:

- People in their 50's and older should be screened.
- People who are at higher-than-average risk of colorectal cancer should talk with their doctor about whether to have screening tests before age 50, what tests to have, the benefits and risks of each test, and how often to schedule appointments.

The following screening tests can be used to detect polyps, cancer, or other abnormal areas.

1.9.1 Fecal occult blood test (FOBT): Faecal occult blood tests are the most extensively studied screening tests for colorectal cancer. These tests detect haematin from partially digested blood in the stool. Their overall sensitivity for colorectal neoplasia is only 50-60%, though their specificity is high. In screening studies of faecal occult blood tests, individuals are invited to take two samples from each of three consecutive stools. Compliance is around 50-60%, but with population education this might be improved. Individuals with more than four out of six positive tests (about 2% of participants) need colonoscopy. Several large randomised studies have shown that screening with faecal occult blood testing is feasible, and two studies have shown that such screening reduces the mortality from colorectal cancer. In a study in Nottingham, for every 100 individuals with a positive test result, 12 had cancer and 23 had adenomatous polyps.^[15] The cancers detected at screening tended to be at an earlier stage than those presenting symptomatically (Dukes's A classification: 26% screen detected v 11% in controls). The disadvantage of screening with faecal occult bloods is its relatively low sensitivity—a third to a half of cancers will be missed on each round of screening. The Nottingham data suggest that screening every two years detects only 72% of cancers. This could be improved by testing annually and using more sensitive immunologically based faecal occult blood tests.

1.9.2 Sigmoidoscopy: Flexible sigmoidoscopy can detect 80% of colorectal cancers as it examines the whole of the left colon and rectum. A strategy of providing single flexible sigmoidoscopy for adults aged 55-65 years—with the aim of detecting adenomas—may be cost effective. A multicentre trial of this strategy for population screening is currently under evaluation.^[15] Although flexible sigmoidoscopy is more expensive than rigid sigmoidoscopy, it is generally more acceptable to patients (it is less uncomfortable) and has much higher yield than the rigid instrument.

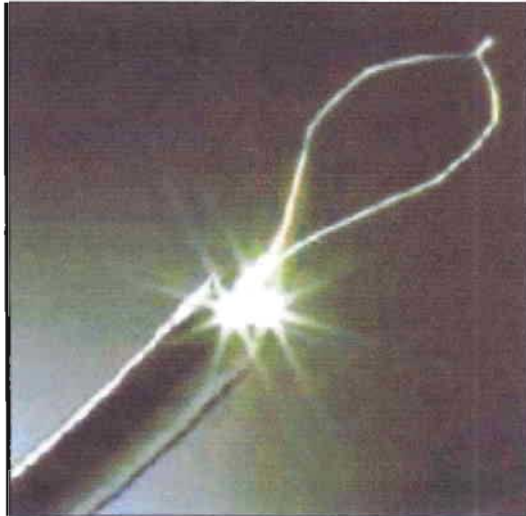


Figure 1.7 Flexible Sigmoidoscope to detect Adeno Carcinoma

1.9.3 Colonoscopy: Colonoscopy is the gold standard technique for examination of the colon and rectum, but its expense, the need for full bowel preparation and sedation, and the small risk of perforation of the colon make it unacceptable for population screening. Colonoscopy is, however, the investigation of choice for screening high risk patients (those at risk of hereditary non-polyposis colon cancer or with longstanding ulcerative colitis).



Figure 1.8 An Image taken from inside of the colon during Colonoscopy

1.9.4 Double-contrast barium enema: Barium enema, like colonoscopy, examines the whole colon and rectum, and, although it is cheaper and has a lower complication rate than

colonoscopy, it is invasive and requires full bowel preparation. Whereas colonoscopy may be therapeutic (polypectomy), barium enema does not allow removal or biopsy of lesions seen. There are no population screening studies using barium enema.



Figure 1.9: Double Contrast Barium Enema

1.9.5 Digital rectal exam: A rectal exam is often part of a routine physical examination. Doctor inserts a lubricated, gloved finger into rectum to feel for abnormal areas.

1.9.6 Virtual colonoscopy: This method is under study. **Virtual colonoscopy (VC, also called CT Colonography)** is a medical imaging procedure which uses x-rays and computers to produce two- and three-dimensional images of the colon (large intestine) from the lowest part, the rectum, all the way to the lower end of the small intestine and display them on a screen

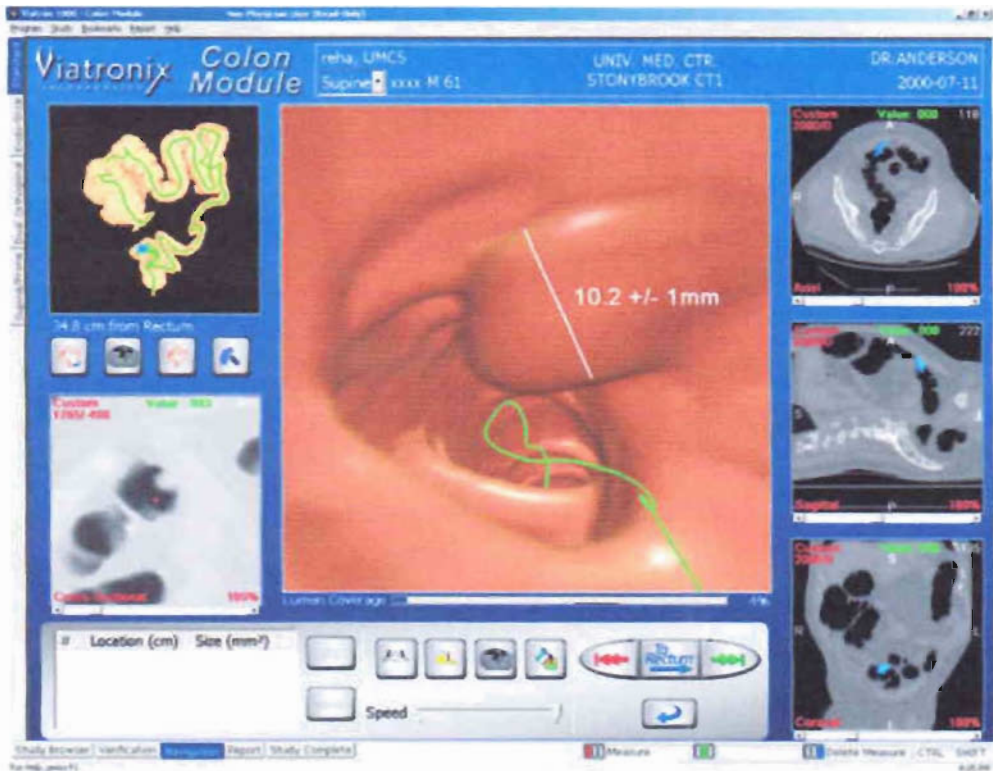


Figure 1.10: Virtual Colonoscopy

To confirm the screening test a biopsy test is done.

If the biopsy shows that cancer is present, doctor needs to know the extent (stage) of the disease to plan the best treatment. The stage is based on whether the tumor has invaded nearby tissues, whether the cancer has spread and, if so, to what parts of the body.

Doctors may order some of the following tests:

1.9.7 Blood tests: Specialists check for carcinoembryonic antigen (CEA) and other substances in the blood. Some people who have colorectal cancer or other conditions have a high CEA level.

1.9.8 Colonoscopy: If colonoscopy was not performed for diagnosis, doctor checks for abnormal areas along the entire length of the colon and rectum with a colonoscope.

1.9.9 Endorectal ultrasound: An ultrasound probe is inserted into rectum. The probe sends out sound waves that people cannot hear. The waves bounce off rectum and nearby tissues, and a computer uses the echoes to create a picture. The picture may show how deep a rectal tumor has grown or whether the cancer has spread to lymph nodes or other nearby tissues.

1.9.10 Chest x-ray: X-rays of chest may show whether cancer has spread to lungs.

1.9.11 CT scan: An x-ray machine linked to a computer takes a series of detailed pictures of areas inside body. Patients receive an injection of dye. A CT scan may show whether cancer has spread to the liver, lungs, or other organs.

Doctor may also use other tests (such as MRI) to see whether the cancer has spread. Sometimes staging is not complete until after surgery to remove the tumor.

1.10 Staging:

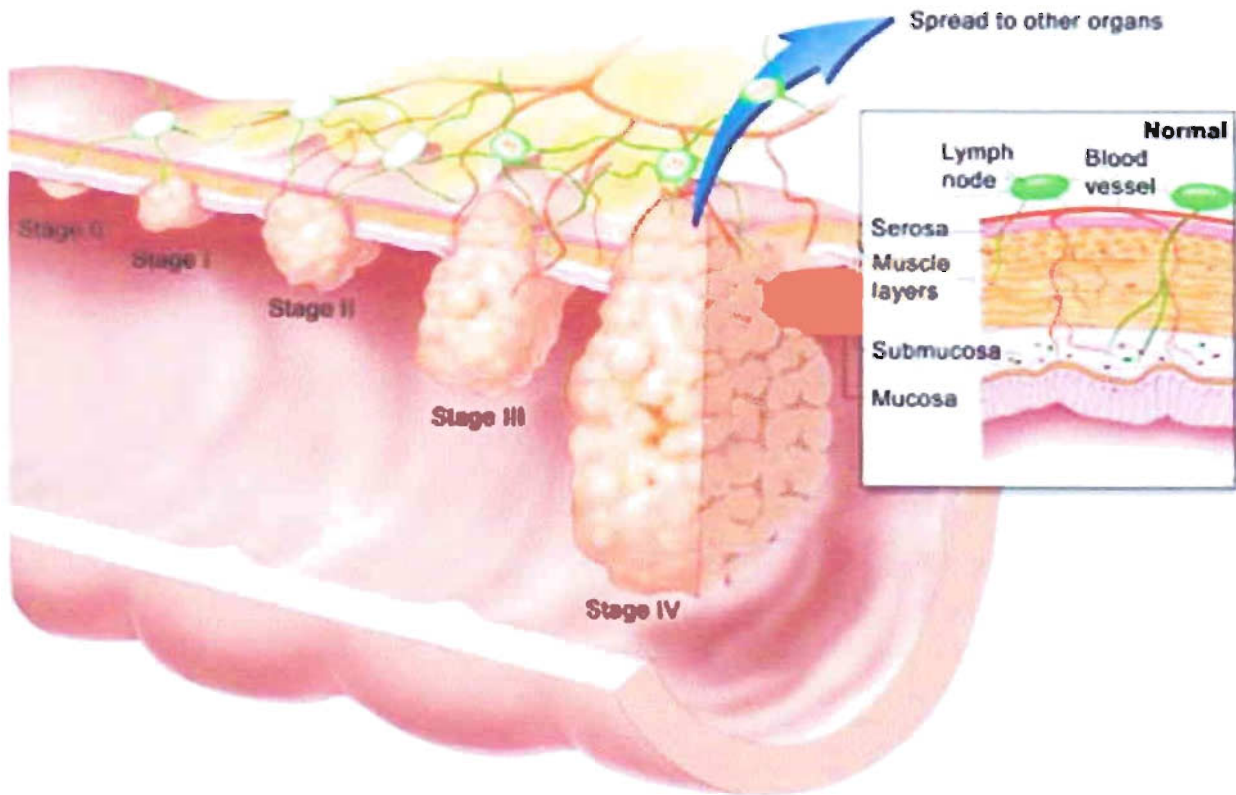


Figure 1.11 Staging of Cancer based on the invasive nature and nature of the border of the Malignant Tumor

Doctors describe colorectal cancer by the following stages ^[16]:

- **Stage 0:** The cancer is found only in the innermost lining of the colon or rectum. Carcinoma in situ is another name for Stage 0 colorectal cancer.
- **Stage I:** The tumor has grown into the inner wall of the colon or rectum. The tumor has not grown through the wall.
- **Stage II:** The tumor extends more deeply into or through the wall of the colon or rectum. It may have invaded nearby tissue, but cancer cells have not spread to the lymph nodes.
- **Stage III:** The cancer has spread to nearby lymph nodes, but not to other parts of the body.

- **Stage IV:** The cancer has spread to other parts of the body, such as the liver or lungs.

1.11 Recurrence

This is cancer that has been treated and has returned after a period of time when the cancer could not be detected. The disease may return in the colon or rectum, or in another part of the body.

1.12 Treatment:

The choice of treatment depends mainly on the location of the tumor in the colon or rectum and the stage of the disease. Treatment for colorectal cancer may involve surgery, chemotherapy, biological therapy or radiation therapy. Some people have a combination of treatments. These treatments are described below.

Colon cancer sometimes is treated differently from rectal cancer. Treatments for colon and rectal cancer are described separately below.

Cancer treatment is either local therapy or systemic therapy:

- **Local therapy:** Surgery and radiation therapy are local therapies. They remove or destroy cancer in or near the colon or rectum. When colorectal cancer has spread to other parts of the body, local therapy may be used to control the disease in those specific areas.
- **Systemic therapy:** Chemotherapy and biological therapy are systemic therapies. The drugs enter the bloodstream and destroy or control cancer throughout the body.

~~Because~~ cancer treatments often damage healthy cells and tissues, side effects are common. ~~Side~~ effects depend mainly on the type and extent of the treatment. Side effects may not be the same for each person, and they may change from one treatment session to the next.

1.12.1 Surgery: Surgery is the most common treatment for colorectal cancer.

- **Colonoscopy:** A small malignant polyp may be removed from colon or upper rectum with a colonoscope. Some small tumors in the lower rectum can be removed through anus without a colonoscope.
- **Laparoscopy:** Early colon cancer may be removed with the aid of a thin, lighted tube (laparoscope). Three or four tiny cuts are made into abdomen. The surgeon sees inside abdomen with the laparoscope. The tumor and part of the healthy colon are removed. Nearby lymph nodes also may be removed. The surgeon checks the rest of intestine and liver to see if the cancer has spread.
- **Open surgery:** The surgeon makes a large cut into abdomen to remove the tumor and part of the healthy colon or rectum. Some nearby lymph nodes are also removed. The surgeon checks the rest of intestine and liver to see if the cancer has spread.

When a section of colon or rectum is removed, the surgeon can usually reconnect the healthy parts. However, sometimes reconnection is not possible. In this case, the surgeon creates a new path to remove waste from body. The surgeon makes an opening (stoma) in the wall of the abdomen, connects the upper end of the intestine to the stoma, and closes the other end. The operation to create the stoma is called a colostomy. A flat bag fits over the stoma to collect waste, and a special adhesive holds it in place.

For most people, the stoma is temporary. It is needed only until the colon or rectum heals from surgery. After healing takes place, the surgeon reconnects the parts of the intestine and closes the stoma. Some people, especially those with a tumor in the lower rectum, need a permanent stoma.

1.12.2 Chemotherapy:

Chemotherapy uses anticancer drugs to kill cancer cells. The drugs enter the bloodstream and can affect cancer cells all over the body.

Anticancer drugs are usually given through a vein, but some may be given by mouth. Treatment may be given as an outpatient of the hospital, at the doctor's office, or at home. Rarely, a hospital stay may be needed.

The side effects of chemotherapy depend mainly on the specific drugs and the dose. The drugs can harm normal cells that divide rapidly:

- **Blood cells:** These cells fight infection, help blood to clot, and carry oxygen to all parts of body. When drugs affect blood cells, infections and bruise are more likely to occur or bleed easily, and feel very weak and tired.
- **Cells in hair roots:** Chemotherapy can cause hair loss. Hair will grow back, but it may be somewhat different in color and texture.
- **Cells that line the digestive tract:** Chemotherapy can cause poor appetite, nausea and vomiting, diarrhea, or mouth and lip sores.

Chemotherapy for colorectal cancer can cause the skin on the palms of the hands and bottoms of the feet to become red and painful. The skin may peel off.

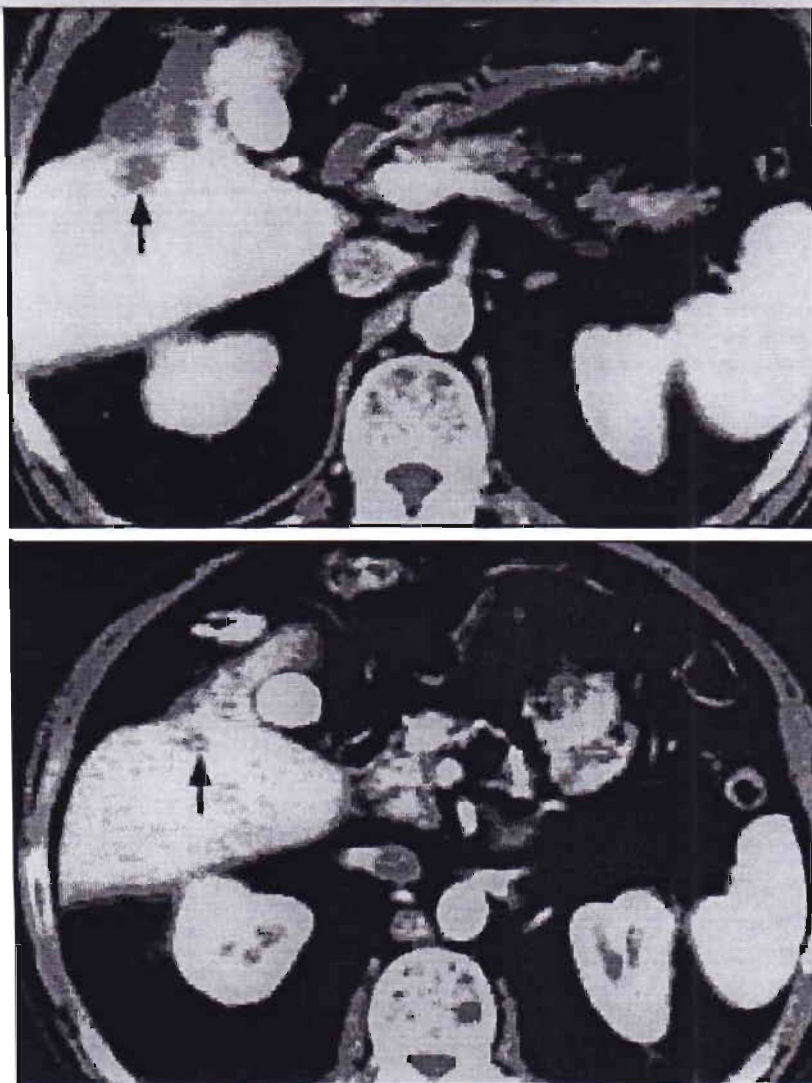


Figure 1.12 Abdominal computed tomogram showing a hepatic metastasis (arrow) before chemotherapy (top) and 17 weeks after chemotherapy (bottom); the later image shows a substantial reduction in the bulk of the hepatic tumour

1.12.3 Biological Therapy:

Some people with colorectal cancer that has spread receive a monoclonal antibody, a type of biological therapy. The monoclonal antibodies bind to colorectal cancer cells. They interfere with cancer cell growth and the spread of cancer. People receive monoclonal antibodies through a vein at the doctor's office, hospital, or clinic. Some people receive chemotherapy at the same time.

1.12.4 Radiation Therapy:

Radiation therapy (also called radiotherapy) uses high-energy rays to kill cancer cells. It affects cancer cells only in the treated area. Doctors use different types of radiation therapy to treat cancer. Sometimes people receive two types:

- **External radiation:** The radiation comes from a machine. The most common type of machine used for radiation therapy is called a linear accelerator. Most patients go to the hospital or clinic for their treatment, generally 5 days a week for several weeks.
- **Internal radiation (implant radiation or brachy therapy):** The radiation comes from radioactive material placed in thin tubes put directly into or near the tumor. The patient stays in the hospital, and the implants generally remain in place for several days. Usually they are removed before the patient goes home.
- **Intra-operative radiation therapy (IORT):** In some cases, radiation is given during surgery

In advanced colon cancer, radiotherapy is rarely indicated. In locally advanced rectal disease, localised radiation may render some tumours resectable. Radiotherapy can also be effective in palliation of symptoms—it can improve pain, stop haemorrhage, and lessen straining. In the absence of distant metastases, radiation may afford long term control of the tumour. Pain from isolated bone metastases can also be alleviated with short courses of radiation.

1.13 Rationale of the project work:

I choose this topic as my project work because I found that there is not enough work done on colorectal cancer in our country and I found it to be useful to conduct a study on this particular form of Cancer.

Another reason of choosing this topic was two co-incidents with my family members. I lost two of my close relatives who were suffering from colorectal cancer for a long day.

This project work is a large-scale population-based study of patients of colorectal cancer which assess a wide spectrum of possible parameters including the incident rate, symptoms and social outcomes of colorectal cancer and its treatment pattern. The group of patients was ascertained using the population-based database of **National Institute of Cancer Research & Hospital (NICRH)** of Bangladesh and **Bangabandhu Sheikh Mujib Medical University (BSMMU)**, Dhaka. The entire group of patients was being used for studies of long-term survival and as well as investigations of their different types of treatment pattern. The principal aspect of this study was to obtain estimates of the risk of particular adverse health and social outcomes occurring among survivors and to investigate variation of such risks in relation to several factors.

Therefore, all the results of this study might be used as an important tool for future decision making in the field of colorectal cancer treatment in Bangladesh.

CHAPTER -02: METHODS & MATERIALS

2. Methods & Materials

2.1. Methods

2.1.1 Number of Study Centre: 2 (Two)

2.1.2 Number of Patients: Male (Adult): 25

Female (Adult): 15

2.1.3 Study Site:

Study Centre 1: National Cancer Research Institute and Hospital (NCRIH)

Address- Mohakhali, Dhaka-1212, Bangladesh

Study Centre 2: Bangabandhu Sheikh Mujib Medical University (BSMMU)

Shahbagh, Dhaka-1000, Bangladesh

2.1.4 Duration of Study: 6 months.

2.1.5 Study type: Prospective Study.

2.1.6 Inclusion and Exclusion Criteria:

All the patients who underwent Colorectal Cancer treatment at the Department of Oncology of Bangabandhu Sheikh Mujib Medical University (BSMMU) and National Cancer Research Institute and Hospital (NCRH) during the study period were studied. All the patients who underwent Cancer treatment at the outdoor division of Cancer Research Institute during the study period were also included. Any patient who was affected in any stage of Colorectal Cancer was included.

2.1.7 Operational Modality:

Indoor (Hospitalized) & outdoor patients of Colorectal Cancer from Bangabandhu Sheikh Mujib Medical University (BSMMU) and National Cancer Research Institute and Hospital (NCRIH) were included. Information like age, sex, biophysical characteristics, sign and symptoms, risk

factors, stages of colorectal cancer, treatment pattern, drugs prescribed to treat Colorectal Cancer, duration of treatment, recurrence pattern of the disease, side effects of the treatment, family history were analyzed by using Microsoft word and Microsoft Excel software.

2.2 Volunteer Consent Form

I, the undersigned, authorize the research student to consider me as a volunteer for his/her research work. I understand that I can change my mind at any time to withdraw myself as volunteer during this research work.

Volunteer consent to study treatment---

Please tick as appropriate(s)

1. Have you any idea about the type, ultimate goal and methodology of the research?	Yes/No
2. Are you aware that you don't have to face physical, mental and social risk for this?	Yes/No
3. There will be no chance of major injury in any of your organs, are you aware of this?	Yes/No
4. Have you got any idea about the outcome of this experiment?	Yes/No
5. Do you think this experiment violate your human rights?	Yes/No
6. Are you sure that all the information regarding you will be kept confidentially?	Yes/No
7. No remuneration will be provided for this experiment, aware of this?	Yes/No

After reading this above mentioned points, I am expressing my consent to participate in this experiment as a volunteer.

Volunteer signature and date:

Volunteer's name:

Address: Witness:

[Please return the signed copy to the research student and keep an extra copy for yourself]

[Department of Pharmacy, East-West University, Mohakhali, Dhaka.]

2.3 Data Collection Form:

[PREVALENCE AND TREATMENT PATTERN OF COLORECTAL CANCER IN BANGLADESH]

1. Identification of patient:

1.1 ID code

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

1.2 Name:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

1.3 Father's/Husband's name:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

1.4

Male		Female	
------	--	--------	--

Sex:

1.5 Marital Status:

Married		Unmarried	
---------	--	-----------	--

1.6 Date of birth :
(dd/mm/yy)

--	--	--	--	--	--

(yr):

1.7 Age

--	--

1.8 Mailing address:

								ph						

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

1.9 Permanent address:

						ph									

1.10. Religion:

1.11 Nationality:

2. Socio-economic condition:

2.1 Area of Residence

Rural	Urban	S-urban	others

2.2 Education level	2.3 Occupations
Illiterate	Professional/managerial/business
Can read only	Clerical
Can write a letter	Technical
SSC or equivalent	Skilled worker
HSC or equivalent	Unemployed/pensioner
Graduate or higher	Housewife
Other	Others

2.4 Impression about social class:

Rich		Poor	
Upper middle		Destitute	
Lower middle			

2.5 smoking habit

Non smoker	
Ex-smoker>6Months	
Current smoker	

3. Biophysical characteristics:

3.1 Height (cm):

3.2 Pulse/min:

3.3 BP (sys/dias):

3.4 Temperature:

3.5.

	Before	After
Weight (Kg)		
Color		

4. Investigation of colorectal cancer patients:

4.1 Patient status:

Out patient	
In patient	
Length of hospital stay	

4.2 Age distribution:

Age group(Yrs)	
Less than 0	11-20
21 – 30	31-40
41-50	51-60
61 - 70	Greater than 70

4.3 Stage of colorectal cancer:

Stage I	
Stage II	
Stage III	
Stage IV	

4.4 Risk factors:

Age	
Diet (low fruit&vegetable)	
Polyps	
Chrono's disease	
History of ulcerative colitis	
Personal medical history of any cancer	
Family medical history of cancer	
Genetic alteration	Hereditary nonpolyposis colon cancer (HNPCC)
	Familial adenomatous polyposis (FAP)

4.5 Sign & symptoms of colorectal cancer

A change in bowel habits		General abdominal discomfort	
Diarrhea		Weight loss	
Constipation		Constant tiredness	
feeling of incomplete defecation (<u>tenesmus</u>)		Vomiting	
Blood in the stool(bright red or very dark)		black stool with a tarry appearance	
Stools that are narrower than usual		anemia	
pale appearance of the skin		palpitations	
Decreased appetite.		fever	
		jaundice	
abdominal pain		blood in the urine	

4.6 Diagnosis of colorectal cancer

4.6.1 Tests for colorectal cancer

Digital rectal exam (DRE)		Blood tests carcinoembryonic antigen (CEA)	
Fecal occult blood test (FOBT)		Positron emission tomography (PET)	
Sigmoidoscopy		Stool DNA testing	
Colonoscopy		Proctoscopy for Rectal Cancer	

Double contrast barium enema (DCBE)		Genetic Testing for Colon Cancer <i>APC</i> gene	
Ultrasonography		Magnetic resonance imaging (MRI)	
Angiography		Radionuclide Scanning	
chest x-rays,		CT scan of the lungs, liver, and abdomen.	

4.6.2 Haematology:

	Before treatment	Middle of the treatment	Present condition
Haemoglobin			
Esr			
Total WBC			
Carcinoembryonic antigen (CEA)			
Platelets			

4.6.3 Biochemical examination of patient:

	Before treatment	Middle of the treatment	Present condition
Bilirubin			
SGPT			
Pus cell			
S.urea			
S. creatinine			
Albumin (urine)			

4.6.4 Hepatic function:

Normal	
Abnormal	

4.6.5 Renal function

Normal	
Abnormal	

4.7 Treatment of colorectal cancer

4.7.1 Types of Treatment:

Surgery		Adjuvant Chemotherapy	
Chemotherapy		Immunotherapy	
Radiotherapy		Palliative chemotherapy	

4.7.2 Drugs used for treatment:

Brand name	Generic name	Therapeutic name

4.7.3 Treatment Condition:

Condition	Day	Month	Year
First treatment started			
First adverse effect started			
Treatment progress			

4.7.4 Whether the disease is recurrent or not:

Yes		No	
-----	--	----	--

4.8 Side effects of colorectal cancer treatment

Nausea		Poor appetite	
Vomiting		Diarrhea	
Fatigue		Mouth & lip sore	
Bloody stool		Chills	
Alopecia		Weakness	
Infection		Fever	
Change in skin		Bleeding	



Investigated by

Name:

Signature:

Date:

2.4 Study protocol:

For Colorectal Cancer Patients:

At first we selected the hospitals for study and applied for permission from the Authorized body (Director/Chairman) of the Oncology department of the Hospital to conduct the research work.

Then we selected the patients whom were admitted/ came for treatment in those hospitals and data were collected from them.

From the collected data the types of Colorectal Cancer problems were studied in Bangladesh as well as its treatment pattern.

Then the data were analyzed using Microsoft Excel.



CHAPTER 03: RESULTS

3. Results

3.1 Results

In our study 40 patients who were suffering from Colorectal cancer of different stage, were randomly selected from two different study centers during six months study period according to the method discussed earlier.

3.1.1 Gender variation in Colorectal Cancer

40 patients includes Male (n=25) and Female (n=15). The prevalence of colorectal cancer according to patient type was tabulated and shown by graph as follows.

Table 3.1 Prevalence of Male and Female in both study centers

Sex	Number of Patients	Percentage
Male	25	62%
Female	15	38%

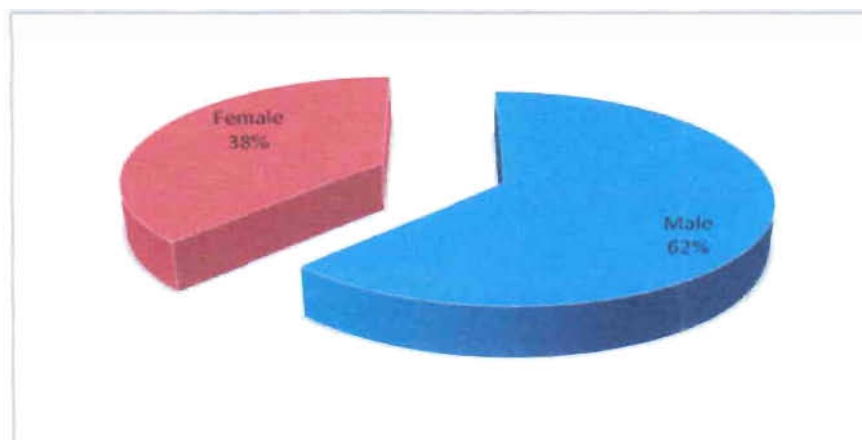


Figure 3.1- Prevalence of Male and Female in Colorectal Cancer in both study centers

From the Table 3.1 and Figure 3.1, it was observed that 62.5% of colorectal cancer patients were male and 32.50% were female.

3.1.2 Prevalence of marital Status in Colorectal Cancer

The prevalence of Colorectal Cancer on the basis of marital status was tabulated and graph was drawn below:

Table 3.2- Prevalence of Marital Status in Colorectal Cancer

Status	Number of Patients (n=40)	Percentage %
Married	34	85
Unmarried	6	15

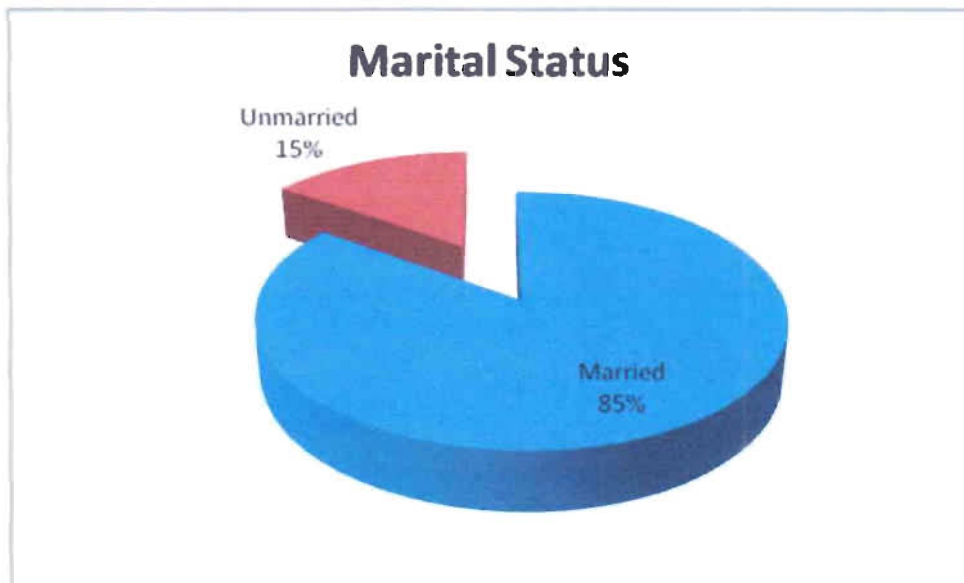


Figure 3.2. Prevalence of marital status in colorectal cancer

From the above table, it was observed that the prevalence of married Colorectal Cancer patient was 85% where as the Unmarried patients were only 15%.

3.1.3 Age distribution of Colorectal Cancer Patients

The prevalence of Colorectal Cancer Patients in both study centers according to age distribution was tabulated and a graph was drawn below:

Table 3.3- Age distribution Colorectal Cancer Patients

Age Group (Year)	Number of Patients	Percentage
Less than 0	0	0
1 to 10	0	0
11 to 20	4	10
21 to 30	10	25
31 to 40	5	12.5
41 to 50	8	20
51 to 60	11	27.5
61 to 70	2	5
Greater than 70	0	0



Figure 3.3 Age distribution of Colorectal Cancer patients

From the above Table 3.3 and Figure 3.3, it was observed that the most significant portion (27.5%) of patients affected was in the age range between 51-60 years. And the second largest portion (25%) affected patients was in the age range between 21-30 years. And the third largest portion (20%) affected patients was in between 41 and 50 years of age.

3.1.4 Place of living of Colorectal Cancer Patients (n=40)

Colorectal Cancer Patients are lived in different places that are presented in the following table and Figure.

Table 3.4- Place of living of Colorectal Cancer patients

Area	Number of patient	Percentage
Rural	19	47.5
Urban	7	17.5
Sub- Urban	14	35
Others	0	0

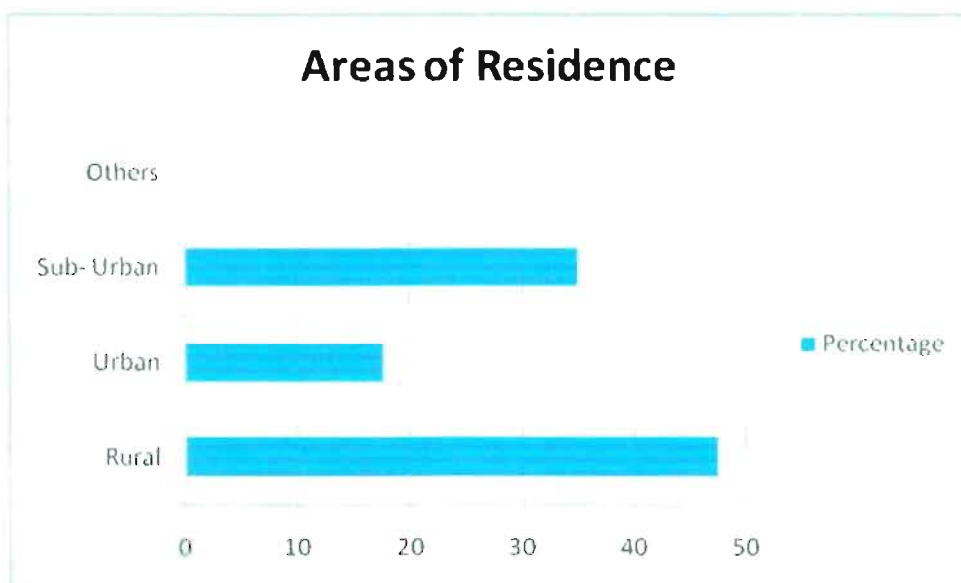


Figure 3.4- Place of living of Colorectal Cancer Patients

According to the table 3.4 and Figure 3.4, we can see that a higher percentage of patients who lived in rural area (47.5%) lived in rural is affected by Colorectal Cancer.

3.1.5 Social status of the patients (n=40)

Social classes of Colorectal Cancer patients are different that presented in the following table 3.5

Table 3.5- Social status of Colorectal Cancer Patients

Class	Number of Patients	Percentage
Rich	4	10
Upper-middle	6	15
Lower-middle	10	25
Poor	20	50
Destitute	0	0

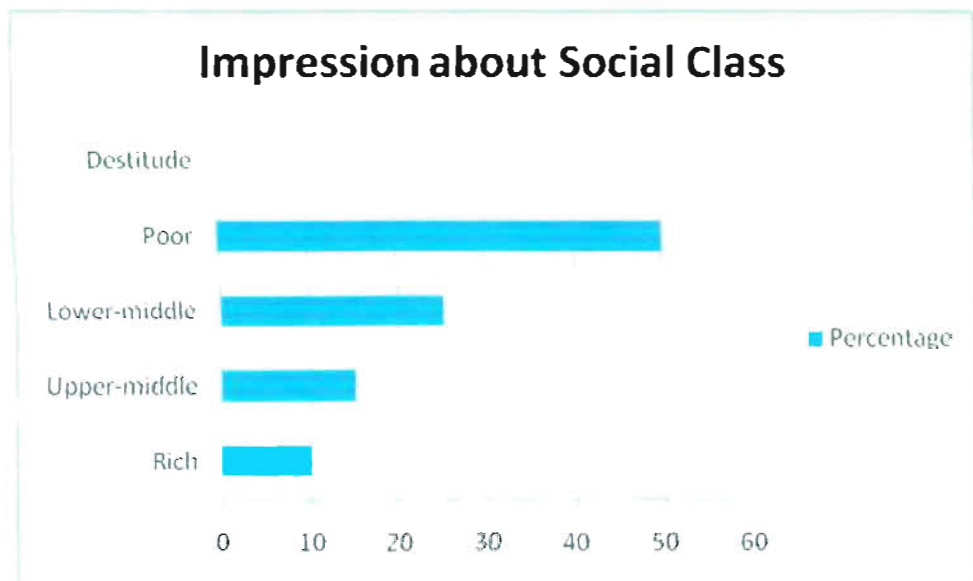


Figure 3.5- Social status of Colorectal Cancer Patients

From the Table 3.5 and Figure 3.5, we can say that a higher percentage (50%) of patients who are poor was affected by colorectal cancer.

3.1.6 Smoking habit of Colorectal Cancer Patients

Smoking habit of the Colorectal Cancer Patients is tabulated and graph was plotted as follows.

Table 3.6- Smoking Habit of Colorectal Cancer Patients

Status	Number of Patients	Percentage
Smoker	5	12.5
Ex- Smoker (> 6 months)	15	37.5
Non-smoker	20	50

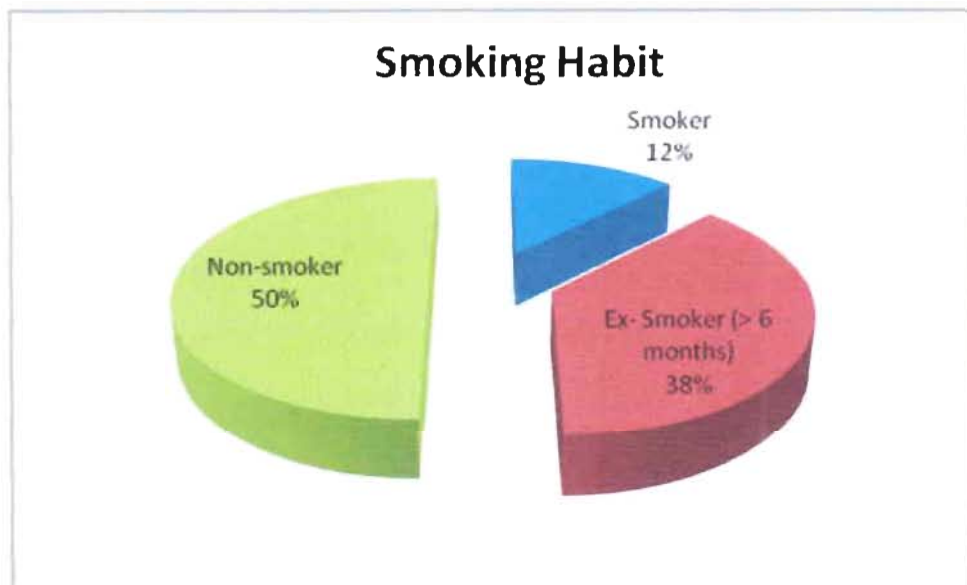


Figure 3.6- Smoking Habit of Colorectal Cancer Patients

From this Table 3.6 and Figure 3.6, we see that 50% of the patients were non-smoker where 38% of the of the patients were ex-smoker (Quit smoking less than 6 months ago) and 12% of the patients were current smoker.

3.1.7 Education Level of the Colorectal Cancer Patients (n=40)

Education Level of Colorectal Cancer patients are different that presented in the following table 3.7

Table 3.7- Education Level of Colorectal Cancer Patients

Education Level	Number of Patients	Percentage
Illiterate	5	12.5
Can read Only	9	22.5
SSC or Equivalent	6	15
HSC or Equivalent	10	25
Graduate or Higher	10	25
Others	0	0

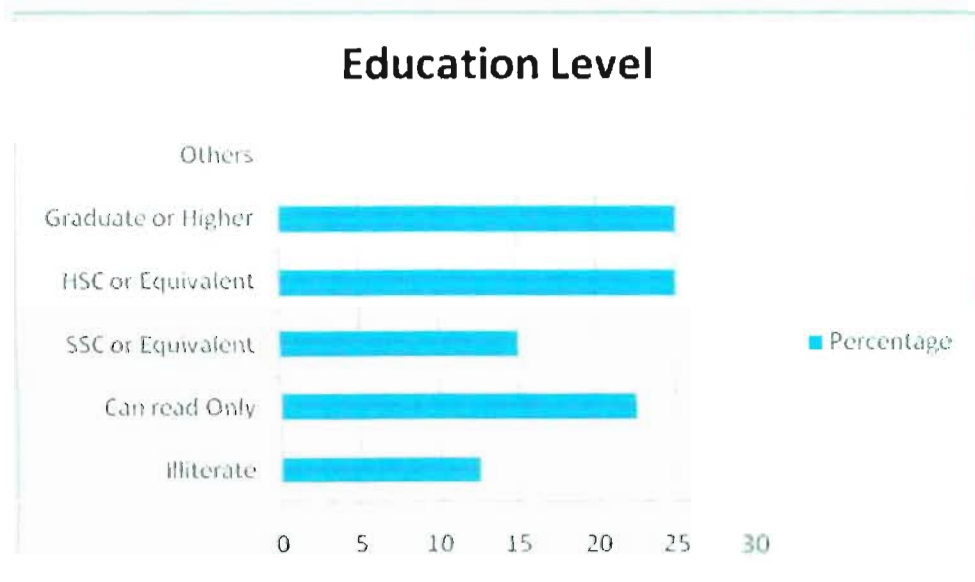


Figure 3.7- Education Level of Colorectal Cancer Patients

From the Table 3.7 and Graph 3.7, it was seen that the Higher percentage (25%) of the people were HSC or Equivalent. The percentages (25%) of the people were Graduate. The percentage of illiterate patients was 12.5%.

3.1.8 Height of Colorectal Cancer Patients

Height of Colorectal Cancer patients is tabulated and a graph was plotted as follows-

Table 3.8- Height of Colorectal Cancer patients

Range	Number of Patients	Percentage
Below 4'-6"	0	0
4'-6" - 4'-9"	0	0
4'-9" - 5'-0"	5	12.5
5'-0" - 5'-3"	16	40
5'-3" - 5'-6"	15	37.5
5'-6" - 5'-9"	6	15
5'-9" - 6'-0"	0	0
6'-0" - 6'-3"	0	0
Above 6'-3"	0	0

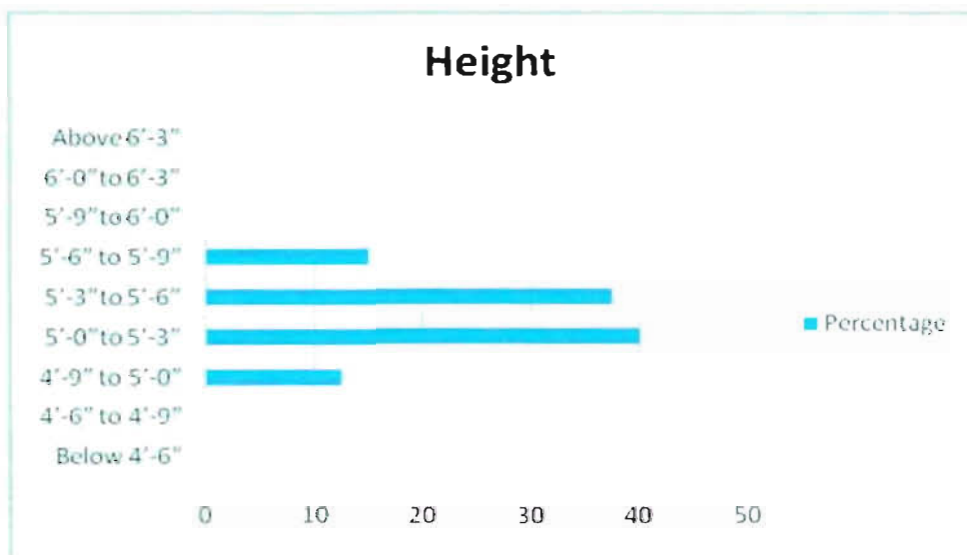


Figure 3.8- Height of Colorectal Cancer Patients

This Table 3.8 and Figure 3.8, describes the occurrence of Colorectal Cancer in different body height. Here, we see that the height between 5'-0" to 5'-3" are most affected by Colorectal Cancer (40%) followed by the patient having height between 5'-3"-5'6" (37.5%).

3.1.9 Pulse rate of Colorectal Cancer Patients

Percentage of Pulse rate Colorectal Cancer Patients are presented in the following table and Figure.

Table 3.9- Pulse Rate of Colorectal Cancer patients

Pulse Rate	Number of Patients	Percentage
Above Normal (More Than 80 bpm)	16	40
Normal (70 bpm- 80bpm)	22	55
Below Normal (Below 70bpm)	2	5

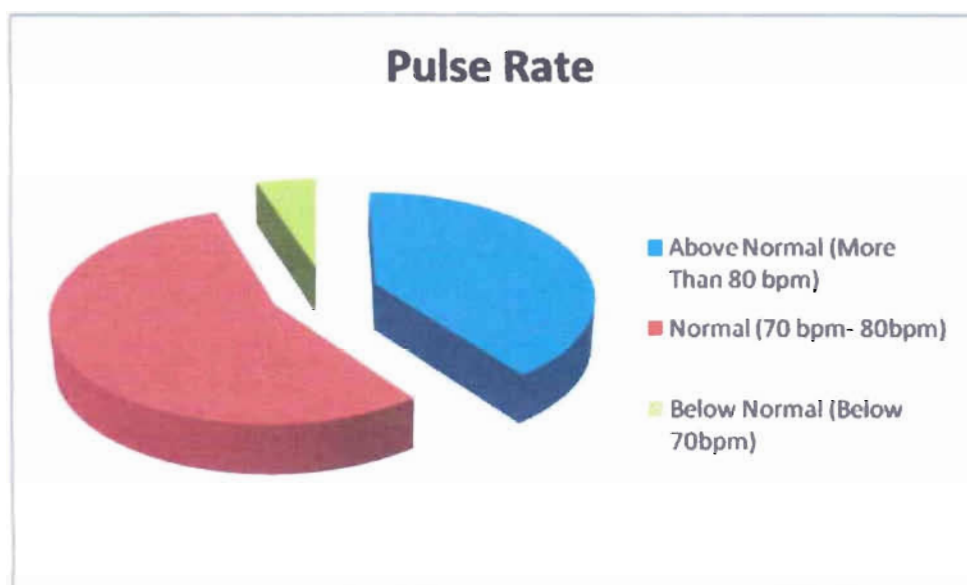


Figure 3.9- Pulse rate of Colorectal Cancer Patients

From this Table 3.9 and Figure 3.9, we can see that a higher percentage (55%) of Colorectal Cancer patients have normal pulse rates. Rest of the patients have abnormal pulse rates. Among them 40% patients have above normal pulse rates and 5% patients have pulse rate below normal rate.

3.1.10 Weight of Colorectal Cancer Patients (Before treatment)

Following Table (3.10) and Figure (3.10) shows the weight of the Colorectal Cancer patients before starting the treatment.

Table 3.10- Weight of Colorectal Cancer Patients

Weight Range (KG)	Number of Patients	Percentage
30- 35	1	2.5
36-40	7	17.5
41-45	24	60
46-50	7	17.5
51-55	1	0

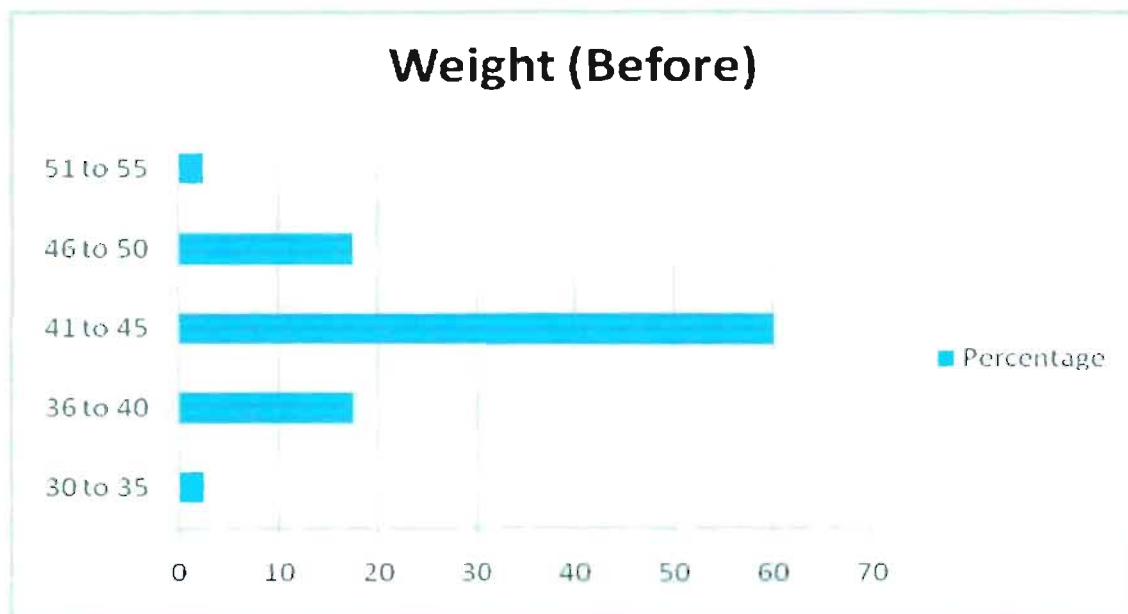


Figure 3.10 Weight of Colorectal Cancer Patients before treatment

From this Table 3.10 and Table 3.10, we see that a higher percentage of body weight (60%) of the Colorectal patients were between 41 KG and 45. (Before treatment).

3.1.11 Weight of Colorectal Cancer Patients (After treatment)

Following Table (3.11) and Figure (3.11) shows the weight of the Colorectal Cancer patients after starting the treatment.

Table 3.11- Weight of Colorectal Cancer Patients

Wight Range	Number of Patients	Percentage
Below 30	0	0
31-35	18	45
36-40	15	37.5
41-45	4	10
46-50	2	5
51-55	1	2.5

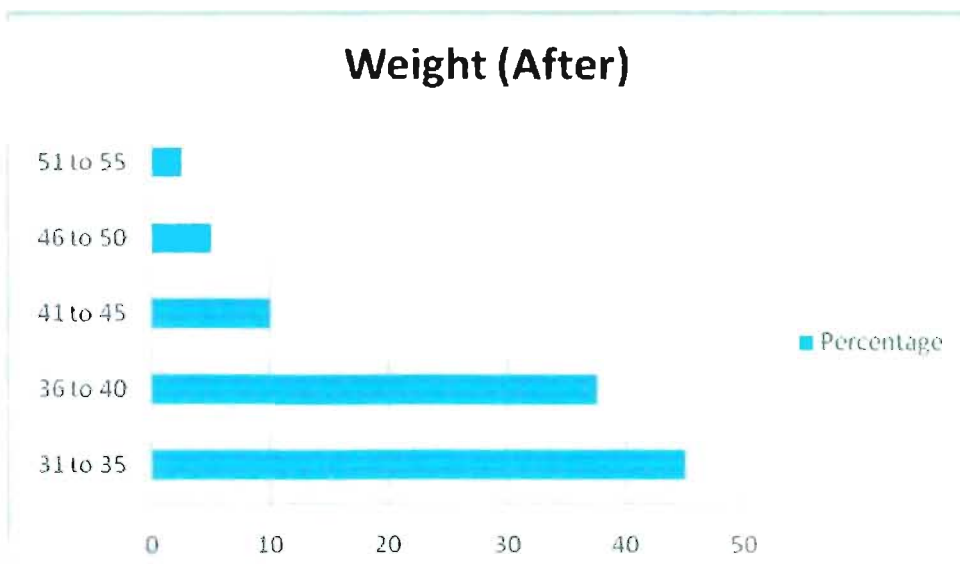


Figure 3.11- Wight of Colorectal Cancer patient after treatment

From this Table 3.11 and Table 3.11, we see that a higher percentage of body weight (45%) of the colorectal patients were between 31 kg and 35 (After treatment).

3.1.12 Hospitalization Status (In-patient/ Out-Patient) of Colorectal Cancer Patients

Status of the Patients whether they are In-patient (hospitalized) or Out- Patient is shown in the following table and Figure below.

Table 3.12- Hospitalization Status of Colorectal Cancer Patients

Status	Number of Patients	Percentage
In- Patient	10	25
Out Patient	30	75

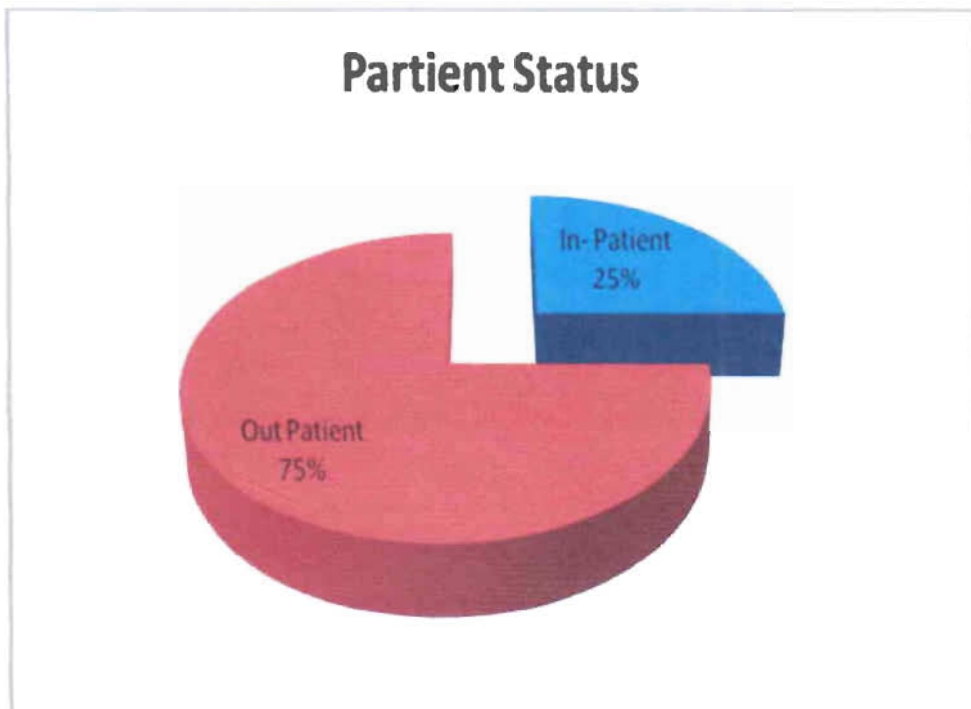


Figure 3.2- Hospitalization Status of Colorectal Cancer Patients

From the Table 3.12 and the Figure 3.12, we see that 75% of Colorectal Patients were out-patients (All are from National Cancer Research Institute and Hospital) and 25% were In-patients.

3.1.13 Length of Hospital Stay (In case of In-patients)

The following Table 3.13 and Figure 3.13 shows the length of Hospital stay of Colorectal Cancer patients.

Table 3.13- Length of Hospital stay (For In Patients)

Range (days)	Number of Patient	Percentage
Less Than 7 days	1	12.5
7-14 days	2	25
14-21 days	2	12.5
21-28 days	2	12.5
28-35 days	1	12.5
35-42 days	1	12.5
42-49 days	0	0
50-56 days	0	0
More than 56 days	1	12.5

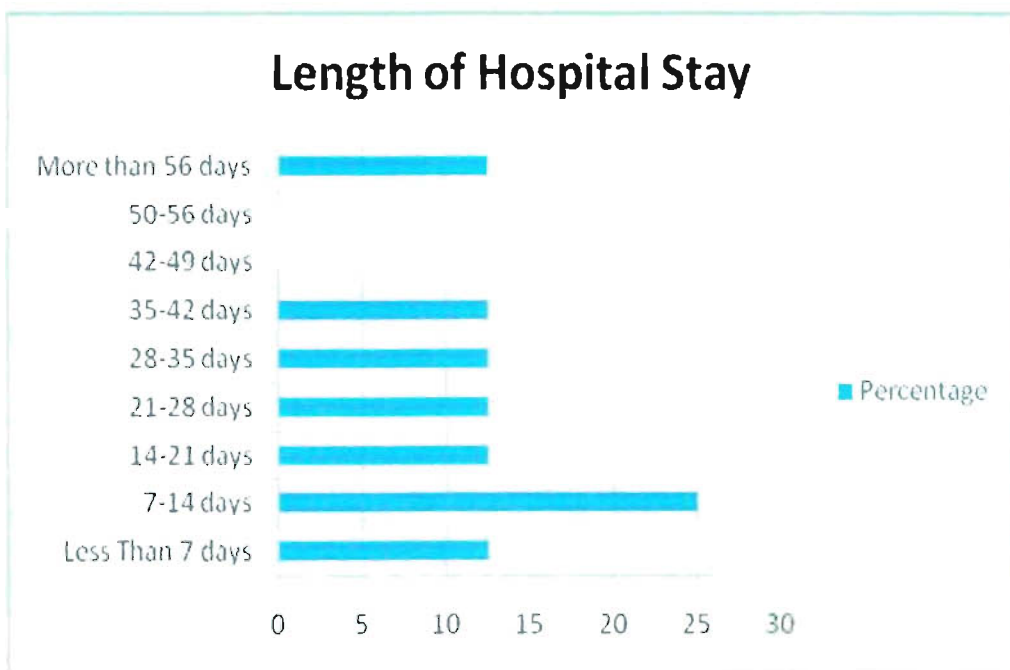


Figure 3.13 Length of Hospital stay (For In Patients)

From the Table 3.13 and Figure 3.13, we see that the higher percentage of Length of Hospital stay (25%) for the Colorectal Cancer patient was between 7 and 14 days.

3.1.14 Stage of Colorectal Cancer

The following Table 3.14 and Figure 3.14 show the stages of Colorectal Cancer among the patients.

Table 3.14- Stages of Colorectal Cancer among the patients

Stage	Number of Patients	Percentage
Stage-I	16	40
Stage-II	8	20
Stage-III	7	17.5
Stage-IV	9	22.5

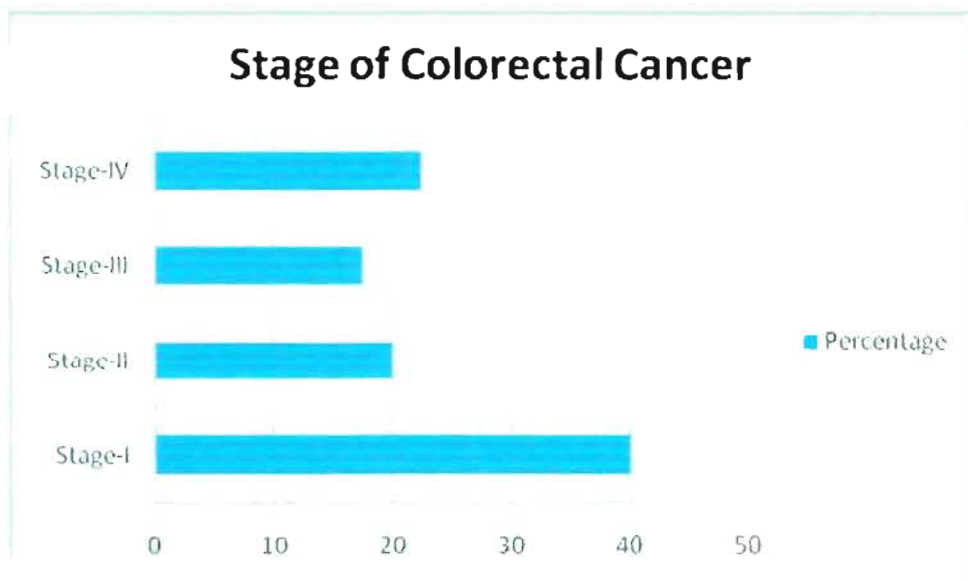


Figure 3.14- Stages of Colorectal Cancer among the patients

From the Table 3.14 and Figure 3.14 above, we see that the higher percentage of the Colorectal Cancer patients (40%) is suffering from Stage-I Colorectal Cancer.

3.1.15 Risk Factors for Colorectal Cancer Patients.

In the following Table 3.16 and Figure 3.1, the risk factors observed in the patients in the both study centers are drawn and plotted below-

Table 3.15- Risk Factors for Colorectal Cancer patients

Factors	Number of Patients	Percentage
Age	9	22.5
Diet (low fruit&vegetable)	27	67.5
Polyps	23	57.5
Chrono's disease	1	2.5
History of ulcerative colitis	3	7.5
Personal medical history of any cancer	4	10
Family medical history of cancer	8	20
Hereditary nonpolyposis colon cancer (HNPCC)	1	2.5
Familial adenomatous polyposis (FAP)	0	0
Smoking	6	15

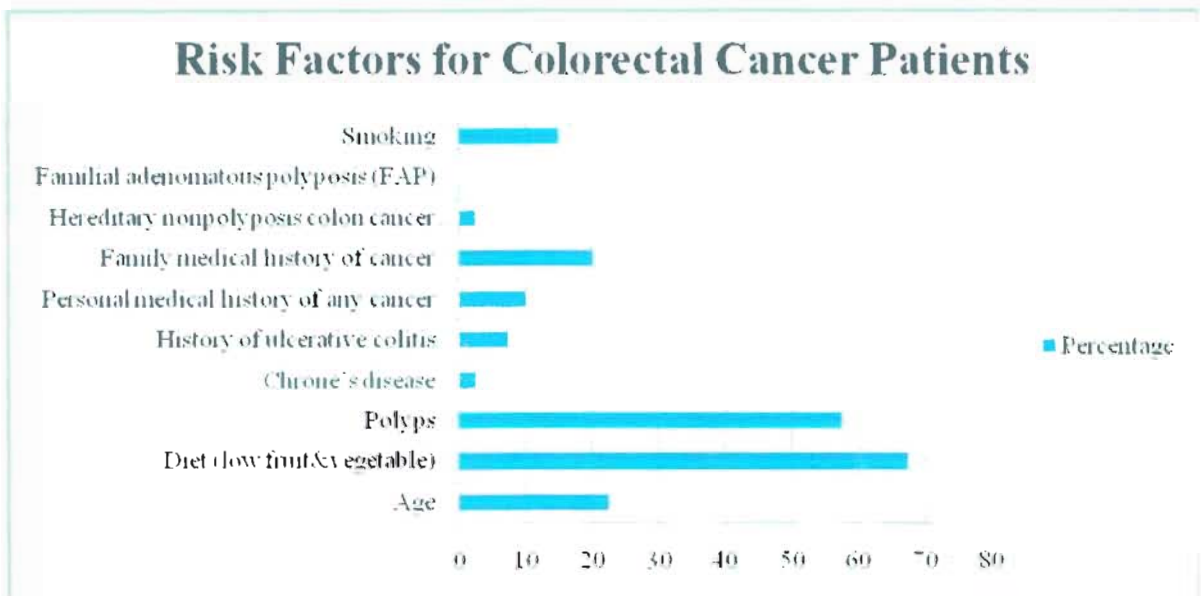


Figure 3.15 Risk Factors for Colorectal Cancer patients

From the Table 3.15 and Figure 3.15, we see that Diet (having Low fruit and Vegetable) the higher percentage of Risk factor (67.5%) followed by Polyps (57.5%).

3.1.16 Sign and Symptoms of Colorectal Cancer

The sign and Symptoms of Colorectal Cancer observed in the patients in both study centers are drawn and plotted below.

Table 3.16- Signs and Symptoms of Colorectal Cancer

Signs	Number of Patients	Percentage
A change in bowel habits	11	27.5
Diarrhea	8	20
Constipation	12	30
Feeling of incomplete defecation (tenesmus)	5	12.5
Blood in the stool(bright red or very dark)	27	67.5
General abdominal discomfort	13	32.5
Weight loss	16	40
Constant tiredness	11	27.5
Vomiting	1	2.5
Black stool with a tarry appearance	10	25
Stools that are narrower than usual	6	15
Pale appearance of the skin	9	22.5
Decreased appetite.	13	32.5
Abdominal pain	14	35
Anemia	13	32.5
Palpitations	1	2.5
Fever	4	10
Jaundice	4	10
Blood in the urine	1	2.5
Anal Pain	1	2.5

Signs and Symptoms of Colorectal Cancer among the Patients

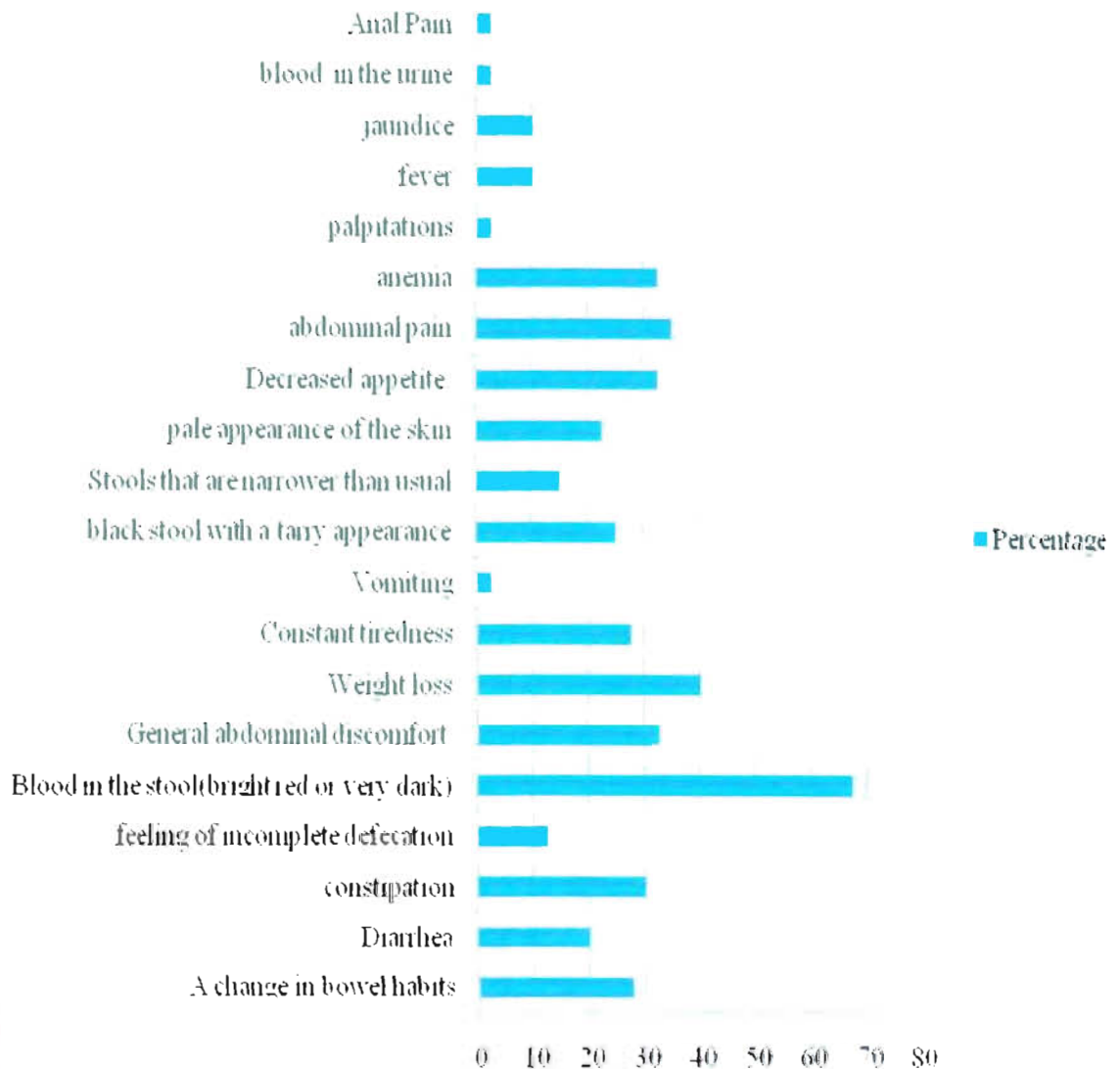


Figure 3.16- Sign and Symptoms of Colorectal Cancer

From the Table 3.16 and Figure 3.16 we see that there was a variation of signs and Symptoms of Colorectal cancer among the patients. The higher percentage of the Symptom (67.5%) was Blood in the stool having a bright red or very dark color).

3.1.17 Tests for Colorectal Cancer

Colorectal Cancer patients were examined or tested in variety of ways in the study centers which are plotted and drawn below-

Table 3.17- Tests for Colorectal Cancer Patients

Tests	Number of Patients	Percentage
Digital rectal exam (DRE)	18	45
Fecal occult blood test (FOBT)	22	55
Sigmoidoscopy	1	2.5
Colonoscopy	13	32.5
Double contrast barium enema (DCBE)	6	15
Ultrasonography	20	50
Angiography	3	7.5
chest x-rays,	9	22.5
Blood tests carcinoembryonic antigen (CEA)	13	32.5
Positron emission tomography (PET)	0	0
Stool DNA testing	0	0
Proctoscopy for Rectal Cancer	7	17.5
Genetic Testing for Colon Cancer APC gene	0	0
Magnetic resonance imagingMRI	5	12.5
Radionuclide Scanning	0	0
	0	0
CT scan of the lungs, liver, and abdomen.	14	35
Biopsy	14	35
ECG	2	5
Anti HCV	2	5
HBsAg	1	2.5
Endoscopy	1	2.5
Urine Test	1	2.5

From the Table 3.17, we see that, the most observed test for diagnose Colorectal cancer is Fecal Occult Blood Test (55%). The second most observed diagnostic test is Ultrasonography (50%) followed by Digital Rectal Exam (45%) or Colonoscopy (32.5%) on the basis of the nature of the Cancer whether it is Colon Cancer or Rectal cancer.

3.1.18 Hematology Data of Colorectal Cancer Patients

Different Hematology data are presented in the following Charts and Tables.

3.1.18.1 Haemoglobin Data of Colorectal Cancer patients

Haemoglobin Data of Colorectal Cancer patients are given in the following Table 3.18.1 and figure 3.1.19

Table 3.18.1- Haemoglobin Data of Colorectal Cancer Patient

Status	Number of Patient	Percentage
Normal	15	37.5
Below Normal	25	62.5

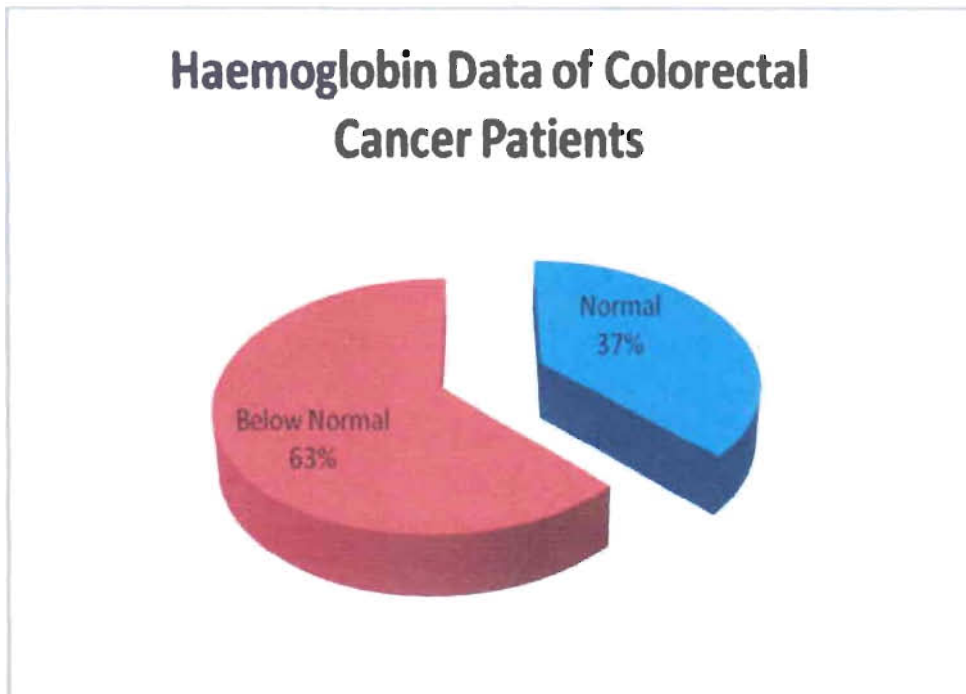


Figure 3.18.1- Haemoglobin Data of Colorectal Cancer Patient

In the Table 3.18.1 and Figure 3.18.1, we see that 63% of the patients have Hemoglobin below normal Stage.

3.1.18.2 ESR Data of Colorectal Cancer patients

ESR Data of Colorectal Cancer patients are given in the following Table 3.18.2 and figure 3.18.2

Table 3.18.2- ESR Data of Colorectal Cancer Patient

Status	Numer of Patients	Percentage
Above Normal	10	25
Normal	5	12.5
Below Normal	25	62.5

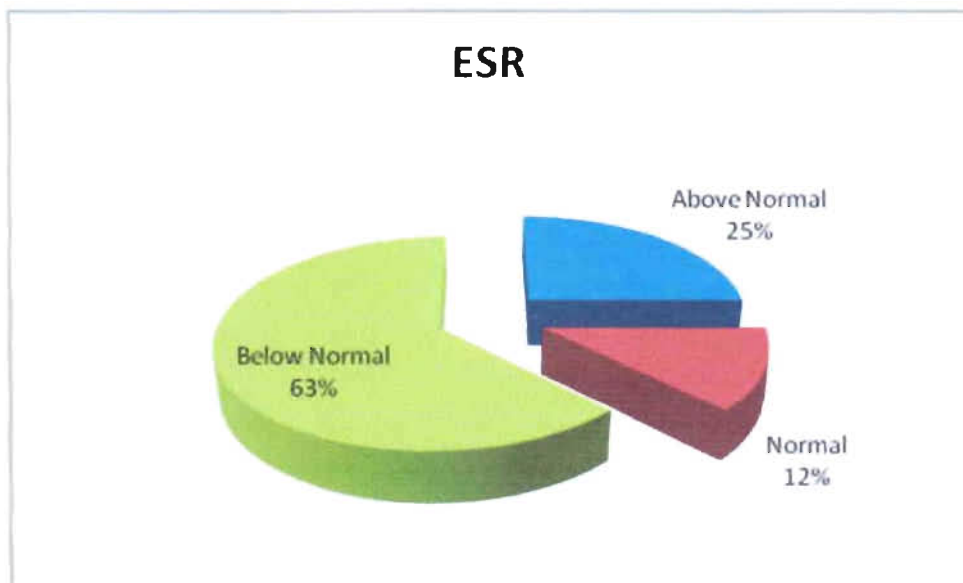


Figure 3.18.2- ESR Data of Colorectal Cancer Patient

In the Table 3.18.2 and Figure 3.18.2, we see that 63% of the patients have ESR below normal Stage. And 25% of the patients have ESR above normal stage.

3.1.18.3 Total WBC data of Colorectal Cancer Patients

Total WBC Data of Colorectal Cancer patients are given in the following Table 3.18.3 and figure 3.18.3

Table 3.18.3- Total WBC Data of Colorectal Cancer Patient

Status	Number of Patients	Percentage
Above Normal	10	25
Normal	20	50
Below Normal	10	25

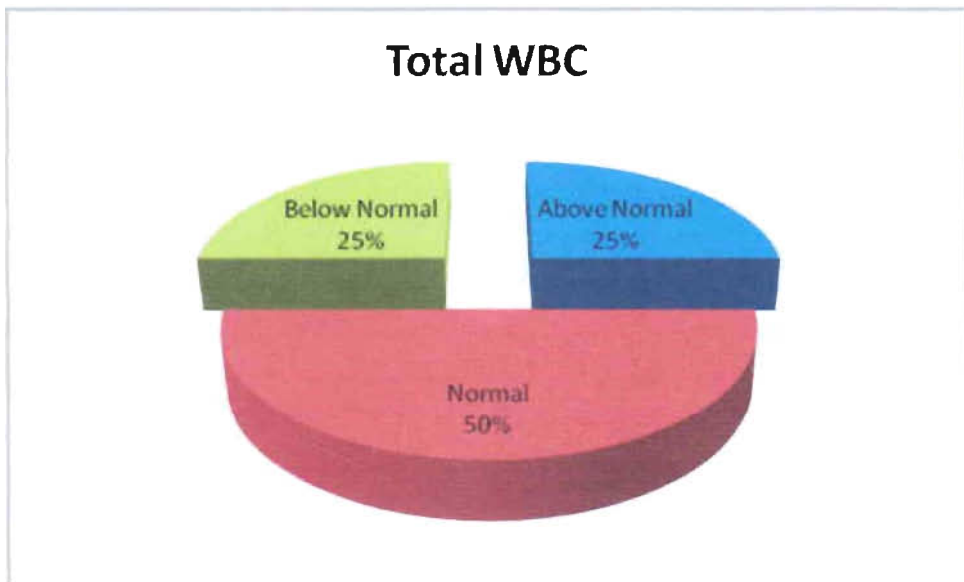


Figure 3.18.3- Total WBC of Colorectal Cancer Patients

In the Table 3.18.3 and Figure 3.18.3, we see that 50% of the patients have Total WBC count below normal Stage. And 25% of the patients have Total WBC count above normal stage.

3.1.18.4 Platelet count data of Colorectal Cancer Patients

Total Platelet Count Data of Colorectal Cancer patients are given in the following Table 3.18.4 and figure 3.18.4

Table 3.18.4- Total Platelet Count Data of Colorectal Cancer Patients

Status	Number of Patients	Percentage
Above Normal	4	10
Normal	20	50
Below Normal	6	15

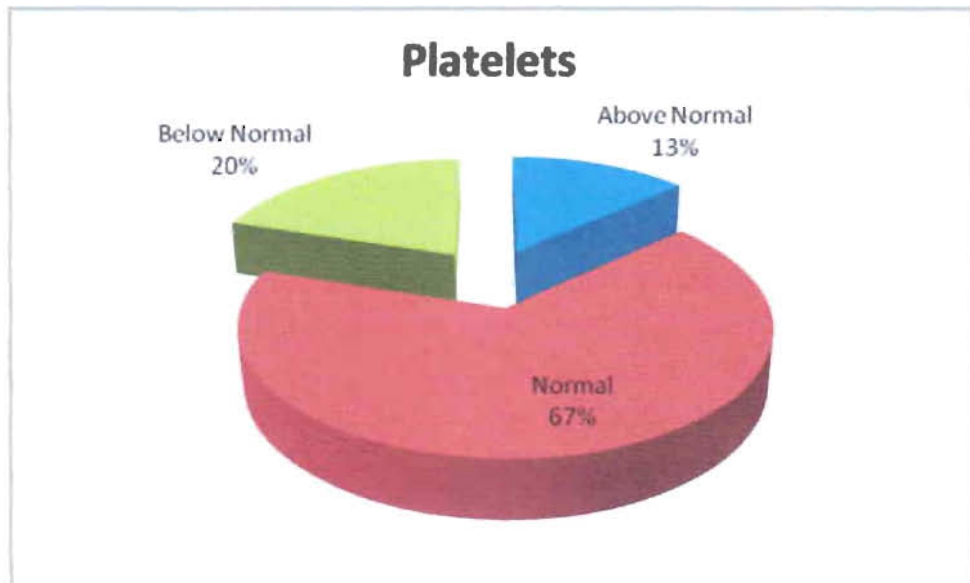


Figure 3.18.4- Total Platelet Count Data of Colorectal Cancer Patients

In the Table 3.18.4 and Figure 3.18.4, we see that 67% of the patients have Total WBC count below normal Stage. And 13% of the patients have Total WBC count above normal stage.

3.1.18.5 Carcinoembryonic Antigen (CEA) data of Colorectal Cancer Patients

Total Carcinoembryonic Antigen (CEA) Data of Colorectal Cancer patients are given in the following Table 3.18.5 and figure 3.18.5

Table 3.18.5- Carcinoembryonic Antigen (CEA) Data of Colorectal Cancer Patients

Status	Number of Patients	Percentage
Above Normal	6	50
Normal	6	50
Below Normal	0	0

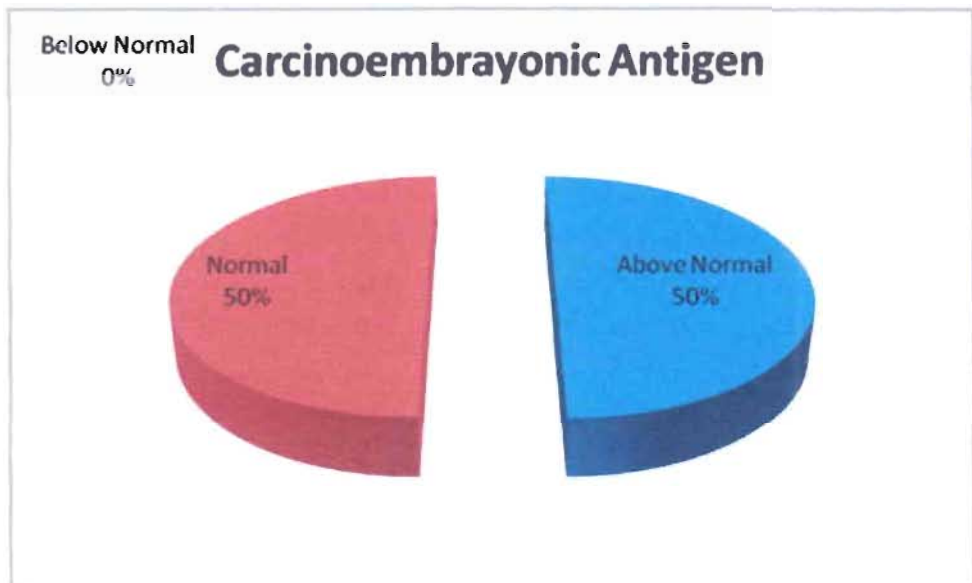


Figure 3.18.5- Carcinoembryonic Antigen (CEA) Data of Colorectal Cancer Patients

In the Table 3.18.5 and Figure 3.18.5, we see that 50% of the patients have Carcinoembryonic Antigen (CEA) below normal Stage. And 50% of the patients have Carcinoembryonic Antigen (CEA) in normal stage.

3.1.19 Biochemical Examination data of Colorectal Cancer patients

3.1.19.1 Bilirubin Data of Colorectal Cancer Patients

Bilirubin Data of Colorectal Cancer patients are given in the following Table 3.19.1 and figure 3.19.1

Table 3.19.1- Bilirubin Data of Colorectal Cancer Patients

Status	Number of Patients	Percentage
Above Normal	7	21.875
Normal	25	78.125
Below Normal	0	0

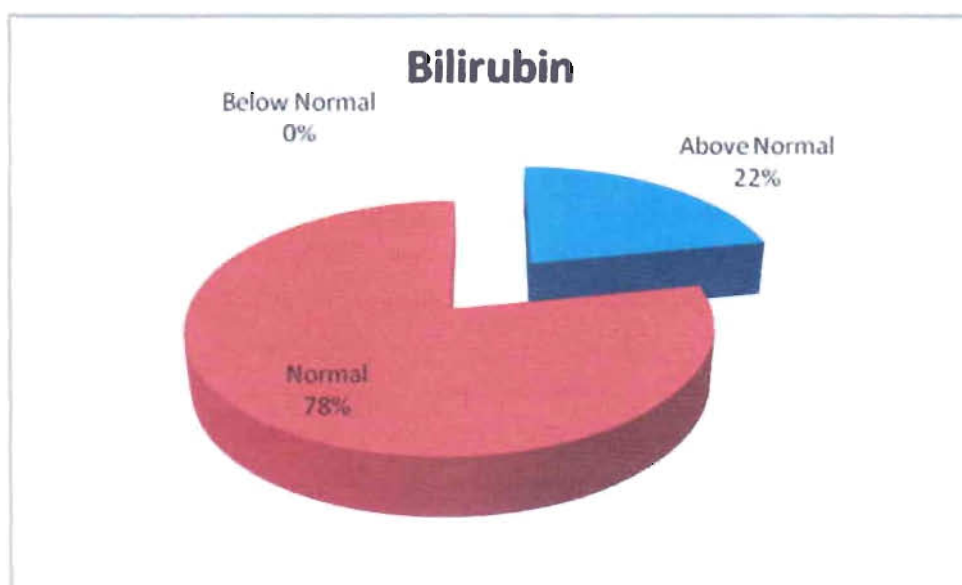


Figure 3.19.1- Bilirubin Data of Colorectal Cancer Patients

In the Table 3.19.1 and Figure 3.19.1, we see that 78% of the patients have Bilirubin in normal Stage. And 22% of the patients have Bilirubin above normal stage.

3.1.19.2 SGPT Data of Colorectal Cancer Patients

SGPT Data of Colorectal Cancer patients are given in the following Table 3.19.2 and figure 3.19.2

Table 3.19.2- SGPT Data of Colorectal Cancer Patients

Status	Number of Patients	Percentage
Above Normal	9	36
Normal	16	64
Below Normal	0	0

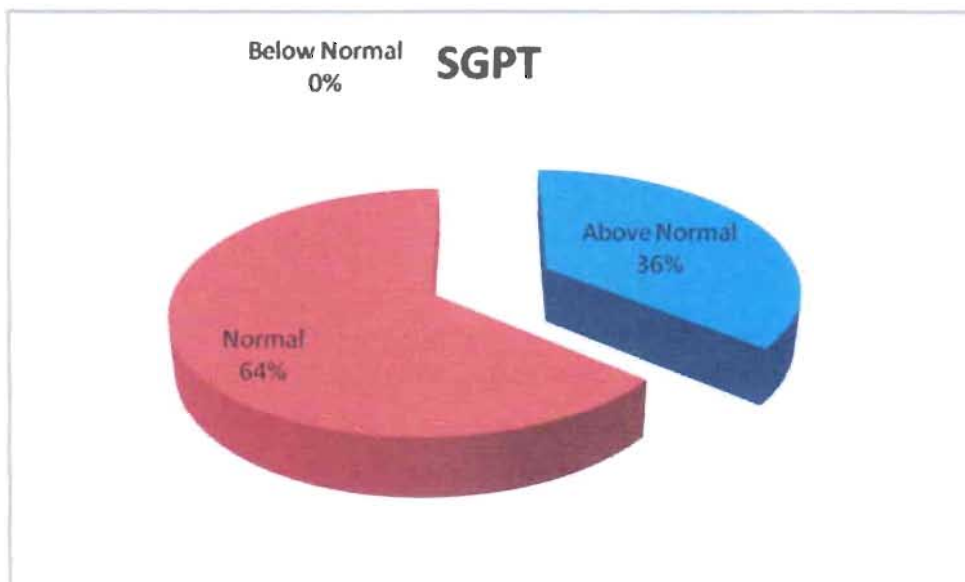


Figure 3.19.2- SGPT Data of Colorectal Cancer Patients

In the Table 3.19.2 and Figure 3.19.2, we see that 64% of the patients have SGPT in normal Stage. And 36% of the patients have SGPT above normal stage.

3.1.19.3 Serum Creatinine Data of Colorectal Cancer Patients

Serum Creatinine Data of Colorectal Cancer patients are given in the following Table 3.19.3 and figure 3.19.3

Table 3.19.3- Serum Creatinine Data of Colorectal Cancer Patients

Status	Number of Patients	Percentage
Above Normal	8	26.67
Normal	22	73.33
Below Normal	0	0

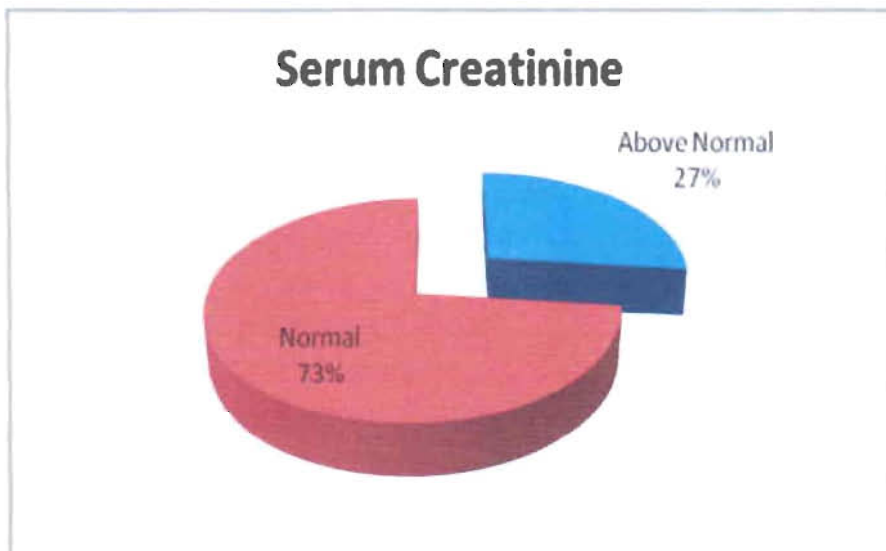


Figure 3.19.3- Serum creatinine Data of Colorectal Cancer Patients

In the Table 3.19.3 and Figure 3.19.3, we see that 73% of the patients have Serum Creatinine in normal Stage. And 27% of the patients have Serum Creatinine above normal stage.

3.1.19.3 Albumin Data of Colorectal Cancer Patients

Albumin Data of Colorectal Cancer patients are given in the following Table 3.19.4 and figure 3.19.4

Table 3.19.4- Albumin Data of Colorectal Cancer Patients

Status	Number of Patients	Percentage
Above Normal	0	0
Normal	15	75
Below Normal	5	25

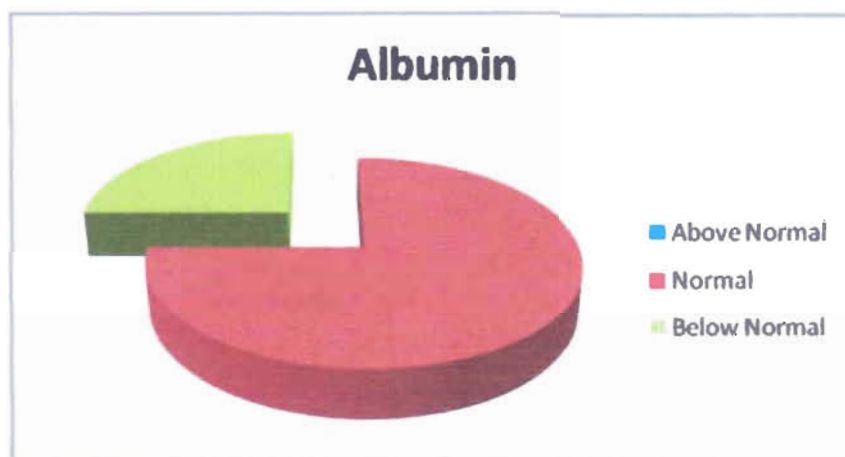


Figure 3.19.4- Albumin Data of Colorectal Cancer Patients

In the Table 3.19.4 and Figure 3.19.4, we see that 75% of the patients have Albumin in normal Stage. And 25% of the patients have Albumin below normal stage

3.1.20 Treatment Pattern of Colorectal Cancer Patients

Treatment pattern of Colorectal Cancer patients are presented in the following table 3.20.

Table 3.20- Treatment pattern of Colorectal Cancer Patients

Treatment	Number of Patients	Prevalence (%)
Surgery	25	52.5
Chemotherapy	19	40
Radiotherapy	4	10
Adjuvant Chemotherapy	2	5
Immunotherapy	0	0
Palliative chemotherapy	9	22.5

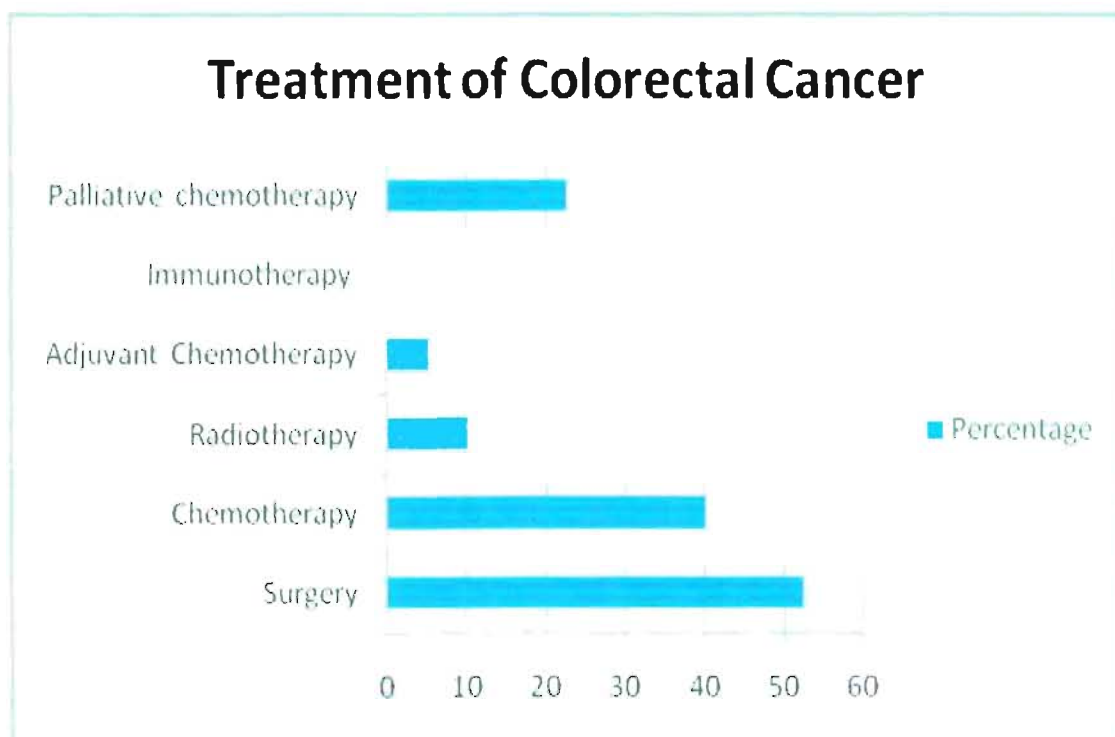


Figure 3.20- Treatment pattern of Colorectal Cancer Patients

From the Table 3.20 and Figure 3.20, we see that, the most applied treatment for Colorectal cancer is Surgery (52.5%). The second most applied treatment is Chemotherapy (40%) followed by Palliative Chemotherapy (22.5%) and Radiotherapy (10%).

3.1.21 Drug used to treat Colorectal Cancer

Table 3.21- List of Medicament that doctors applied to treat Colorectal Cancer.

Oxalitin	23	57.5
5-Fluoro Uracil	30	75
Leukoverine	19	47.5
Dexamithasone	4	10
Ranitidine	9	22.5
Esomeprazole	4	10
Vitamin B Complex	12	30
Cisplatin	3	7.5
Others	20	50

3.1.22 Recurrence Phenomena of Colorectal cancer

Recurrence Phenomena of Colorectal Cancer are presented in the following table 3.23.

Table 3.22- Recurrence Phenomena of Colorectal Cancer Patients

Status	Number of Patients	Percentage
Yes	10	25
No	30	75

Recurrence of Colorectal Cancer

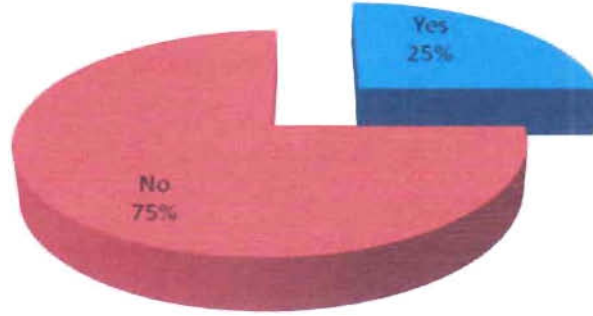


Figure 3.21- Recurrence Phenomena of Colorectal Cancer Patients

From this Table-3.22 and Figure3.21, we see that the Recurrence rate of Colorectal Cancer is only 25% where 75% cases are not recurrent.

3.1.23 Side Effects of Colorectal cancer treatment

Side Effects of Colorectal Cancer treatment are presented in the following table 3.24.

Table 3.23- Side Effects of Colorectal Cancer Treatment

Side Effects	Number of Patient	Percentage
Nausea	17	42.5
Vomiting	1	2.5
Fatigue	13	32.5
Bloody stool	2	5
Alopecia	18	45
Infection	7	17.5
Change in skin	14	35
Poor appetite	5	12.5
Diarrhea	11	27.5
Mouth & lip sore	15	37.5
Chills	8	20
Weakness	21	52.5
Fever	11	27.5
Bleeding	2	5
Watery Eye	1	2.5

Neuropathy	4	10
Skin Cracking	2	5
Taste Change	1	2.5
Hyper Pigmentation	1	2.5
Discoloration of Veins	1	2.5

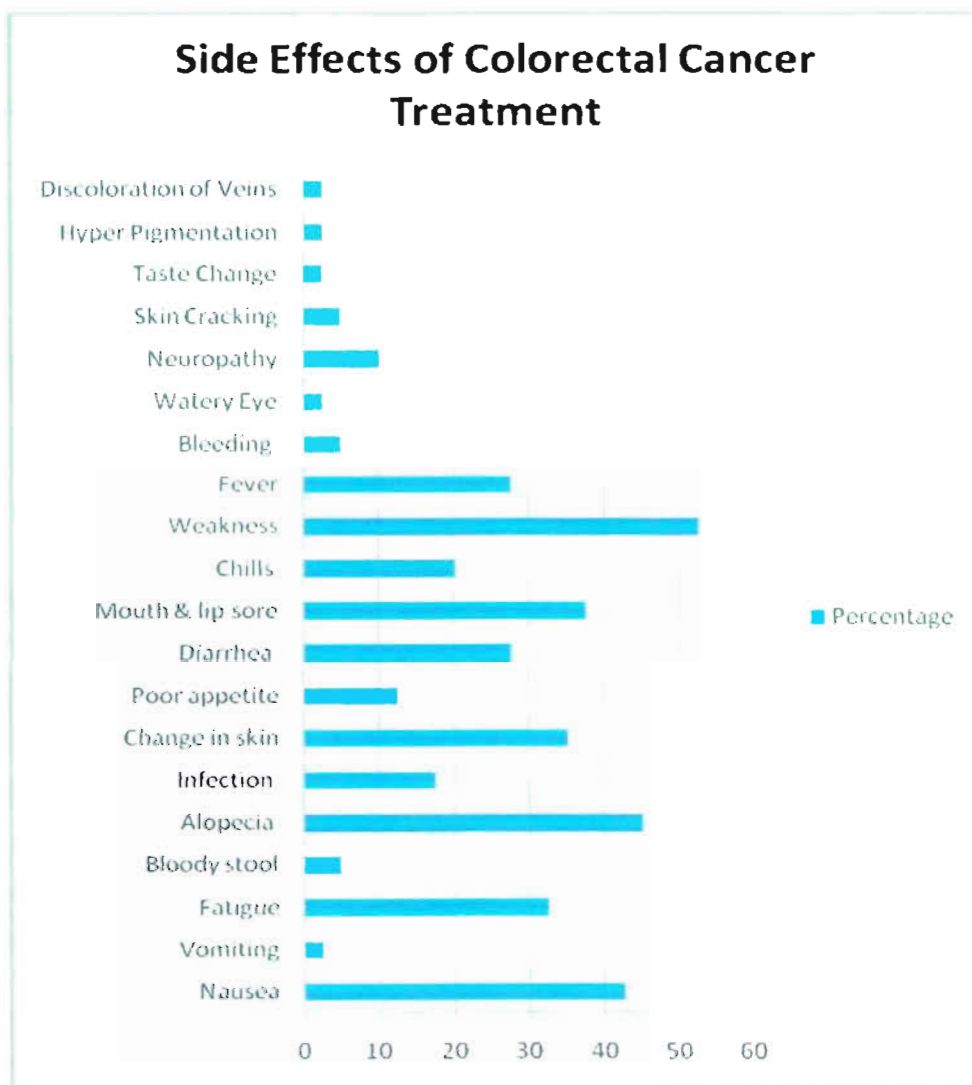


Figure 3.22- Side Effects of Colorectal Cancer treatment

From the Table 3.23 and Figure 3.22, we see that The most frequent side effect of **Colorectal Cancer** treatment is **Weakness (52.5%)** followed by **Alopecia (45%)**.



CHAPTER 04: DISCUSSION & CONCLUSION

4. Discussion and Conclusion

4.1 Discussion

In our study, 40 persons were observed. Among them, 62.5% of Colorectal Cancer patients were male and 32.50% colorectal Cancer patients were female. That concluded that the chances of occurrence of colorectal cancer are greater in Male than in Female.

From our observation we also found that, that the prevalence of married Colorectal Cancer patient was 85% where as the Unmarried patients were only 15%.

We also had an investigation about the age distribution and we found that the most significant portion (27.5%) of patients affected was in the age range between 51-60 years. And the second largest portion (25%) affected patients was in the age range between 21-30 years. And the third largest portion (20%) affected patients was in between 41 and 50 years of age.

Among the patient we observed, a higher percentage of patients who lived in rural area (47.5%) lived in rural is affected by Colorectal Cancer and a higher percentage (50%) of patients who are poor was affected by colorectal cancer.

Among the patients under study, 50% of the patients were non-smoker where 38% of the of the patients were ex-smoker (Quit smoking less than 6 months ago) and 12% of the patients were current smoker. It was also seen that it was seen that the Higher percentage (25%) of the people were HSC or Equivalent. The percentages (25%) of the people were Graduate. The percentage of illiterate patients was 12.5%. 100% of the patients were Bangladeshi and they are from different parts of Bangladesh.

We also checked some Biophysical properties of the patient we studied. To check the occurrence of Colorectal Cancer in particular height range, we found that the height between 5'-0" to 5'-3" are most affected by Colorectal Cancer (40%) followed by the patient having height between 5'-3"-5'-6" (37.5%). After checking the pulse rate we found that a higher percentage (55%) of Colorectal Cancer patients have normal pulse rates. Rest of the patients

have abnormal pulse rates. Among them 40% patients have above normal pulse rates and 5% patients have pulse rate below normal rate.

We also tried to correlate the body weight with the occurrence of Colorectal Cancer and we found that a higher percentage of body weight (60%) of the Colorectal patients were between 41 KG and 45. (Before treatment) again a higher percentage of body weight (45%) of the colorectal patients were between 31 KG and 35. (After treatment).

We also observed that among the 40 patients, 75% of Colorectal Patients were out-patients (All are from National Cancer Research Institute and Hospital) and 25% were In-patients (All are from Bangabandhu Sheikh Mujib Medical University). Among the In-patients, the higher percentage of Length of Hospital stay (25%) for the Colorectal Cancer patient was between 7 and 14 days.

We observed that the higher percentage of the Colorectal Cancer patients (40%) is suffering from Stage-I Colorectal Cancer.

We also tried to find out the prime risk factors of Colorectal Cancer and we found that Diet (having Low fruit and Vegetable) the higher percentage of Risk factor (67.5%) followed by Polyps (57.5%).

While we checked frequently occurred signs and symptoms we found that there was a variation of signs and Symptoms of Colorectal cancer among the patients. The higher percentage of the Symptom (67.5%) was Blood in the stool having a bright red or very dark color).

We observed a variation of Diagnostic test for Colorectal Cancer. We saw that, the most observed test for diagnose Colorectal cancer is Fecal Occult Blood Test (55%). The second most observed diagnostic test is Ultrasonography (50%) followed by Digital Rectal Exam (45%) or Colonoscopy (32.5%) on the basis of the nature of the Cancer whether it is Colon Cancer or Rectal cancer.

We also observed some Biochemical tests and Hematological data of the Colorectal Cancer patients. We found that 63% of the patients have Hemoglobin below normal Stage. 63% of the patients have ESR below normal Stage. And 25% of the patients have ESR above

normal stage. 50% of the patients have Total WBC count below normal Stage. And 25% of the patients have Total WBC count above normal stage. 67% of the patients have Total WBC count below normal Stage. And 13% of the patients have Total WBC count above normal stage. 50% of the patients have Carcinoembryonic Antigen (CEA) below normal Stage. And 50% of the patients have Carcinoembryonic Antigen (CEA) in normal stage. While checking the Biochemical test data we found that 78% of the patients have Bilirubin in normal Stage. And 22% of the patients have Bilirubin above normal stage. 64% of the patients have SGPT in normal Stage. And 36% of the patients have SGPT above normal stage. 73% of the patients have Serum Creatinine in normal Stage. And 27% of the patients have Serum Creatinine above normal stage. 75% of the patients have Albumin in normal Stage. And 25% of the patients have Albumin below normal stage

We also observed the treatment pattern of Colorectal Cancer. We found that the most applied treatment for Colorectal cancer is Surgery (52.5%). The second most applied treatment is Chemotherapy (40%) followed by Palliative Chemotherapy (22.5%) and Radiotherapy (10%).

We found a variety of treatment pattern to treat the colorectal cancer patients such as Surgery (52.5%), Chemotherapy (40%) and Palliative Chemotherapy for the patients (with Stage-IV Colorectal cancer). Among the Chemotherapeutic agents Oxalitin and Leukovarine were frequently used and percentages for the both drugs were 57.5% and 47.5 respectively. Vitamin B Complex was prescribed to the 30% patients who suffered from Lip and Mouth sore due to the side effect of Chemotherapy.

While observing the Side effect of the Colorectal Cancer treatment we found that the most frequent side effect of Colorectal Cancer treatment is Weakness (52.5%) followed by Alopecia (45%).

We also investigated the recurrence Phenomena of Colorectal Cancer and we saw that the recurrence rate of Colorectal Cancer is only 25% where 75% cases are not recurrent.

4.2 Conclusion

From our study, we found various important data regarding the prevalence and treatment of colorectal cancer. During this study we also found some discreet facts, for example, patient having less than 35 KG body weight before treat were advised to increase their body were before starting the treatment. Again, patients having stage II colorectal cancer given adjuvant chemotherapy after surgery. Currently, the flow of colorectal cancer into the hospitals is increasing. Therefore, this research work will be a helpful tool for the doctors and clinicians to make future decisions.

CHAPTER 05: REFERENCES

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