COLORECTAL CANCER IN BANGLADESH: DEMOGRAPHIC DETAILS, RISK FACTORS, DIAGNOSIS & TREATMENT PATTERNS.

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

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ID: 2005-2-70-049

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Date: 07th December, 2010.

This research paper is dedicated

to my parents.

Certificate

This research paper is submitted to the Department of Pharmacy, East West University in conformity with the requirements for the degree of Bachelor of Pharmacy (B. Pharm) was carried by Rasadul Hasan (ID:2005-2-70-049).

Sufia Islam 19.12.2010

Dr. SUFIA ISLAM

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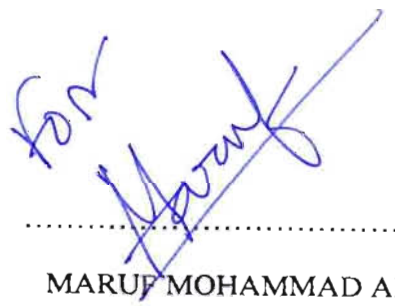
Certificate

This is to certify that the thesis "COLORECTAL CANCER IN BANGLADESH: DEMOGRAPIC DETAILS, RISK FACTORS, DIAGNOSIS & TREATMENT PATTERNS" 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 Rasadul Hasan (ID: 2005-2-70-049) 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 the 3rd most common cancer in both male & female in the world. Colorectal patients are also increasing in Bangladesh. In our study it was found that out of 31 patients 87.1% were male & 12.9% were female. Most of the patients (32.26%) were in age range between 31-40 years & 83.87% were married. It was observed that 90.32% patients were Muslim & 48.38% were coming from sub-urban area. Most of the patients were S.S.C. or less (41.94%) educated & 58.06% patients were coming from lower middle class family where as 45.16% patients were non-smoker. It was found that Stage I patients were 77.42% & 100% patients had hepatic & renal abnormality. Most of them were loss weights (83.9%) & 61.29% of patients skin color were changed after affecting colorectal cancer. In all case (100%) patients were diagnosis by Digital rectal exam (DRE), Fecal occult blood test (FOBT), Sigmoidoscopy & Colonoscopy. The most important risk factors were history of ulcerative colotis(28.56%), diet(25%), polyps(17.86%) etc. The sign and symptoms included decrease appetite (11.15%), feeling of incomplete defecation (11.15%), fever (10.77%), weight loss (10%) etc. The patients were treated with antipsychotic agents (46.1%), antibiotics (26.6%), antiulcerents (24.8%) & anticancer drugs (5.5%). Anticancer drugs were given only those patients who were in Stage II to Stage IV. In Bangladesh the colorectal cancer diagnosis & treatment patterns are not like as developed countries. For this cause, there are so many patients are died without diagnosis the disease. Illiteracy also helps to increase the death rate.

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CHAPTER 01: INTRODUCTION

1. Introduction

1.1. Cancer

Cancer or malignant neoplasm is a class of diseases in which a group of cells display uncontrolled growth or cell division beyond the normal limits, causes intrusion on and destruction of adjacent tissues, and sometimes metastasis (spread to other locations in the body via lymph or blood). These three malignant properties of cancers differentiate them from benign tumors, which are self-limited, and do not invade or metastasize. Most cancers form a tumor but some, like leukemia, do not. The branch of medicine concerned with the study, diagnosis, treatment, and prevention of cancer is oncology. [1] Cancer affects people at all ages with the risk for most types increasing with age. [2] Cancer caused about 13% of all human deaths in 2007 (7.6 million) [3].

1.2. History

- The oldest known description and surgical treatment of cancer was discovered in Egypt and dates back to approximately 1600 B.C. by Papyrus. [4]
- Galen used "oncos" to describe all tumours, the root for the modern word oncology. [5]
- Hippocrates described several kinds of cancers. He called benign tumours oncos, Greek for swelling, and malignant tumours carcinos. He later added the suffix -oma, Greek for swelling, giving the name carcinoma. [6]
- Another very early surgical treatment for cancer was described in the 1020s by Avicenna (Ibn Sina) in "The Canon of Medicine". He stated that the excision should be radical and that all diseased tissue should be removed, which included the use of amputation or the removal of veins running in the direction of the tumor. He also recommended the use of cauterization for the area treated if necessary. [7]
- In the 16th and 17th centuries, it became more acceptable for doctors to dissect bodies to discover the cause of death. The first cause of cancer was identified by British surgeon Percivall Pott, who discovered in 1775 that cancer of the scrotum was a common disease among chimney sweeps. [8]

- In the 19th century, asepsis improved surgical hygiene and as the survival statistics went up, surgical removal of the tumor became the primary treatment for cancer.
- The genetic basis of cancer was recognised in 1902 by the German zoologist Theodor Boveri, professor of zoology at Munich and later in Würzburg.
- When Marie Curie and Pierre Curie discovered radiation at the end of the 19th century, they stumbled upon the first effective non-surgical cancer treatment. [9]
- Since World War II, trends in cancer treatment are to improve on a micro-level the existing treatment methods, standardize them, and globalize them to find cures through epidemiology and international partnerships. [10]

1.3. Epidemiology

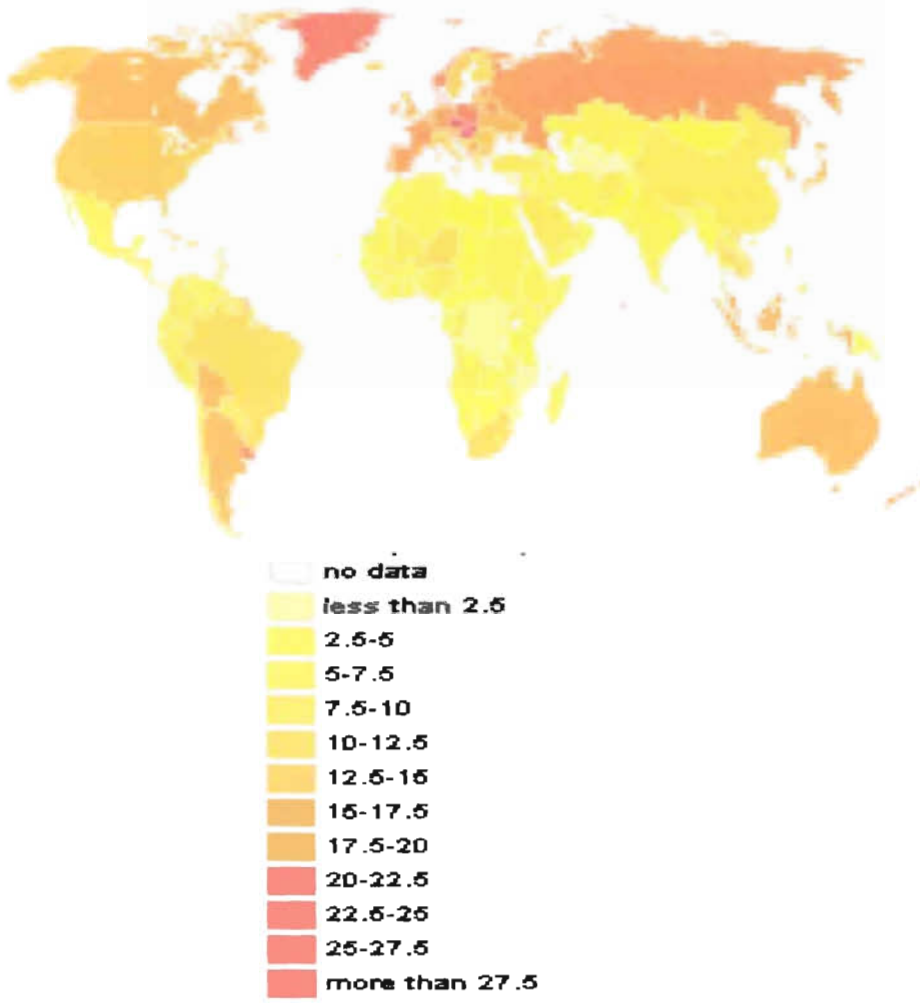


Figure1. Death rate from colorectal cancer per 100000 inhabitants in 2004

As of 2004, worldwide cancer caused 13% of all deaths (
causes were: lung cancer (1.3 million deaths/year), stomach cancer (803,000 deaths), colorectal cancer (639,000 deaths) [12], liver cancer (610,000 deaths), and breast cancer (519,000 deaths). Greater than 30% of cancer is preventable via avoiding risk factors including: tobacco, overweight or obesity, low fruit and vegetable intake, physical inactivity, alcohol, sexually transmitted infections, and air pollution. [13]

In the United States, cancer is responsible for 25% of all deaths with 30% of these from lung cancer. The most commonly occurring cancer in men is prostate cancer (about 25%) and in women is breast cancer (about 25%). Cancer can occur in children and adolescents, but it is uncommon (about 150 cases per million in the U.S.), with leukemia the most common.[14] In the first year of life the incidence is about 230 cases per million in the U.S., with the most common being neuroblastoma. [15]

In the developed world, one in three people will develop cancer during their lifetimes. If all cancer patients survived and cancer occurred randomly, the lifetime odds of developing an 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.[16]

1.4. Mechanism of Cancer

Cancers are caused by a series of mutations. Each mutation alters the behavior of the cell somewhat. Cancer is fundamentally a disease of regulation of tissue growth. [42] In order for a normal cell to transform into a cancer cell, genes which regulate cell growth and differentiation must be altered. Genetic changes can occur at many levels, from gain or loss of entire chromosomes to a mutation affecting a single DNA nucleotide. There are two broad categories of genes which are affected by these changes. Oncogenes may be normal genes which are expressed at inappropriately high levels, or altered genes which have novel properties. In either case, expression of these genes promotes the malignant phenotype of cancer cells. Tumor suppressor genes are genes which inhibit cell division, survival, or other properties of cancer cells. Tumor suppressor genes are often disabled by cancer-promoting genetic changes. Typically, changes in many genes are required to transform a normal cell into a cancer cell. [43]

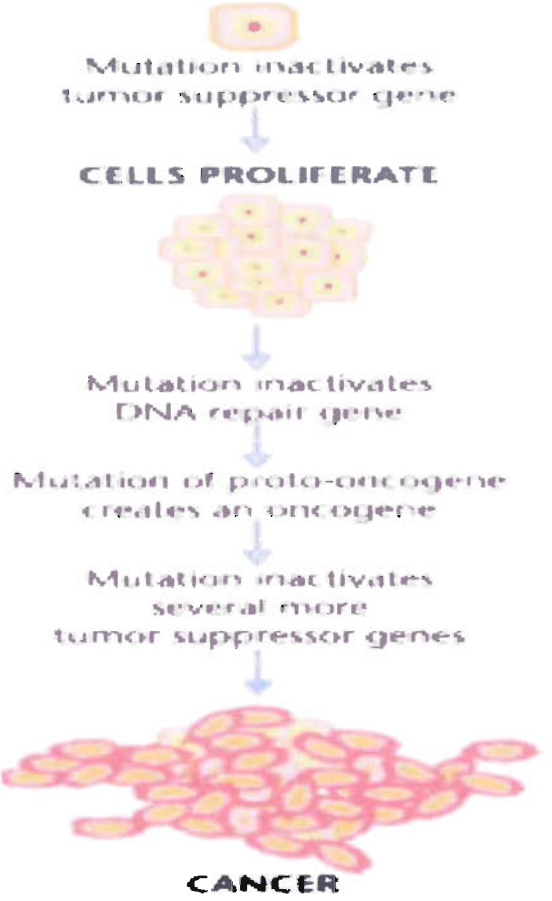


Figure2. Formation of cancer cell

1.5. Classification of Cancer

Cancer are classified according to the type of tissue in which the cancer originates and the location in the body where the cancer first developed. Examples of general categories include:

- **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.
- **Sarcoma:** Malignant tumors derived from connective tissue, or mesenchymal cells.
- **Lymphoma and leukemia**: Malignancies derived from hematopoietic (blood-forming) cells
- **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

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.

Cancers are often referred to by terms that contain a prefix related to the cell type in which the cancer originated and a suffix such as -sarcoma, -carcinoma, or just -oma. Common prefixes include: [18]

- Adeno- = gland
- Chondro- = cartilage
- Erythro- = red blood cell
- Hemangio- = blood vessels
- Hepato- = liver
- Lipo- = fat
- Lympho- = white blood cell
- Melano- = pigment cell
- Myelo- = bone marrow
- Myo- = muscle
- Osteo- = bone
- Uro- = bladder
- Retino- = eye
- Neuro- = brain

1.6. Symptoms

Symptoms of cancer metastasis depend on the location of the tumor. [19]Cancer symptoms can be divided into three groups:

- **Local symptoms:**
  - Unusual lumps or swelling (tumor),
  - Hemorrhage (bleeding),
  - Pain
  - And/or ulceration.
  - Compression of surrounding tissues may cause symptoms such as jaundice.

- **Symptoms of metastasis (spreading):**
  - Enlarged lymph nodes, cough and hemoptysis,
  - Hepatomegaly (enlarged liver),
  - Bone pain,
  - Fracture of affected bones and
  - Neurological symptoms. [20]
  - Although advanced cancer may cause pain, it is often not the first symptom.
- **Systemic symptoms:**
  - Weight loss,
  - Poor appetite,
  - Fatigue and cachexia (wasting),
  - Excessive sweating (night sweats),
  - Anemia and specific paraneoplastic phenomena, [21] i.e. specific conditions that are due to an active cancer, such as thrombosis or hormonal changes.

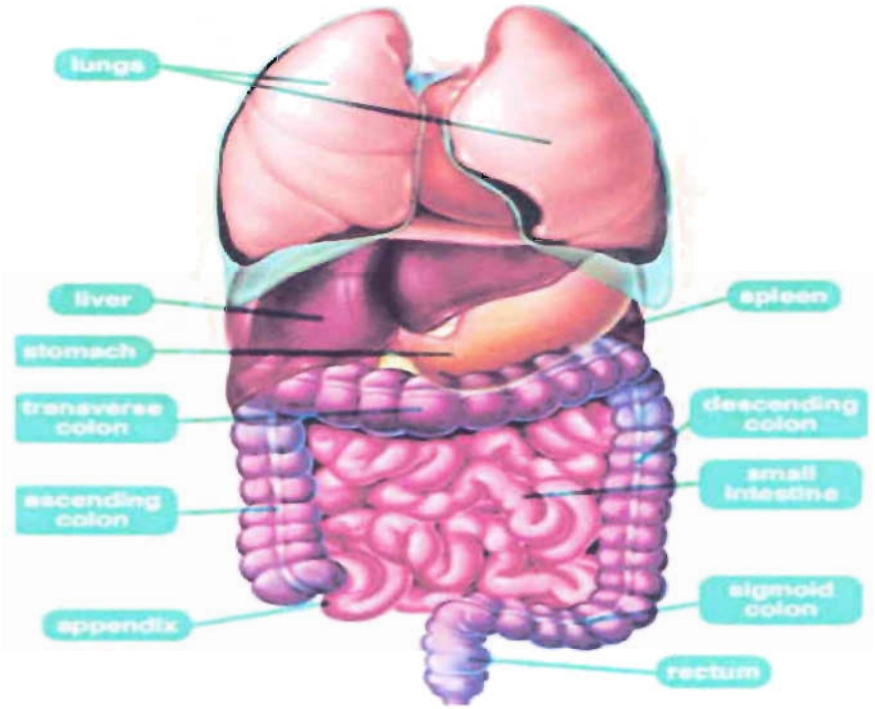


Figure 3. Common sites of cancer metastasis

1.7. Cancer risk factors

Cancer is a group of more than 100 different diseases, [20] each with their own set of risk factors. The risk of developing cancer increases as we age, so age along with gender, race and personal and family medical history, are risk factors for cancer. Other risk factors are largely related to lifestyle choices, while certain infections, occupational exposures and some environmental factors can also be related to developing cancer. [21]

Table 1.Risk factors for several types of cancer

Sites	Risk factors
Lung, Larynx	Tobacco smoking
Oral cavity	Tobacco chewing
Pharynx	Air pollution and chemicals: Asbestos (Lung)
Oesophagus	Poor dental care and oral hygiene (oral cavity)
Pancreas	Excessive intake of red chilli (oesophagus)
Kidney, Bladder	Early sex, early marriage, multiple sex partners, multiple pregnancies, low socio-economic status, poor personal hygiene, venereal diseases
Cervix	HSV-2, HPV, Uncircumcised male partner, nulliparous
Breast	Daughters of breast cancer patients, less breast feeding, high fatty food, alcohol drinking (+tobacco smoking)
Liver	HBV
Stomach	High fatty food
Colo-rectum	Low fibrous food, low Vitamin A,C,E, and Selenium, Zinc in food
Penis	Uncircumcised male organ
Brain	Tobacco smoking, alcohol drinking
Thyroid	Ionizing radiation

1.8. Cancer situation in Bangladesh

Cancer has been appearing as an important public health problem in Bangladesh. Due to the lack of reporting system and under-diagnosis of cancer, the real situation is unknown yet. Population-based data on cancer are sparse. A recent WHO study estimated that 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). [22]

The same study observed that 3.6% of the admissions in medical college hospitals for the same age group are 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. These three cancers constitute 37% of all cancers irrespective sexes. [23]

1.9. Cancer of the colon and rectum

The colon is the part of the digestive system where the waste material is stored. The rectum is the end of the colon adjacent to the anus. Together, they form a long, muscular tube called the large intestine (also known as the large bowel). Tumors of the colon and rectum are growths arising from the inner wall of the large intestine. Benign tumors of the large intestine are called polyps. Malignant tumors of the large intestine are called cancers. Benign polyps do not invade nearby tissue or spread to other parts of the body. Benign polyps can be easily removed during colonoscopy and are not life-threatening. If benign polyps are not removed from the large intestine, they can become malignant (cancerous) over time. Most of the cancers of the large intestine are believed to have developed from polyps. [24] Cancer of the colon and rectum (also referred to as colorectal cancer) can invade and damage adjacent tissues and organs. Cancer cells can also break away and spread to other parts of the body (such as liver and lung) where new tumors form. The spread of colon cancer to distant organs is called metastasis of the colon cancer. Once metastasis has occurred in colorectal cancer, a complete cure of the cancer is unlikely.

Globally, cancer of the colon and rectum is the third leading cause of cancer in males and the fourth leading cause of cancer in females. The frequency of colorectal cancer varies around the world. It is common in the Western world and is rare in Asia and Africa. In countries where the people have adopted western diets, the incidence of colorectal cancer is increasing.

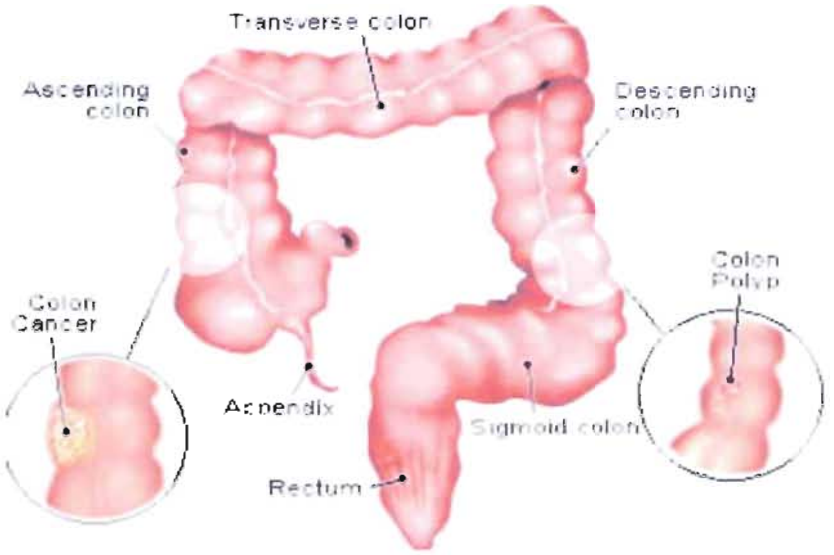


Figure 4. Colon cancer and polyps

1.10. Risk factors of colorectal cancer

Doctors are certain that colorectal cancer is not contagious (a person cannot catch the disease from a cancer patient). Some people are more likely to develop colorectal cancer than others. Factors that increase a person's risk of colorectal cancer include high fat intake, a family history of colorectal cancer and polyps, [25] the presence of polyps in the large intestine and chronic ulcerative colitis.

1.10.1. Colon polyps

Most colon cancers develop in colon polyps. Removing benign colon polyps can prevent colorectal cancer. Colon polyps develop when chromosome damage occurs in cells of the inner lining of the colon. Chromosomes contain genetic information inherited from each parent. Normally, healthy chromosomes control the growth of cells in an orderly manner. When chromosomes are damaged, cell growth becomes uncontrolled, resulting in masses of extra tissue (polyps). [27] Colon polyps are initially benign. Over years, benign colon polyps can acquire additional chromosome damage to become cancerous.

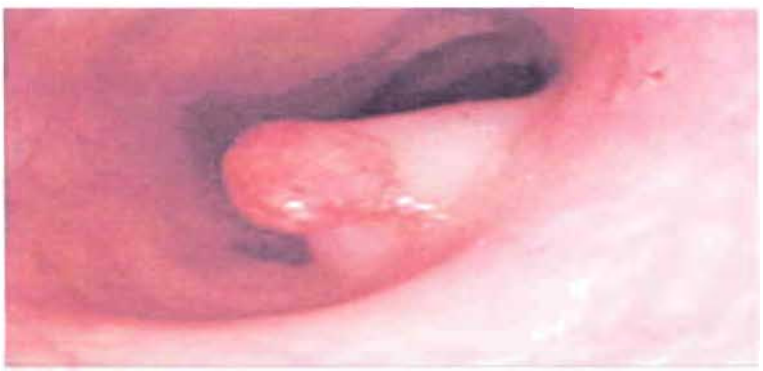


Figure 5. Colon polyps

1.10.2. Diet

Diets high in fat are believed to predispose humans to colorectal cancer. In countries with high colorectal cancer rates, the fat intake by the population is much higher than in countries with low cancer rates. It is believed that the breakdown products of fat metabolism lead to the formation of cancer-causing chemicals (carcinogens). [26] Diets high in vegetables and high-fiber foods such as whole-grain breads and cereals may rid the bowel of these carcinogens and help reduce the risk of cancer.

1.10.3. Ulcerative colitis

Chronic ulcerative colitis causes inflammation of the inner lining of the colon. Colon cancer is a recognized complication of chronic ulcerative colitis. The risk for cancer begins to rise after eight to 10 years of colitis. The risk of developing colon cancer in a patient with ulcerative colitis also is related to the location and the extent of his or her disease.

Current estimates of the cumulative incidence of colon cancer associated with ulcerative colitis are 2.5% at 10 years, 7.6% at 30 years, and 10.8% at 50 years. [28] Patients at higher risk of cancer are those with a family history of colon cancer, a long duration of colitis, extensive colon involvement and those with primary sclerosing cholangitis (PSC).

Since the cancers associated with ulcerative colitis have a more favorable outcome when caught at an earlier stage, yearly examinations of the colon often are recommended after eight years of known extensive disease. During these examinations, samples of tissue (biopsies) can be taken to search for precancerous changes in the lining cells of the colon. When precancerous changes are found, removal of the colon may be necessary to prevent colon cancer.

1.10.4. Genetics

A person's genetic background is an important factor in colon cancer risk. Among first-degree relatives of colon cancer patients, the lifetime risk of developing colon cancer is 18%. Even though family history of colon cancer is an important risk factor, majority (80%) of colon cancers occur sporadically in patients with no family history of colon cancer. [29] Approximately 20% of cancers are associated with a family history of colon cancer. And 5 % of colon cancers are due to hereditary colon cancer syndromes. [30] Hereditary colon caner syndromes are disorders where affected family members have inherited cancer-causing genetic defects from one or both of the parents.

Chromosomes contain genetic information and chromosome damages cause genetic defects that lead to the formation of colon polyps and later colon cancer. In sporadic polyps and cancers (polyps and cancers that develop in the absence of family history), the chromosome damages are acquired (develop in a cell during adult life). The damaged chromosomes can only be found in the polyps and the cancers that develop from that cell. But in hereditary colon cancer syndromes, the chromosome defects are inherited at birth and are present in every cell in the body. Patients who have inherited the hereditary colon cancer syndrome genes are at risk of developing large number of colon polyps, usually at young ages and are at very high risk of developing colon cancer early in life and also are at risk of developing cancers in other organs. [31]

- FAP (familial adenomatous polyposis) is a hereditary colon cancer syndrome where the affected family members will develop countless numbers (hundreds, sometimes thousands) of colon polyps starting during the teens. Unless the condition is detected and treated (treatment involves removal of the colon) early, a person affected by familial polyposis syndrome is almost sure to develop colon cancer from these polyps. Cancers usually develop in the 40s. [32] These patients are also at risk of developing other cancers such as cancers in the thyroid gland, stomach etc.
- AFAP (attenuated familial adenomatous polyposis) is a milder version of FAP. Affected members develop less than 100 colon polyps. Nevertheless, they are still at very high risk of developing colon cancers at young ages. They are also at risk of having gastric polyps and duodenal polyps.
- HNPCC (hereditary nonpolyposis colon cancer) is a hereditary colon cancer syndrome where affected family members can develop colon polyps and cancers, usually in the right colon, in their 30s to 40s. Certain HNPCC patients are also at risk of developing uterine cancer, stomach cancer, ovarian cancer, and cancers of the ureters (the tubes that connect the kidneys to the bladder), and the biliary tract (the ducts that drain bile from the liver to the intestines).
- MYH polyposis syndrome is a recently discovered hereditary colon cancer syndrome. Affected members typically develop 10-100 polyps occurring at around 40 years of age, [33] and are at high risk of developing colon cancer.

1.11. Symptoms of colon cancer

Symptoms of colon cancer are numerous and nonspecific. They include-

- Fatigue,
- Weakness,
- Shortness of breath,
- Change in bowel habits,
- Narrow stools,
- Diarrhea or constipation,
- Red or dark blood in stool,
- Weight loss,
- Abdominal pain,
- Cramps or bloating.
- Other conditions such as irritable bowel syndrome, ulcerative colitis, Crohn's disease, diverticulosis, and peptic ulcer disease can have symptoms that mimic colorectal cancer. [34]

Colon cancer can be present for several years before symptoms develop. [35] Symptoms vary according to where in the large bowel the tumor is located.

1.12. Staging

The stage describes the extent of the cancer in the body. It is based on how far the cancer has grown into the wall of the intestine, whether or not it has reached nearby structures, and whether or not it has spread to the lymph nodes or distant organs. [37] The stage of a cancer is one of the most important factors in determining prognosis and treatment options. Staging is the process of finding out how far a cancer has spread. It is based on the results of the physical exam, biopsies and imaging tests (CT or MRI scan, x-rays, PET scan, etc.).

The stage is expressed in Roman numerals from stage 0 (the least advanced) to stage IV (the most advanced). Those are

- Stage 0: The cancer is in the earliest stage. It has not grown beyond the inner layer (mucosa) of the colon or rectum. This stage is also known as carcinoma in situ or intramucosal carcinoma.
- Stage I: Cancer is confined to the lining of the colon.
- Stage II: Cancer may penetrate the wall of the colon into the abdominal cavity or other adjacent organs but does not invade any local lymph nodes.

- Stage III: Cancer invades one or more of the local lymph nodes but has not spread to other distant organs.
- Stage IV: Cancer has spread to distant locations in the body, which may include the liver, lungs, bones or other sites. [38]

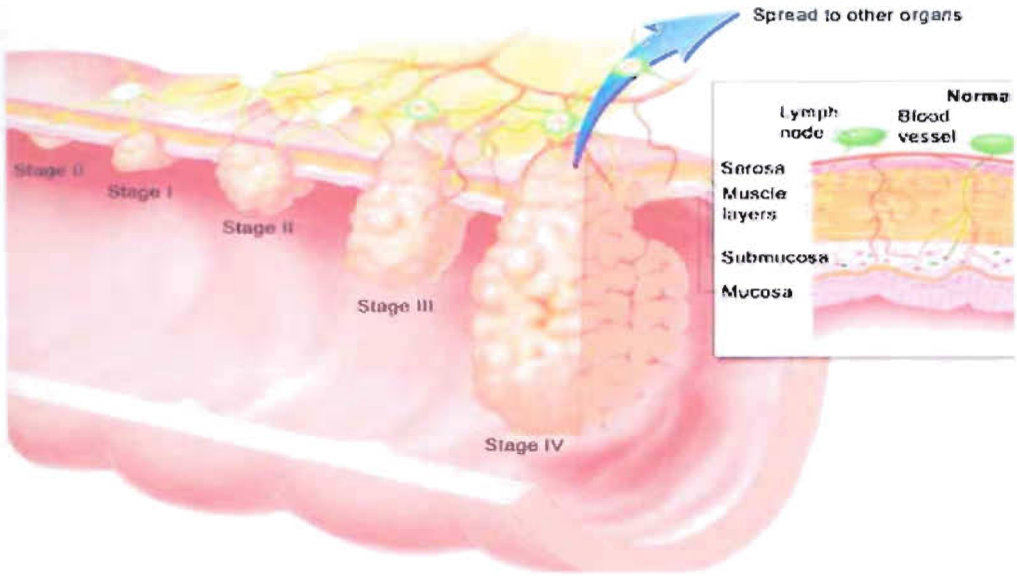


Figure 6. Different stage of colon cancer

1.13. Detection

When colon cancer is suspected, either a lower GI series (barium enema x-ray) or colonoscopy is performed to confirm the diagnosis and to localize the tumor.

A barium enema involves taking x-rays of the colon and the rectum after the patient is given an enema with white, chalky liquid containing barium. [35] The barium outlines the large intestines on the x-rays. Tumors and other abnormalities appear as dark shadows on the x-rays.

Colonoscopy is a procedure whereby a doctor inserts a long, flexible viewing tube into the rectum for the purpose of inspecting the inside of the entire colon. Colonoscopy is generally considered more accurate than barium enema x-rays, especially in detecting small polyps. If colon polyps are found, they are usually removed through the colonoscope and sent to the pathologist. The pathologist examines the polyps under the microscope to check for cancer. While the majority of the polyps removed through the colonoscopes are benign, many are precancerous. Removal of precancerous polyps prevents the future development of colon cancer from these polyps.

If cancerous growths are found during colonoscopy, small tissue samples (biopsies) can be obtained and examined under the microscope to confirm the diagnosis. If colon cancer is confirmed by a biopsy, staging examinations are performed to determine whether the cancer has already spread to other organs. Since colorectal cancer tends to spread to the lungs and the liver, staging tests usually include chest x-rays, ultrasonography, or a CAT scan of the lungs, liver, and abdomen.

Sometimes, the doctor may obtain a blood test for CEA (carcinoembyonic antigen). CEA is a substance produced by some cancer cells. It is sometimes found in high levels in patients with colorectal cancer, especially when the disease has spread.

1.13.1. Diagnosis

Colorectal cancer can take many years to develop and early detection of colorectal cancer greatly improves the chances of a cure. The National Cancer Policy Board of the Institute of Medicine estimated in 2003 that even modest efforts to implement colorectal cancer screening methods would result in a 29 percent drop in cancer deaths in 20 years. Despite this, colorectal cancer screening rates remain low.[39] Therefore, screening for the disease is recommended in individuals who are at increased risk. There are several different tests available for this purpose.

- Digital rectal exam (DRE): The doctor inserts a lubricated, gloved finger into the rectum to feel for abnormal areas. It only detects tumors large enough to be felt in the distal part of the rectum but is useful as an initial screening test.
- Fecal occult blood test (FOBT): A test for blood in the stool. Two types of tests can be used for detecting occult blood in stools i.e. guaiac based (chemical test) and immunochemical. The sensitivity of immunochemical testing is superior to that of chemical testing without an unacceptable reduction in specifity.[40]
- Endoscopy:
    1. Sigmoidoscopy: A lighted probe (sigmoidoscope) is inserted into the rectum and lower colon to check for polyps and other abnormalities.
    2. Colonoscopy: A lighted probe called a colonoscope is inserted into the rectum and the entire colon to look for polyps and other abnormalities that may be caused by cancer. A colonoscopy has the advantage that if polyps are found during the procedure they can be removed immediately. Tissue can also be taken for biopsy.

1.13.2. Other screening methods

- Double contrast barium enema (DCBE): First cleaning the colon and an enema containing barium sulfate is administered. Then air is insufflated into the colon, distending it. The result is a thin layer of barium over the inner lining of the colon which is visible on X-ray films. A cancer or a precancerous polyp can be detected this way. This technique can miss the (less common) flat polyp.
- Virtual colonoscopy replaces X-ray films in the double contrast barium enema (above) with a special computed tomography scan and requires special workstation software in order for the radiologist to interpret. This technique is approaching colonoscopy in sensitivity for polyps. However, any polyps found must still be removed by standard colonoscopy.
- Standard computed axial tomography is an x-ray method that can be used to determine the degree of spread of cancer, but is not sensitive enough to use for screening. Some cancers are found in CAT scans performed for other reasons.
- Blood tests: Measurement of the patient's blood for elevated levels of certain proteins can give an indication of tumor load. In particular, high levels of carcinoembryonic antigen (CEA) in the blood can indicate metastasis of adenocarcinoma. These tests are frequently false positive or false negative and are not recommended for screening.
- Genetic counseling and genetic testing for families who may have a hereditary form of colon cancer, such as hereditary nonpolyposis colorectal cancer (HNPCC) or familial adenomatous polyposis (FAP).
- Whole-body PET imaging is the most accurate diagnostic test for detection of recurrent colorectal cancer and is a cost-effective way to differentiate resectable from nonresectable disease. A PET scan is indicated a major management decision depends upon accurate evaluation of tumour presence and extent.
- Stool DNA testing is an emerging technology in screening for colorectal cancer. Premalignant adenomas and cancers shed DNA markers from their cells which are not degraded during the digestive process and remain stable in the stool. Capture, followed by PCR amplifies the DNA to detectable levels for assay. Clinical studies have shown a cancer detection sensitivity of 71%–91%.[41]
- High C - reactive protein levels are risk marker. [40]

1.13.3. Monitoring

Carcinoembryonic antigen (CEA) is a protein found on virtually all colorectal tumors. CEA may be used to monitor and assess response to treatment in patients with metastatic disease. CEA can also be used to monitor recurrence in patients post-operatively.

1.14. Prevention

Unfortunately, colon cancers can be well advanced before they are detected. The most effective prevention of colon cancer is early detection and removal of precancerous colon polyps before they turn cancerous. [42] Even in cases where cancer has already developed, early detection still significantly improves the chances of a cure by surgically removing the cancer before the disease spreads to other organs. Multiple world health organizations have suggested general screening guidelines.

1.14.1. Digital rectal examination and stool occult blood testing

It is recommended that all individuals over the age of 40 have yearly digital examinations of the rectum and their stool tested for hidden or "occult" blood. During digital examination of the rectum, the doctor inserts a gloved finger into the rectum to feel for abnormal growths. Stool samples can be obtained to test for occult blood. The prostate gland can be examined at the same time.

An important screening test for colorectal cancers and polyps is the stool occult blood test. Tumors of the colon and rectum tend to bleed slowly into the stool. The small amount of blood mixed into the stool is usually not visible to the naked eye. The commonly used stool occult blood tests rely on chemical color conversions to detect microscopic amounts of blood. These tests are both convenient and inexpensive. A small amount of stool sample is smeared on a special card for occult blood testing. Usually, three consecutive stool cards are collected. A person who tests positive for stool occult blood has a 30% to 45% chance of having a colon polyp and a 3% to 5% chance of having a colon cancer. [43]

It is important to remember that having stool tested positive for occult blood does not necessarily mean the person has colon cancer. Many other conditions can cause occult blood in the stool. However, patients with a positive stool occult blood should undergo further evaluations involving barium enema x-rays, colonoscopies and other tests to exclude colon cancer and to explain the source of the bleeding. It is also important to realize that stool which has tested negative for occult blood does not mean the absence of

colorectal cancer or polyps. Even under ideal testing conditions, at least 20% of colon cancers can be missed by stool occult blood screening. Many patients with colon polyps are tested negative for stool occult blood. In patients suspected of having colon tumors and in those with high risk factors for developing colorectal polyps and cancer, flexible sigmoidoscopies or screening colonoscopies are performed even if the stool occult blood tests are negative.

1.14.2. Flexible sigmoidoscopy and colonoscopy

Beginning at age 50, a flexible sigmoidoscopy screening tests is recommended every three to five years. Flexible sigmoidoscopy is an exam of the rectum and the lower colon using a viewing tube (a short version of colonoscopy). Recent studies have shown that the use of screening flexible sigmoidoscopy can reduce mortality from colon cancer. This is a result of the detection of polyps or early cancers in people with no symptoms. If a polyp or cancer is found, a complete colonoscopy is recommended. The majority of colon polyps can be completely removed by colonoscopy without open surgery. Recently doctors are recommending screening colonoscopies instead of screening flexible sigmoidoscopies for healthy individuals starting at ages 50-55. [44]

Patients with a high risk of developing colorectal cancer may undergo colonoscopies starting at earlier ages than 50. For example, patients with family history of colon cancer are recommended to start screening colonoscopies at an age 10 years before the earliest colon caner diagnosed in a first-degree relative, or five years earlier than the earliest precancerous colon polyp discovered in a first-degree relative.

1.14.3. Genetic counseling and testing

Blood tests are now available to test for FAP, AFAP, MYH, and HNPCC hereditary colon cancer syndromes. Families with multiple members having colon cancers, members with multiple colon polyps, members having cancers at young ages and having other cancers such as cancers of the ureters, uterus, duodenum, etc., should be referred for genetic counseling followed possibly by genetic testing.

The advantages of genetic counseling followed by genetic testing include identifying family members at high risk of developing colon cancer to begin colonoscopies early

1.14.4. Diet to prevent colon cancer

People can change their eating habits by reducing fat intake and increasing fiber in their diet. Major sources of fat are meat, eggs, dairy products, salad dressings and oils used in cooking. Fiber is the insoluble, nondigestible part of plant material present in fruits, vegetables and whole-grain breads and cereals. It is postulated that high fiber in the diet

leads to the creation of bulky stools which can rid the intestines of potential carcinogens. In addition, fiber leads to the more rapid transit of fecal material through the intestine, thus allowing less time for a potential carcinogen to react with the intestinal lining.

1.15. Treatments for colon cancer

1.15.1. Surgery

Surgeries can be categorised into

- Curative
- Palliative
- Bypass
- Fecal diversion or
- Open-and-close.

Curative Surgical

Curative Surgical treatment can be offered if the tumor is localized.

- Very early cancer that develops within a polyp can often be cured by removing the polyp (i.e., polypectomy) at the time of colonoscopy.
- In colon cancer, a more advanced tumor typically requires surgical removal of the section of colon containing the tumor with sufficient margins and radical en-bloc resection of mesentery and lymph nodes to reduce local recurrence. If possible, the remaining parts of colon are anastomosed together to create a functioning colon.
- Curative surgery on rectal cancer includes total mesorectal excision or abdominoperineal excision.

Palliative

In case of multiple metastases, palliative (non curative) resection of the primary tumor is still offered in order to reduce further morbidity caused by tumor bleeding, invasion and its catabolic effect. Surgical removal of isolated liver metastases is however common and may be curative in selected patients; improved chemotherapy has increased the number of patients who are offered surgical removal of isolated liver metastases.

Bypass and Fecal diversion

If the tumor invaded into adjacent vital structures which makes excision technically difficult, the surgeons may prefer to bypass the tumor or to do a proximal fecal diversion through a stoma.

Open-and-close

The worst case would be an open-and-close surgery, when surgeons find the tumor unresectable and the small bowel involved; any more procedures are thought by some to do more harm than good to the patient. This is uncommon with the advent of laparoscopy and better radiological imaging. Most of these cases formerly subjected to "open and close" procedures are now diagnosed in advance and surgery avoided.

Laparoscopic-assisted colectomy is a minimally invasive technique that can reduce the size of the incision and may reduce post-operative pain. As with any surgical procedure, colorectal surgery may result in complications including:

- Wound infection, Dehiscence or hernia.
- Anastomosis breakdown, leading to abscess or fistula formation or peritonitis.
- Bleeding with or without hematoma formation.
- Adhesions resulting in bowel obstruction. A 5-year study of patients who had surgery in 1997 found the risk of hospital readmission to be 15% after panproctocolectomy, 9% after total colectomy and 11% after ileostomy. [45]
- Adjacent organ injury; most commonly to the small intestine, ureters, spleen or bladder.
- Cardiorespiratory complications such as myocardial infarction, pneumonia, arrythmia, pulmonary embolism etc.

1.15.2. Chemotherapy

Chemotherapy is used to reduce the likelihood of metastasis developing, shrink tumor size, or slow tumor growth. Chemotherapy is often applied after surgery (adjuvant), before surgery (neo-adjuvant), or as the primary therapy (palliative). The treatments listed here have been shown in clinical trials to improve survival and/or reduce mortality rate and have been approved for use by the US Food and Drug Administration. In colon cancer, chemotherapy after surgery is usually only given if the cancer has spread to the lymph nodes (Stage III).

- Adjuvant (after surgery) chemotherapy.
    - 5-fluorouracil (5-FU) or Capecitabine (Xeloda)
    - Leucovorin (LV, Folinic Acid)
    - Oxaliplatin (Eloxatin)

- Chemotherapy for metastatic disease. Commonly used first line chemotherapy regimens involve the combination of infusional 5-fluorouracil, leucovorin, and oxaliplatin (FOLFOX) with bevacizumab or infusional 5-fluorouracil, leucovorin, and irinotecan (FOLFIRI) with bevacizumab or the same chemotherapy drug combinations with cetuximab in KRAS wild type tumors

    - 5-fluorouracil (5-FU) or Capecitabine
    - UFT or Tegafur-uracil
    - Leucovorin (LV, Folinic Acid)
    - Irinotecan (Camptosar)
    - Oxaliplatin (Eloxatin)
    - Bevacizumab (Avastin)
    - Cetuximab (Erbitux)
    - Panitumumab (Vectibix)

- In clinical trials for treated/untreated metastatic disease.[46]
    - Bortezomib (Velcade)
    - Oblimersen (Genasense, G3139)
    - Gefitinib and Erlotinib (Tarceva)
    - Topotecan (Hycamtin)

At the 2008 annual meeting of the American Society of Clinical Oncology, researchers announced that colorectal cancer patients that have a mutation in the KRAS gene do not respond to certain therapies, those that inhibit the epidermal growth factor receptor (EGFR) namely Erbitux (cetuximab) and Vectibix (panitumumab).[47] Following recommendations by ASCO, patients should now be tested for the KRAS gene mutation before being offered these EGFR-inhibiting drugs.[48] In July 2009, the US Food and Drug Administration (FDA) updated the labels of two anti-EGFR monoclonal antibody drugs panitumumab (Vectibix) and cetuximab (Erbitux) indicated for treatment of metastatic colorectal cancer to include information about KRAS mutations.[49]

1.15.3. Radiation therapy

Radiotherapy is not used routinely in colon cancer, as it could lead to radiation enteritis, and it is difficult to target specific portions of the colon. It is more common for radiation to be used in rectal cancer, since the rectum does not move as much as the colon and is thus easier to target. Indications include:

- Colon cancer
  - pain relief and palliation - targeted at metastatic tumor deposits if they compress vital structures and/or cause pain. [60]
- Rectal cancer
  - neoadjuvant - given before surgery in patients with tumors that extend outside the rectum or have spread to regional lymph nodes, in order to decrease the risk of recurrence following surgery or to allow for less invasive surgical approaches (such as a low anterior resection instead of an abdomino-perineal resection). In locally advanced adenocarcinoma of middle and lower rectum, regional hyperthermia added to chemoradiotherapy achieved good results in terms of rate of sphincter sparing surgery.[51]
  - adjuvant - where a tumor perforates the rectum or involves regional lymph nodes.
  - palliative - to decrease the tumor burden in order to relieve or prevent symptoms.

Sometimes chemotherapy agents are used to increase the effectiveness of radiation by sensitizing tumor cells if present.

1.15.4. Immunotherapy

Bacillus Calmette-Guérin (BCG) is being investigated as an adjuvant mixed with autologous tumor cells in immunotherapy for colorectal cancer.[52]

1.15.5. Cancer Vaccine

TroVax, a cancer vaccine,[56] produced by Oxford BioMedica,[55] is in Phase III trials for renal cancers and phase III trials are planned for colon cancers.[54]

1.15.6. Other treatments

Other treatments have included the use of localized infusion of chemotherapeutic agents into the liver, the most common site of metastasis. This involves the insertion of a pump into the blood supply of the liver which can deliver high doses of medicine directly to the liver tumor. Response rates for these treatments have been reported to be as high as eighty percent. Side effects can be serious. [57] Additional experimental agents considered for the treatment of colon cancer include the use of cancer-seeking antibodies bound to cancer-fighting drugs. Such combinations can specifically seek and destroy tumor tissues in the body. [58] Other treatments attempt to boost the immune system, the bodies' own defense system, in an effort to more effectively attack and control colon cancer. In patients who are poor surgical risks, but who have large tumors which are causing obstruction or bleeding, laser treatment can be used to destroy cancerous tissue and relieve associated symptoms. [59] Still other experimental agents include the use of photodynamic therapy. In this treatment, a light sensitive agent is taken up by the tumor which can then be activated to cause tumor destruction.

1.15.7. Follow-up care

Follow-up exams are important after treatment for colon cancer. The cancer can recur near the original site or in a distant organ such as the liver or lung. Follow-up exams include a physical examination by the doctor, blood tests of liver enzymes, chest x-rays, CAT scans of the abdomen and pelvis, colonoscopies, and blood CEA levels. Abnormal liver enzymes may indicate growth of liver metastasis. [66] CEA levels may be elevated before surgery and become normal shortly after the cancer is removed. Slowly rising CEA level may indicate cancer recurrence. A CAT scan of the abdomen and pelvis can show tumor recurrence in the liver, pelvis, or other areas. Colonoscopy can show recurrence of polyps or cancer in the large intestine. [67]

In addition to checking for cancer recurrence, patients who have had colon cancer may have an increased risk of cancer of the prostate, breast, and ovary. Therefore, follow-up examinations should include these areas.

1.16. Future hold for patients with colorectal cancer

Colon cancer remains a major cause of death and disease, especially in the western world. A clear understanding of the causes and course of the disease is emerging. This has allowed for recommendations regarding screening and prevention of this disease. [66]The removal of colon polyps helps prevent colon cancer. Early detection of colon cancer can improve the chances of a cure and overall survival. Treatment remains unsatisfactory for advanced disease, but research in this area remains strong and newer treatments continue to emerge. New and exciting preventive measures have recently focused on the possible beneficial effects of aspirin or other anti-inflammatory agents. In trials, the use of these agents has markedly limited colon cancer formation in several experimental models. [65] Other agents being evaluated to prevent colon cancer include calcium, selenium, and vitamins A, C, and E. More studies are needed before these agents can be recommended for widespread use by the public to prevent colon cancer. [68]

1.17. Rationale of the work

Our main objective was to study the pattern of colorectal cancer and their treatment in Bangladesh. It is not a well known cancer in our country but many people are dying due to colorectal cancer before detecting.

The objectives of the study were as follows:

- To investigate the present status of colorectal cancer in our country.
- To make an analysis based on the data collected about the prevalence of colorectal cancer in our country due to sex, age, social classes, area of living, educational level & profession.
- To know the details about the risk factors, sign & symptoms, types of colorectal cancer.
- To study the pattern of colorectal cancer.
- To study medical tests those detect the stages of colorectal cancer.
- To know about the treatment patterns & side effects of the treatment so that some new modification can be added.
- To identify the drug used in managing the colorectal cancer and duration of action.
- And finally, to increase the awareness to prevent this disease.

CHAPTER 02: METHOD & MATERIALS

2. METHOD & MATERIALS

2.1. Method

1. Number of Study Center: 3 (Three)
2. Number of Patients: 31
3. Study Site:

Study Site	Name & address	Patients no.
Study Centre 1	National Institute of Cancer Research & Hospital (NICRH). Address: Mohakhali, Dhaka, Bangladesh.	10
Study Centre 2	Bangabandhu Sheikh Mujib Medical University (BSMMU) Address: Shahbag, Dhaka Bangladesh.	13
Study Centre 3	Reliance Medical Centre. Address: Mohakhali, Dhaka, Bangladesh	08

4. Duration of Study: Six (6) Months.
5. Observation Type: Prospective.
6. Inclusion and Exclusion Criteria:

All the patients (Both in and out patients) who underwent treatment at Oncology department of Bangabandhu Sheikh Mujib Medical University, National Institute of Cancer Research & Hospital and Reliance Medical Centre will be included.

7. Operational Modality:

Indoor (Hospitalized) & outdoor patients of colorectal cancer form National Institute of Cancer Research & Hospital, Reliance Medical Centre and Bangabandhu Sheikh Mujib Medical University were studied. Information like age, sex, biophysical characteristics, signs and symptoms, causes, types of colorectal cancer, treatment pattern and drugs prescribed to treat colorectal cancer, duration of treatment, hospital cost and family history were analyzed by using Microsoft Word and Microsoft Excel Software.

2.2. Volunteer Consent form

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

Volunteer consult 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 any physical, mental 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. Have you decided intentionally to participate in this experiment?	Yes/No
6. Do you think this experiment violate your human rights?	Yes/No
7. Are you sure that all the information regarding you will be kept confidentially?	Yes/No
8. No remuneration will be provided for this experiment, are you aware of this?	Yes/No

After reading all the 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:

2.3. Data collection form

Questionnaires

1. Identification of patient:

1.1 ID Code:

1.2 Name:

1.3 Father's/Husband's:

1.4 Sex: Male | Female

1.5 Marital Status: Married | Unmarried

1.6 Date of Birth: (Dd/mm/yy)

1.7 Age (yr):

1.8 Mailing address

ph

1.9 Permanent address

ph

1.10. Religion

1.11 Nationalities:

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>6 Months	
Current smoker	

3. Biophysical Characteristics:

Characteristics	Before	After
3.1 Height (cm):		
3.2 Weight (kg):		
3.3 Pulse/min:		
3.4 Temperature:		
3.5 BP (sys/dias):		
3.6 Color: change		

4. Investigation of colorectal cancer patients:

4.1 Patient status:

Out patient	
In patient	
Length of hospital stay	

4.2 Age distribution:

Age group (Years)			
Less than 10		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		
Chrone'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	
Abdominal pain		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	
Blood in the urine		Jaundice	
Feeling of incomplete defecation (tenesmus)			

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 *APC* gene	
Ultrasonography		Magnetic resonance imaging (MRI)	
Angiography		Radionuclide Scanning	
chest x-rays		CT scan of the lungs, liver and abdomen.	

4.6.2 Hematology:

	Before Treatment	Middle of the treatment	Present condition
Hemoglobin			
ESR			
Carcinoembryonic antigen(CEA)			
Platelets			

4.6.3 Biochemical examination of patient:

	Before treatment	Middle of the treatment	Present condition
Bilirubin SP			
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		Hormone therapy	
Chemotherapy		Adjuvant Chemotherapy	
Radiotherapy		Palliative Chemotherapy	

4.7.2 Drugs used for colorectal cancer 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	

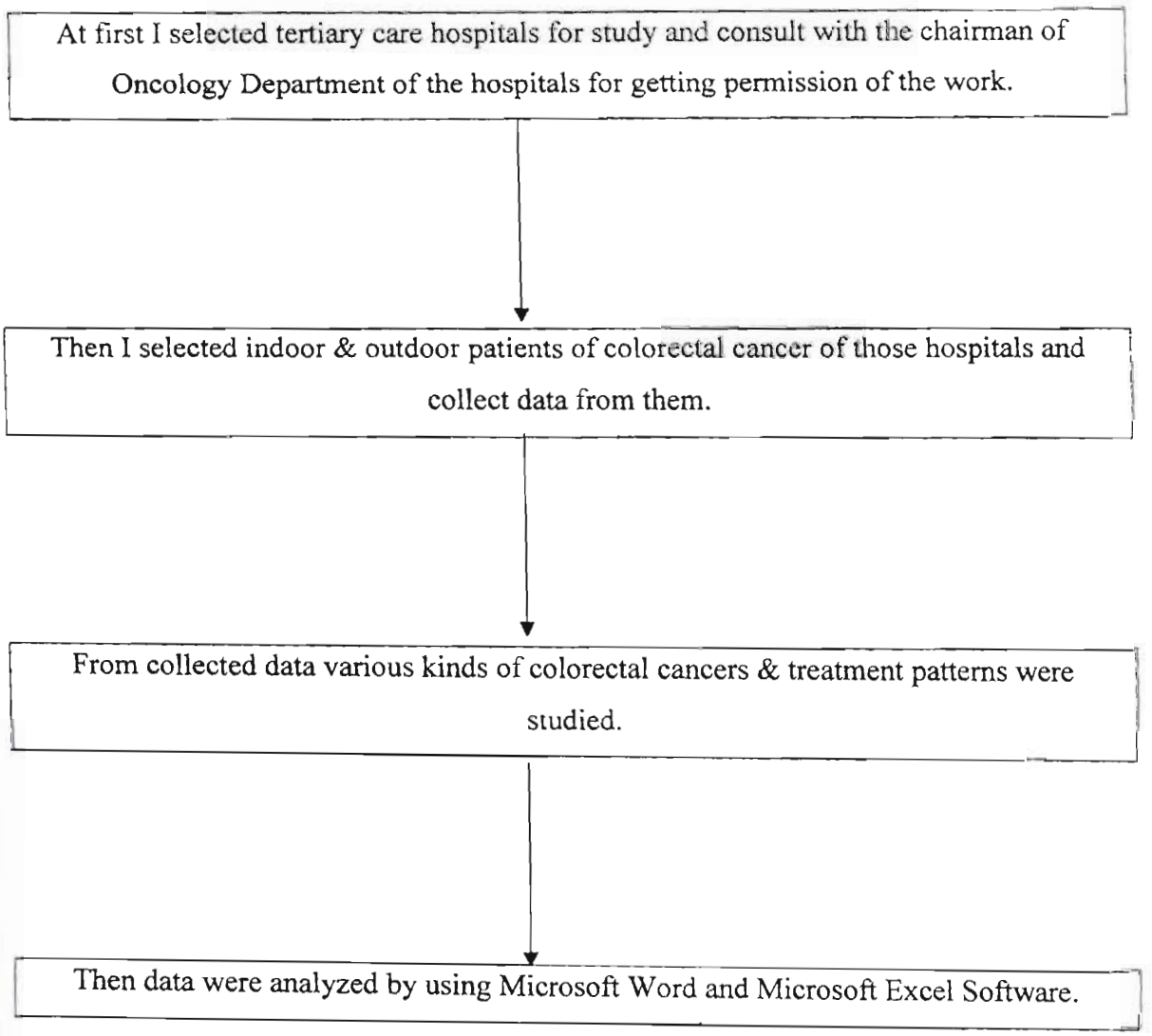
4.7.5 Side effects of colorectal cancer treatment:

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

Investigated by

Name: Signature: Date:

2.4. Study Protocol



CHAPTER 03: RESULTS

3. RESULTS

3.1 Results

In our study 31 patients suffering from colorectal cancer were randomly from three different study centers during six months study period according to method discussed earlier.

3.1.1. Sex variation of colorectal cancer patients

31 patients includes male (n = 27) & female (n = 04). The prevalence of colorectal cancer according to sex variation was tabulated & shown by graph as follow:

Table 3.1 Sex variation of colorectal cancer patients

Sex	Male	Female
No. of Patients (N) = 31	27	4
Prevalence (%)	87.1	12.9

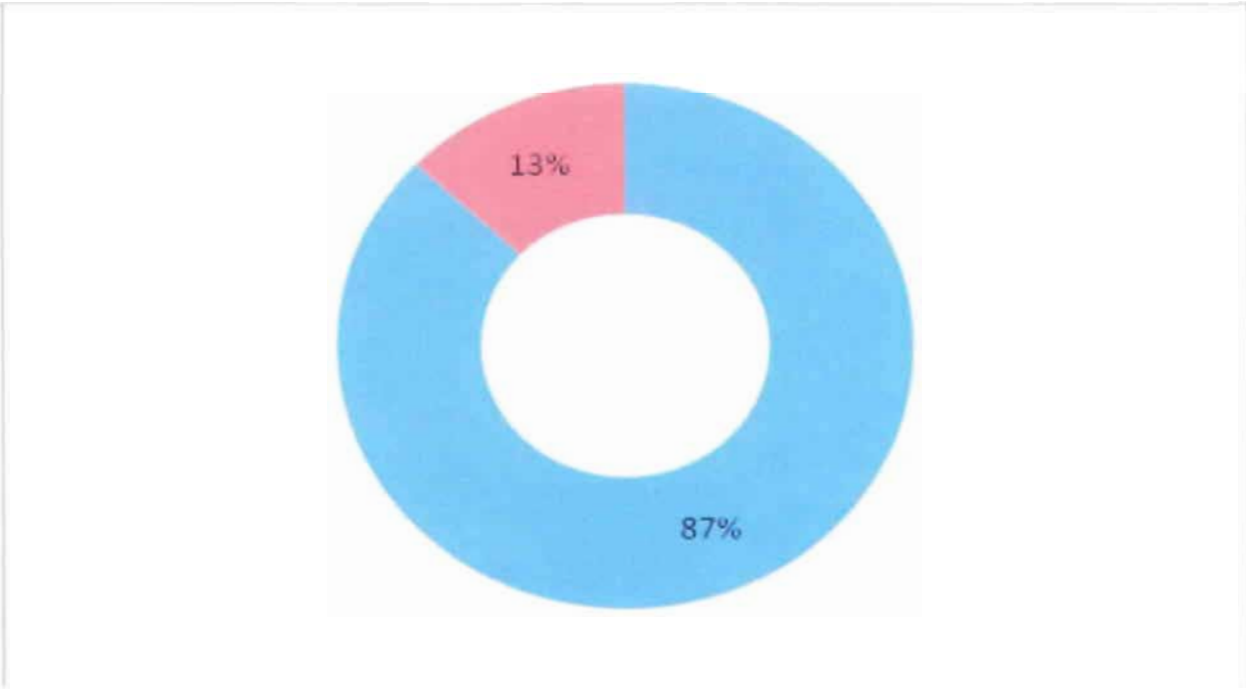


Figure 3.1 Sex variations of colorectal cancer patients

From the Table 3.1 & Figure 3.1, it was observed that 87.1% affected patients were male and 12.9% female were found suffering from colorectal cancer in our study period.

3.1.2. Marital status of patients

Among the randomly selected 31 patients marital status of the patients were observed which include married (n = 26) & unmarried (n = 5). The prevalence of colorectal cancer in patients according to marital status type was tabulated & shown by graph as follow:

Table 3.2 Prevalence of colorectal cancer due to marital status

Marital Status	Married	Unmarried
No. of Patients (N) = 31	26	5
Prevalence (%)	83.87	16.13

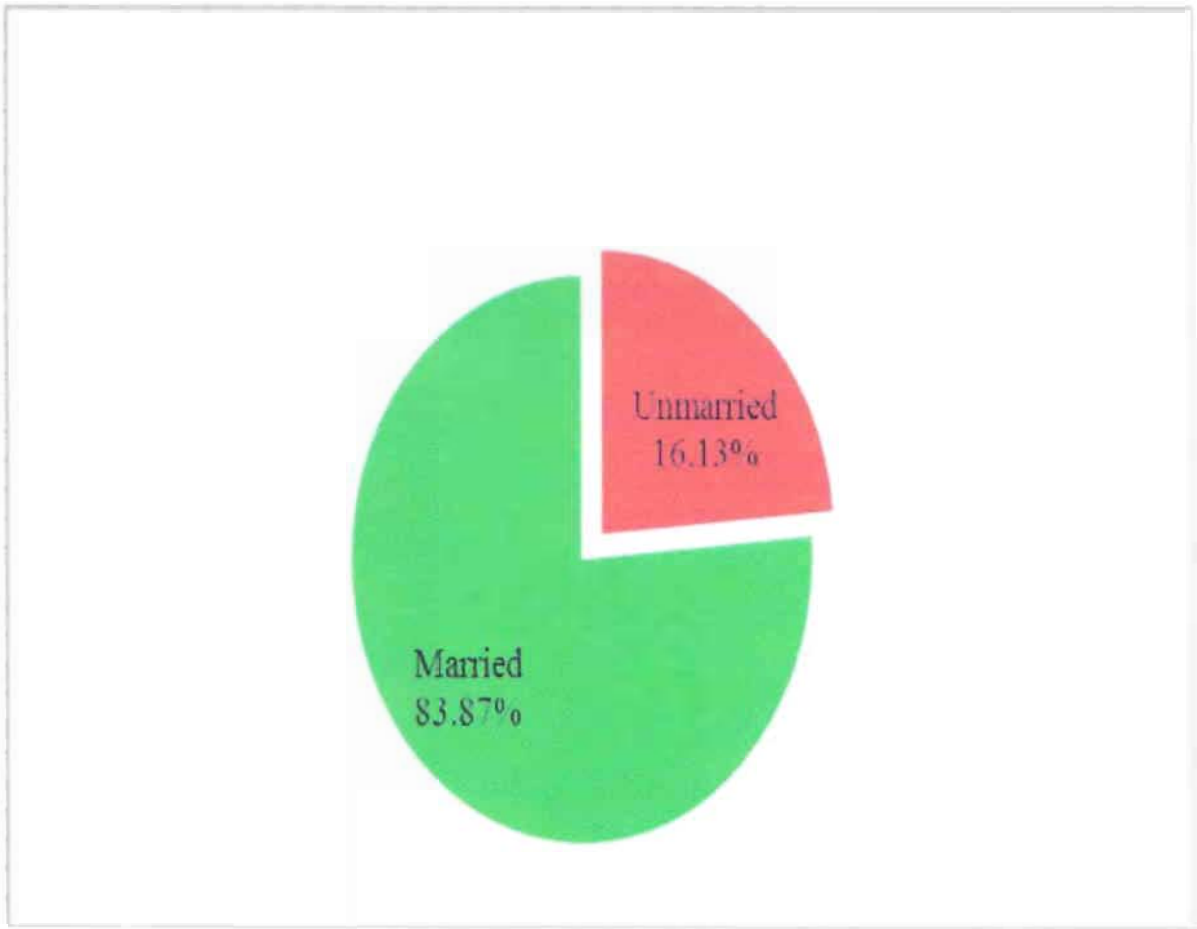


Figure 3.2 Prevalence of colorectal cancer due to marital status

From the above Table 3.2 & Figure 3.2, it was observed that 83.87% affected patients were married whereas 16.13% patients were unmarried.

3.1.3. Age distribution of colorectal patients

Among the randomly selected 31 patients the prevalence of colorectal cancer according to their age distribution was tabulated & shown by graph as follow:

Table 3.3 Prevalence of colorectal cancer due to age distribution

Age	Amount	Percentage
<21	0	0
21-30	6	19.36
31-40	10	32.26
41-50	4	12.9
51-60	7	22.58
>60	4	12.9

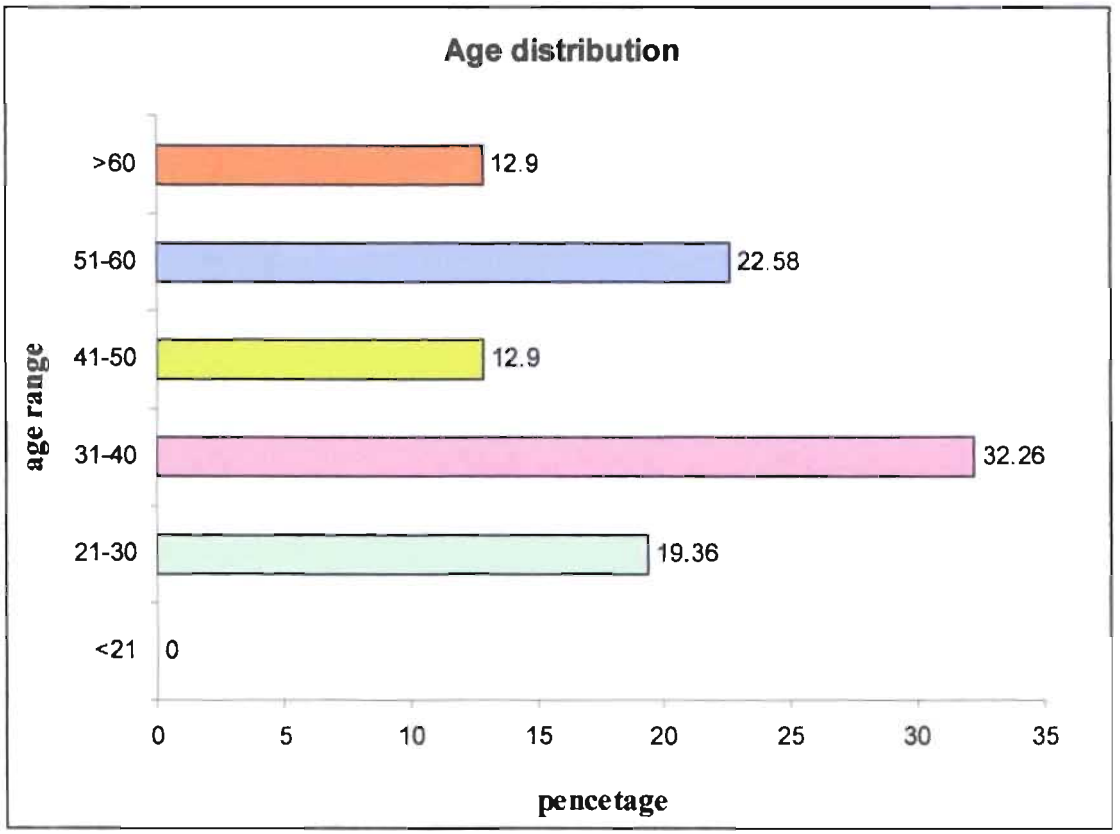


Figure 3.3 Prevalence of colorectal cancer due to age distribution

From the above Table 3.3 & Figure 3.3, it was observed that 33.26% affected colorectal patients were within the age range 31-40years & about 22.58% were within 51-60 years range.

3.1.4. Religion difference of the patients

Among the randomly selected 31 patients the prevalence of colorectal cancer according to their religion was tabulated & shown by graph as follow:

Table 3.4 Prevalence of colorectal cancer due to Religion

Religion	Amount	Percentage
Islam	28	90.32
Hindu	3	9.68

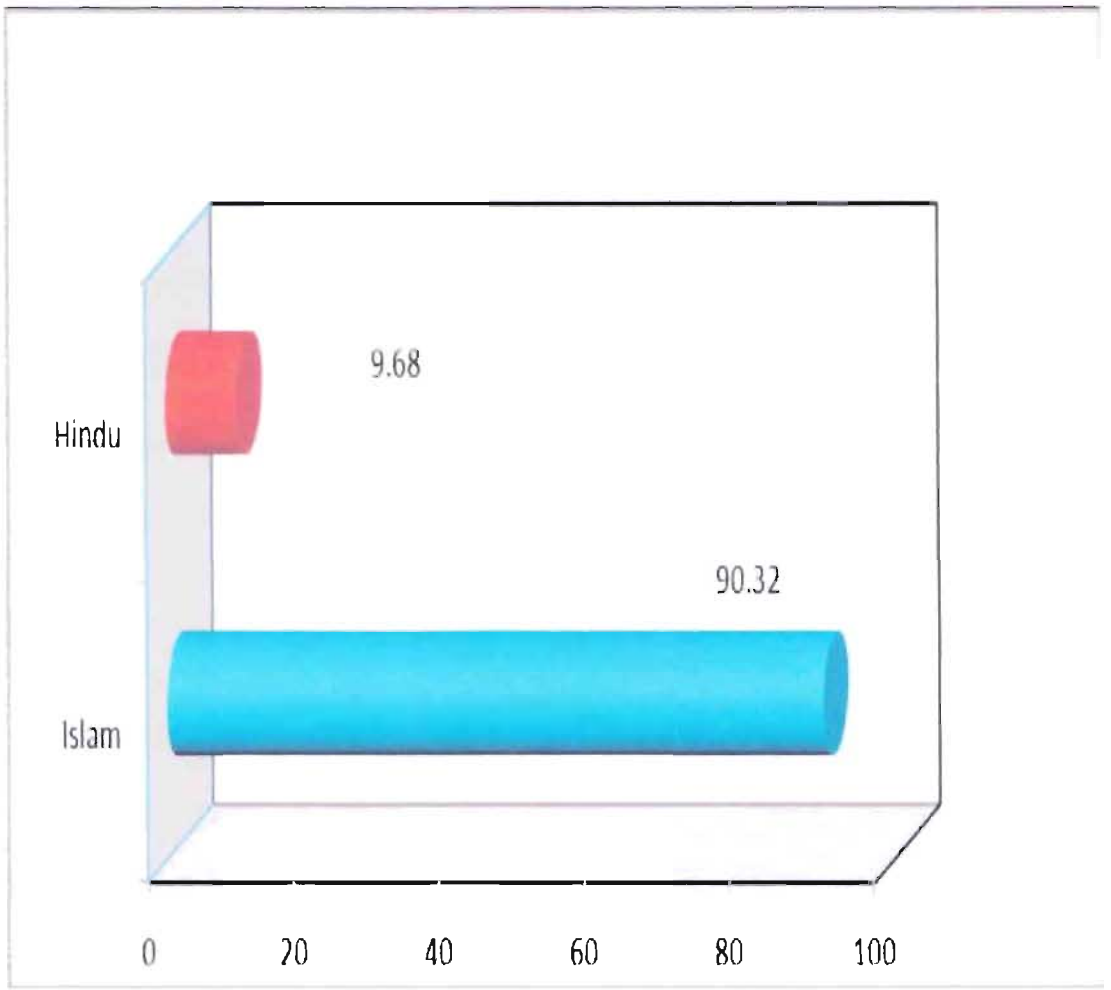


Figure 3.4 Prevalence of colorectal cancer due to age distribution

From the above Table 3.4 & Figure 3.4, it was observed that 90.32% affected colorectal patients were Muslim & about 9.68% were Hindu.

3.1.5. Area of residence

Colorectal patients were residence of different area which is presented in the following table 3.5 & graph 3.5.

Table 3.5 Area of residence of colorectal patients

Area	Amount	Percentage
Rural	6	19.36
Urban	9	29.03
S-urban	15	48.38
Others	1	3.23

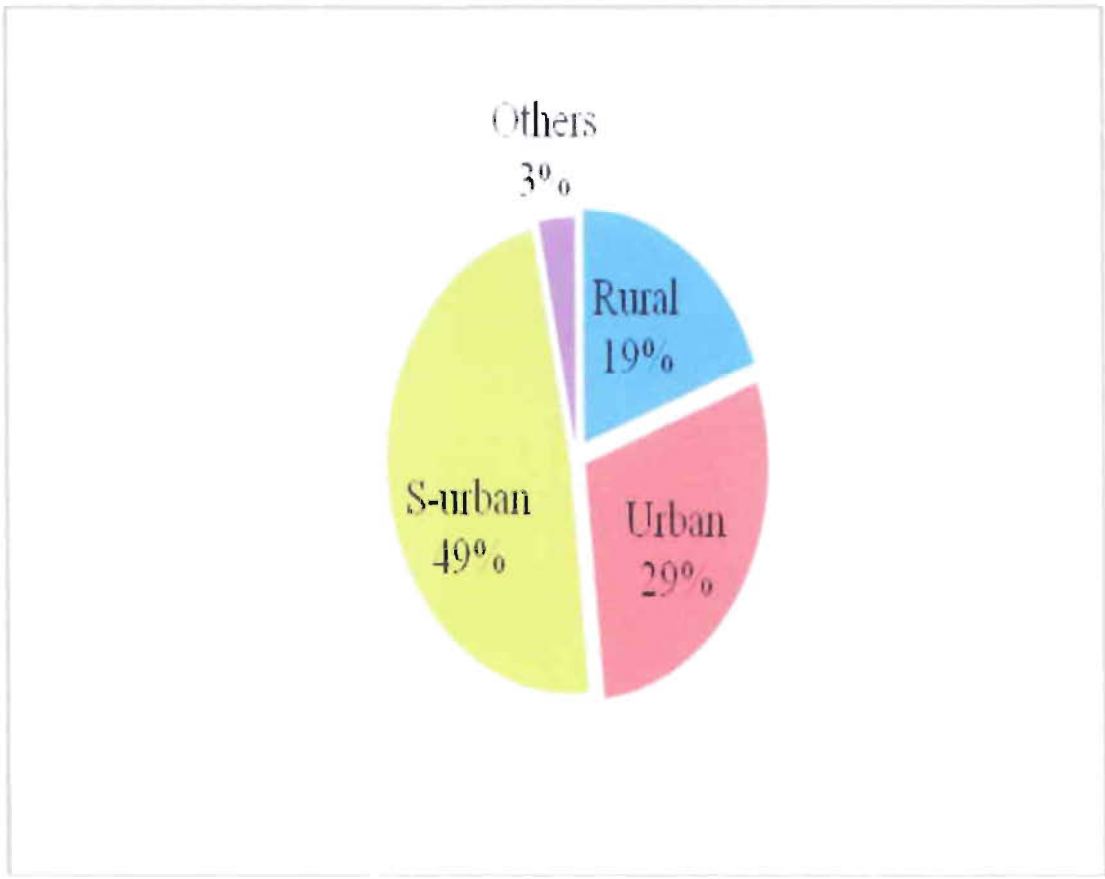


Figure 3.5 Area of residence of colorectal patients

From above Table 3.5 & Figure 3.5, it was shown that a significant portion (48.38%) of patients living in S-urban areas who were affected by colorectal cancer.

3.1.6. Education levels of patients

Education level of the patients were observed & presented in the following Table 3.6 & Figure 3.6:

Table 3.6 Education level of colorectal cancer affected patients

Education	Amount	Percentage
Illiterate	2	6.45
can read/write only	4	12.9
SSC	13	41.94
HSC	12	38.71
Graduate	0	0
Others	0	0

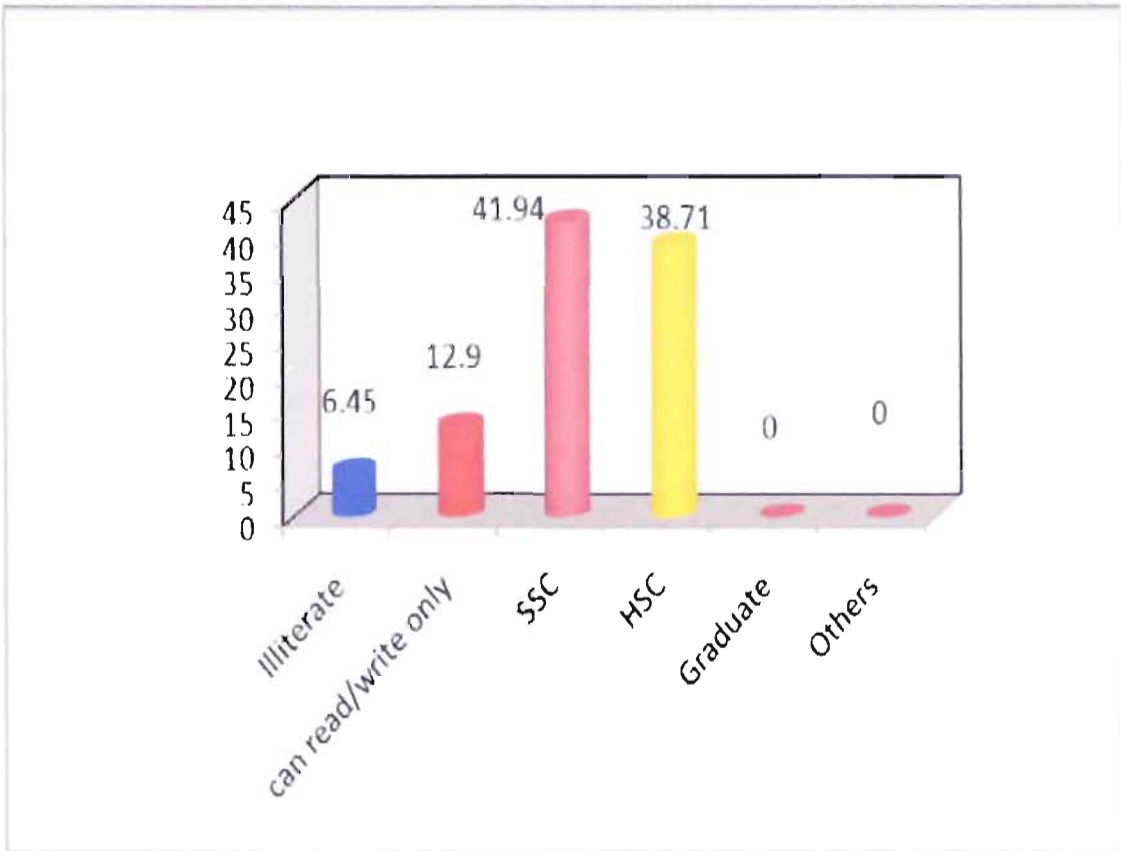


Figure 3.6 Education levels of colorectal cancer patients

From the above Table 3.6 & Figure 3.6, it was shown that the major portion (41.94%) of the affected patients was S.S.C. or equivalently qualified.

3.1.7. Occupation of colorectal cancer patients

The prevalence of colorectal cancer in occupation was tabulated and graph below:

Table 3.7 Occupation of colorectal cancer patients

Occupation	Amount	Percentage
Business	13	41.94
Skilled worker	9	29.03
Unemployed/ pensioner	6	19.35
Housewife	2	6.45
Others	1	3.23

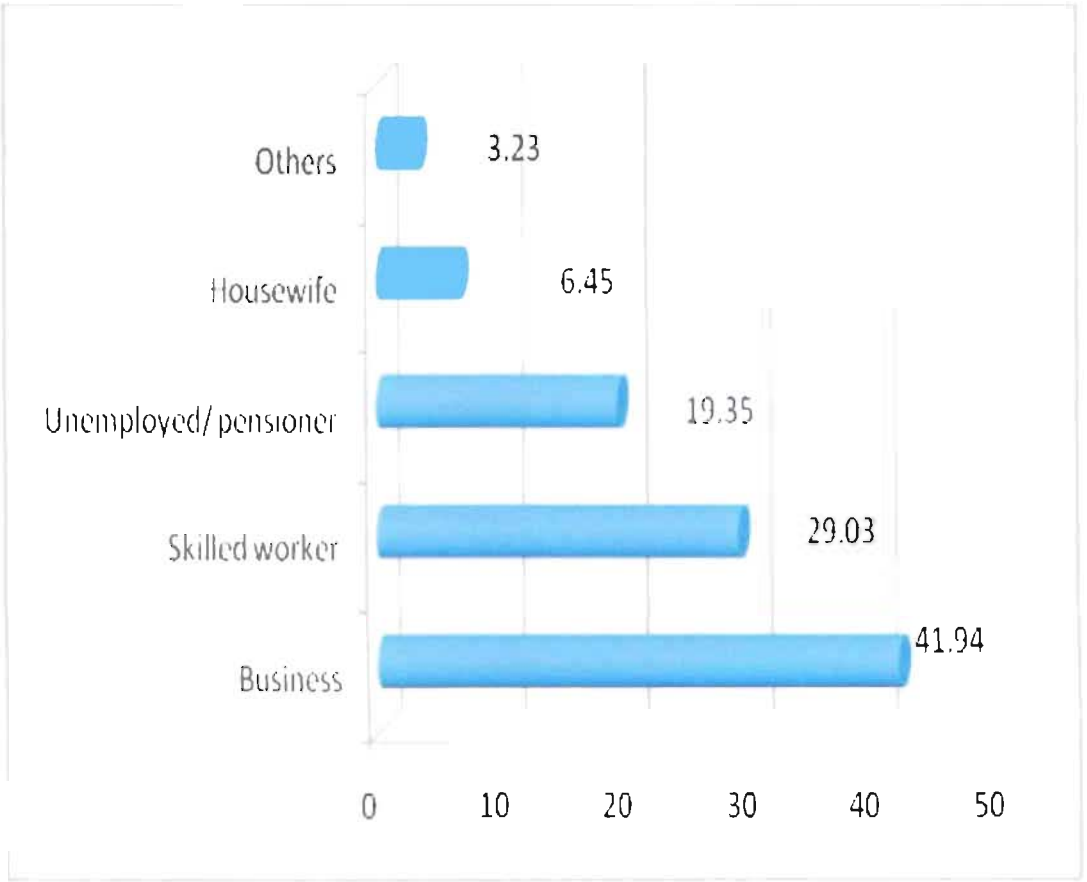


Figure 3.7 Occupation of colorectal cancer patients

From above Table 3.7 & Figure 3.7, it was shown that patients who were doing business (41.94%) were affected by colorectal Cancer.

3.1.8. Social Class of colorectal cancer patients

The prevalence of colorectal cancer in Social Class was tabulated and graph according to age and a graph was drawn below:

Table 3.8 Social Class of colorectal cancer patients

Social Class	Amount	Percentage
Upper middle	1	3.23
lower middle	18	58.06
Poor	12	38.87
Others	0	0

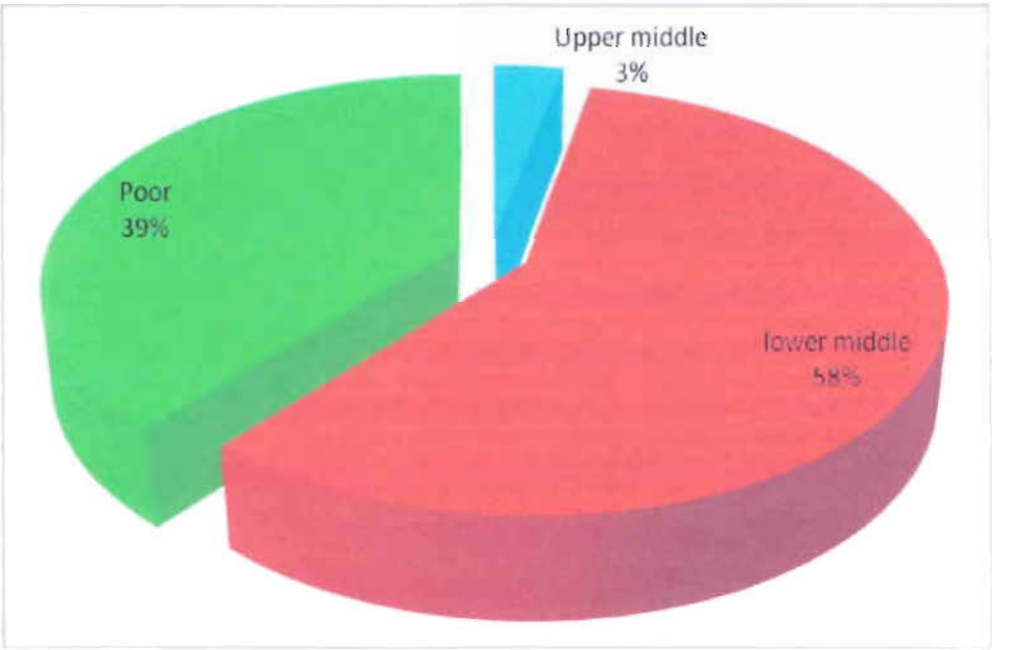


Figure 3.8 Social Class of colorectal cancer patients

From above Table 3.8 & Figure 3.8, it was shown that mostly patients who were in lower middle classes (58.06%) were affected by Colorectal Cancer.

3.1.9. Smoking habit of colorectal cancer patients

The prevalence of colorectal cancer in Social Class was tabulated and graph according to age and a graph was drawn below:

Table 3.9 Smoking habit of colorectal cancer patients

Smoking habit	Amount	Percentage
non-smoker	14	45.16
Ex-smoker	13	41.94
Current smoker	4	12.9

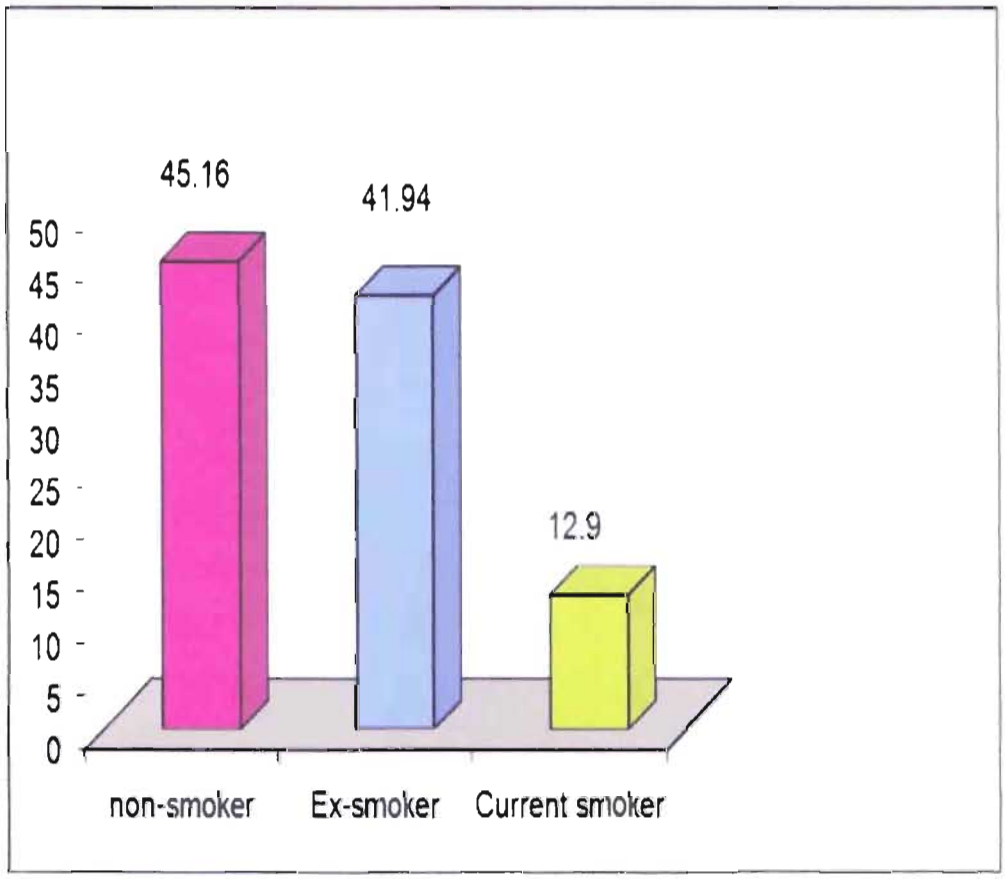


Figure 3.9 Smoking habits of colorectal cancer patients

From the above Table 3.9 & Figure 3.9, it was observed that most of the patients were non smoker (45.16%).

3.1.10. Stage of colorectal cancer patients

The prevalence of colorectal cancer in Stage was tabulated and graph according to age and a graph was drawn below:

Table 3.10 Stage of colorectal cancer patients

Stage	Amount	Percentage
Stage I	24	77.42
Stage II	7	22.58
Stage III	0	0
Stage IV	0	0

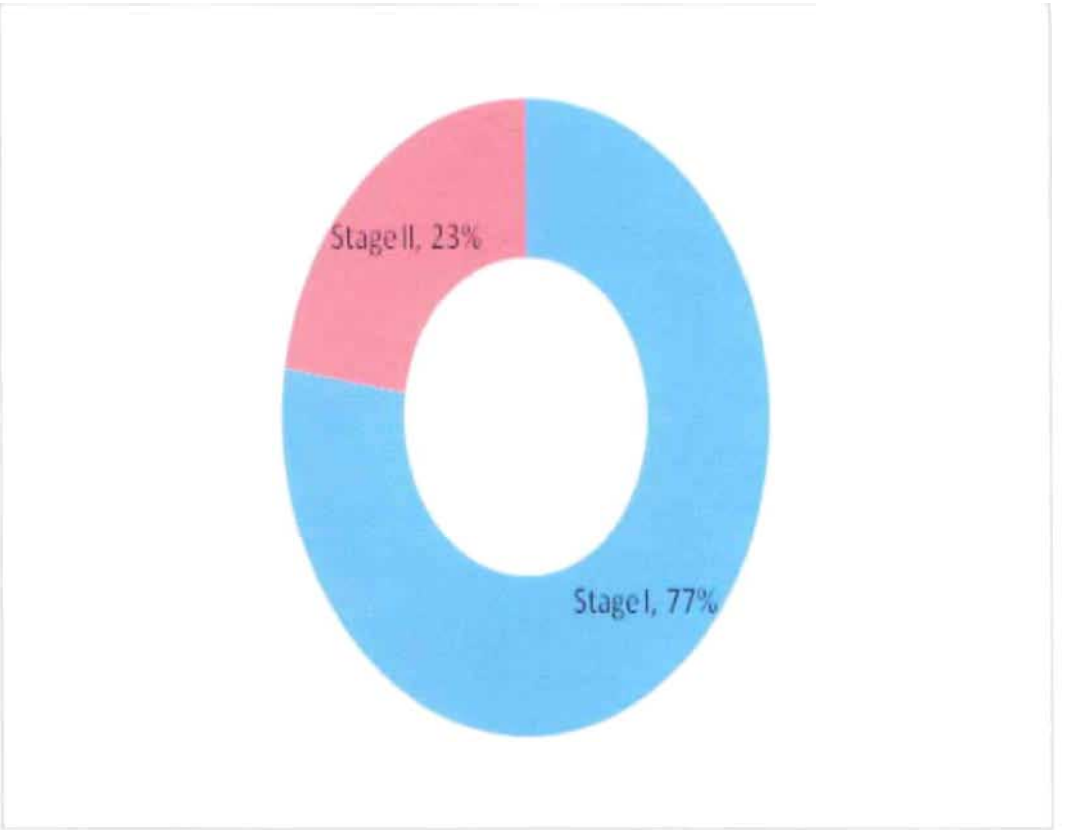


Figure 3.10 Stages of colorectal cancer patients

From the above Table 3.10 & Figure 3.10, it was shown that stage I colorectal cancer was most prevalent (77%) in our country compared to the other stages

3.1.11. Weight changes of colorectal cancer patients

The prevalence of colorectal cancer in weight changes were tabulated and graph according to age and a graph was drawn below:

Table 3.11 Weight changes of colorectal cancer patients

Weight change	Amount	Percentage
Weight increase	0	0
weight decrease	26	83.9
No change	5	16.1

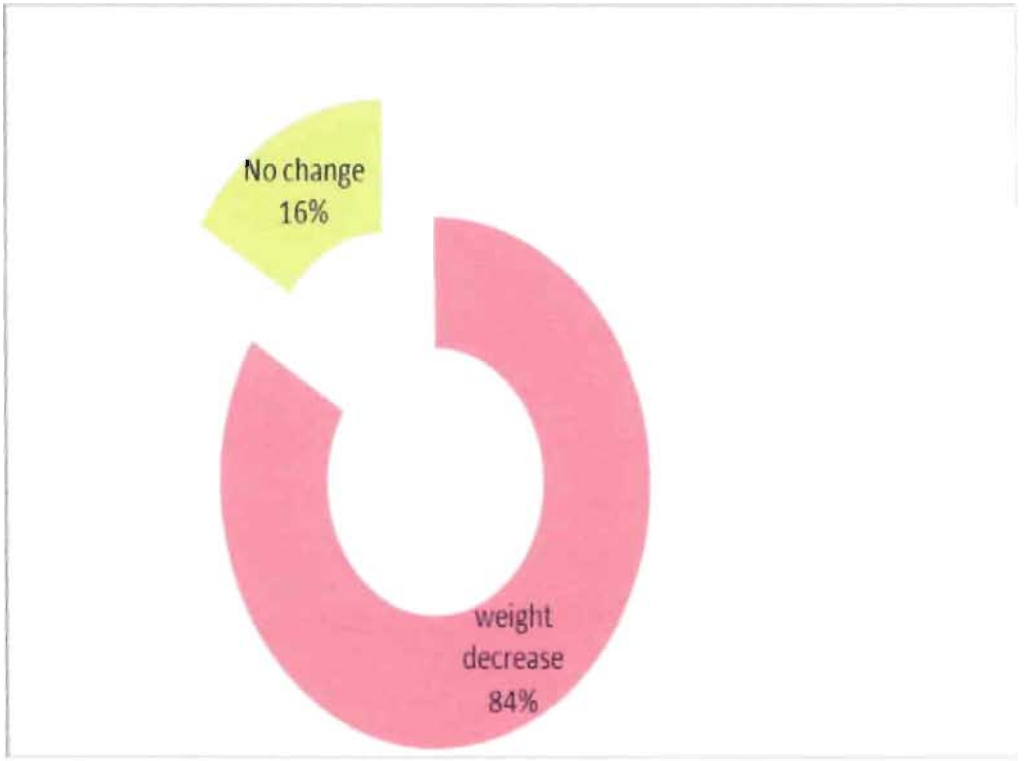


Figure 3.11 Weight changes of colorectal cancer patients

From the above Table 3.11 & Figure 3.11, it was observed that colorectal cancer was most prevalent in weight range 51-60kg (51.61%) and in 61-70kg (45.16%) in our country compared to the other age ranges.

3.1.12. Renal function of colorectal cancer patients

The prevalence of colorectal cancer in renal function was tabulated and graph according to age and a graph was drawn below:

Table 3.12 Renal function f colorectal cancer patients

Renal function	Amount	Percentage
Normal	0	0
Abnormal	31	100

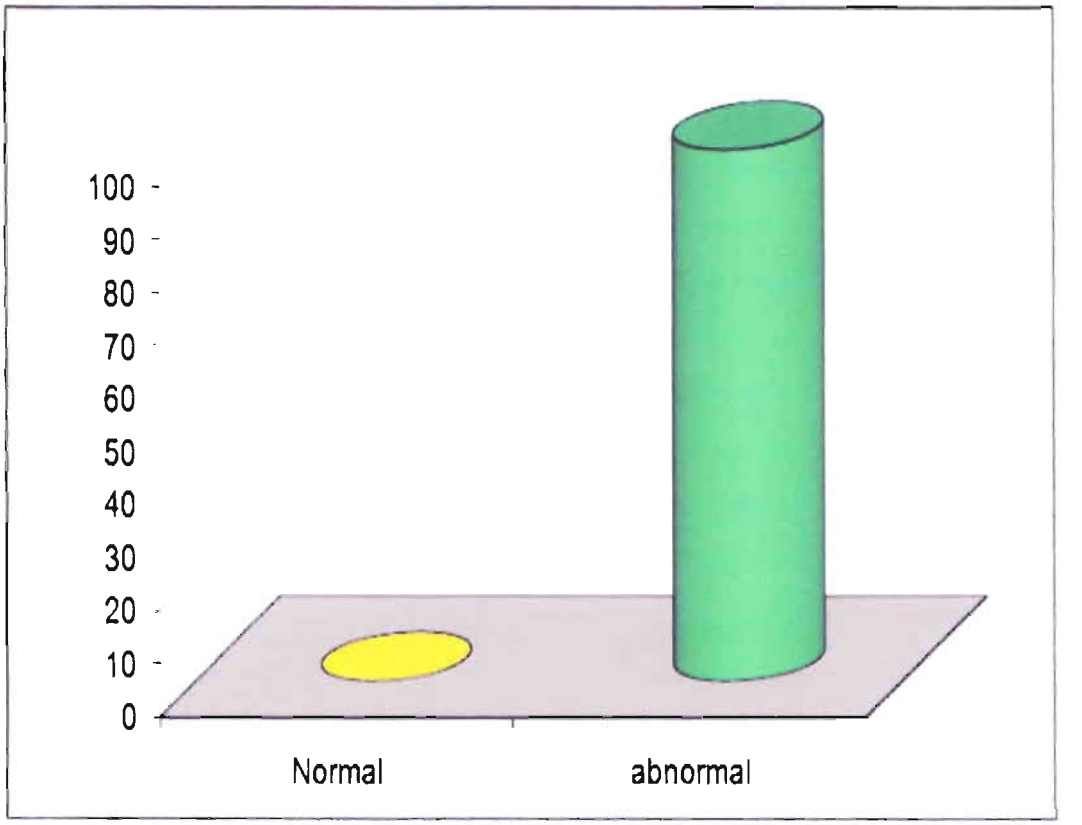


Figure 3.12 Renal functions of colorectal cancer patients

From the above Table 3.12 & Figure 3.12, it was observed that colorectal cancer was 100% prevalent in abnormal renal function.

3.1.13. Hepatic function of colorectal cancer patients

The prevalence of colorectal cancer in hepatic function was tabulated and graph according to age and a graph was drawn below:

Table 3.13 Hepatic function of colorectal cancer patients

Hepatic function	Amount	Percentage
Normal	0	0
Abnormal	31	100

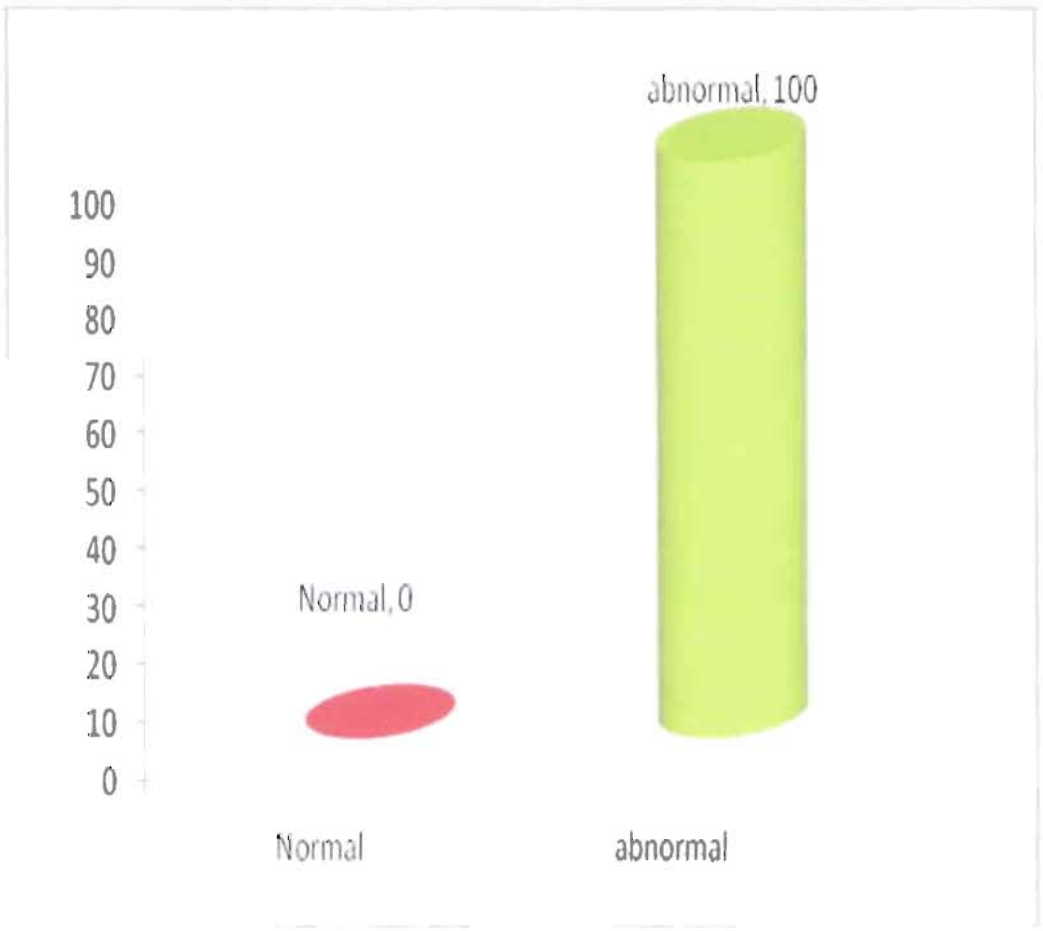


Figure 3.13 Hepatic functions of colorectal cancer patients

From the above Table 3.13 & Figure 3.13, it was observed that colorectal cancer was 100% prevalent in abnormal hepatic function.

3.1.14. Risk Factors of colorectal cancer patients

The prevalence of colorectal cancer in risk Factors was tabulated and graph according to age and a graph was drawn below:

Table 3.14 Risk Factors f colorectal cancer patients

Risk Factors	Amount	Percentage
Age	4	14.29
Diet	7	25
Polyps	5	17.86
Chrone'sDiease	4	14.29
History of ulcerative colotis	8	28.56
Personal medical history of any cancer	0	0
Family medical history of cancer	0	0
genetic alteration	0	0

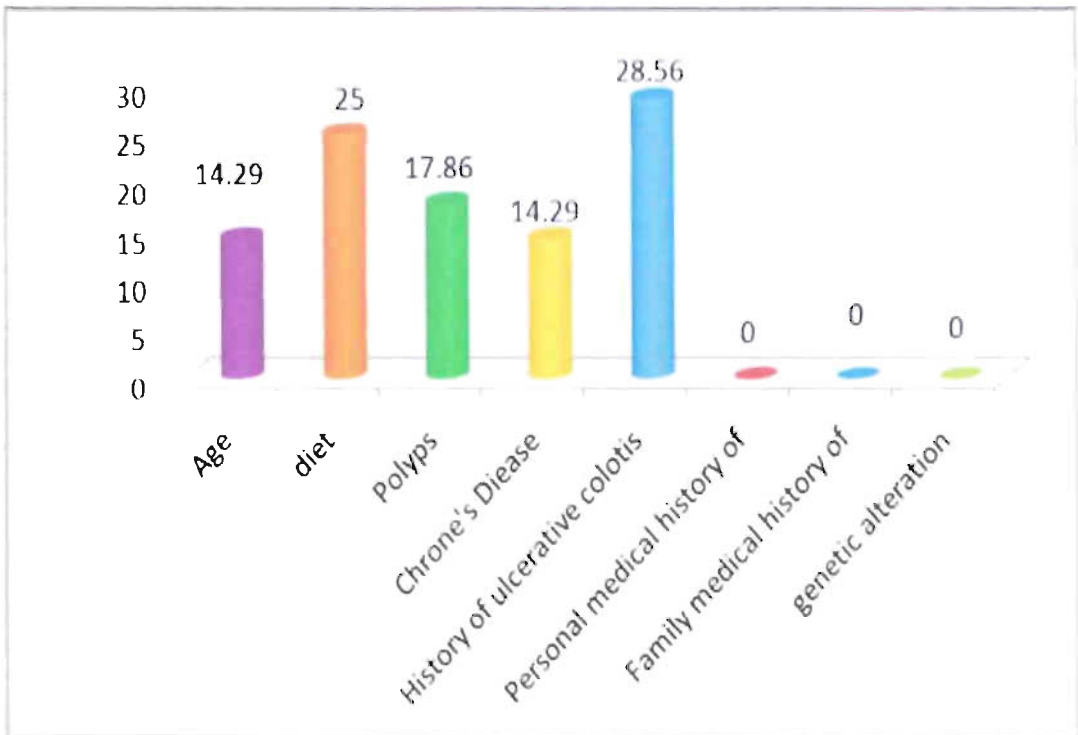


Figure 3.14 Risk Factors of colorectal cancer patients

From the above Table 3.14 & Figure 3.14, it was observed that colorectal cancer was mostly due to ulcerative colitis (28.56%).

3.1.15. Signs & symptoms of colorectal cancer patients

The prevalence of colorectal cancer in Sign & symptoms was tabulated and graph according to age and a graph was drawn below:

Table 3.15 Signs & symptoms f colorectal cancer patients

A change in bowel habits	Amount	Percentage
Diarrhea	10	3.84
Constipation	23	8.85
Feeling of incomplete defecation	29	11.15
Blood in the stool	23	8.85
Stools that are narrower than usual	23	8.85
Decreased appetite.	29	11.15
Blood in the urine	23	8.85
Abdominal pain	22	8.82
General abdominal discomfort	21	8.08
Weight loss	26	10
Constant tiredness	23	8.85
Vomiting	13	5
Black stool with a tarry appearance	5	1.92
Fever	28	10.77

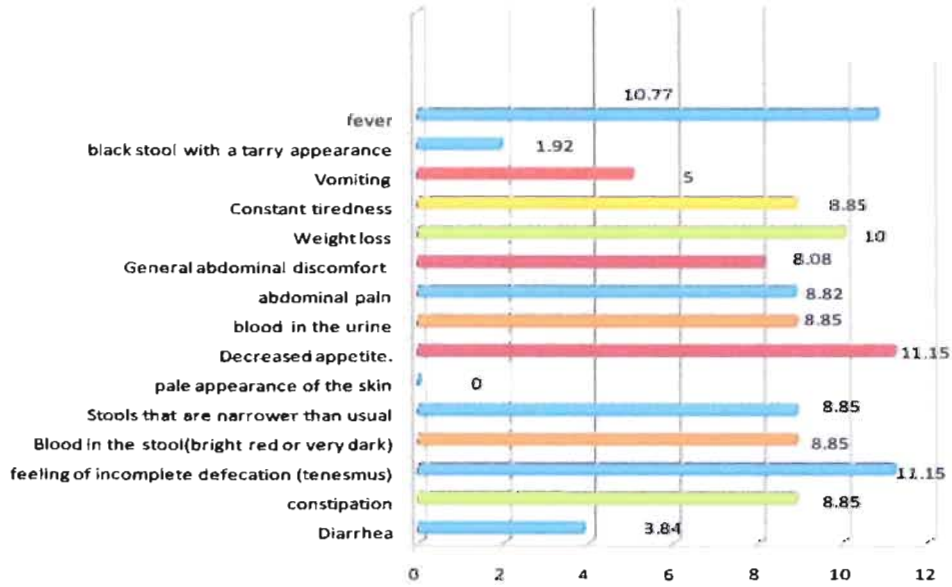


Figure 3.15 Signs & symptoms of colorectal cancer patients

From the above Table 3.15 & Figure 3.15, it was observed that colorectal cancer was mostly known by feeling of incomplete defecation, decreased appetite & fever.

3.1.16 Tests for colorectal cancer

The prevalence in tests for colorectal cancer was tabulated and graph according to age and a graph was drawn below:

Table 3.16 Tests for colorectal cancer

Tests for colorectal cancer	Amount	Percentage
Digital rectal exam (DRE)	34	100
Fecal occult blood test (FOBT)	34	100
Sigmoidoscopy	34	100
Colonoscopy	34	100

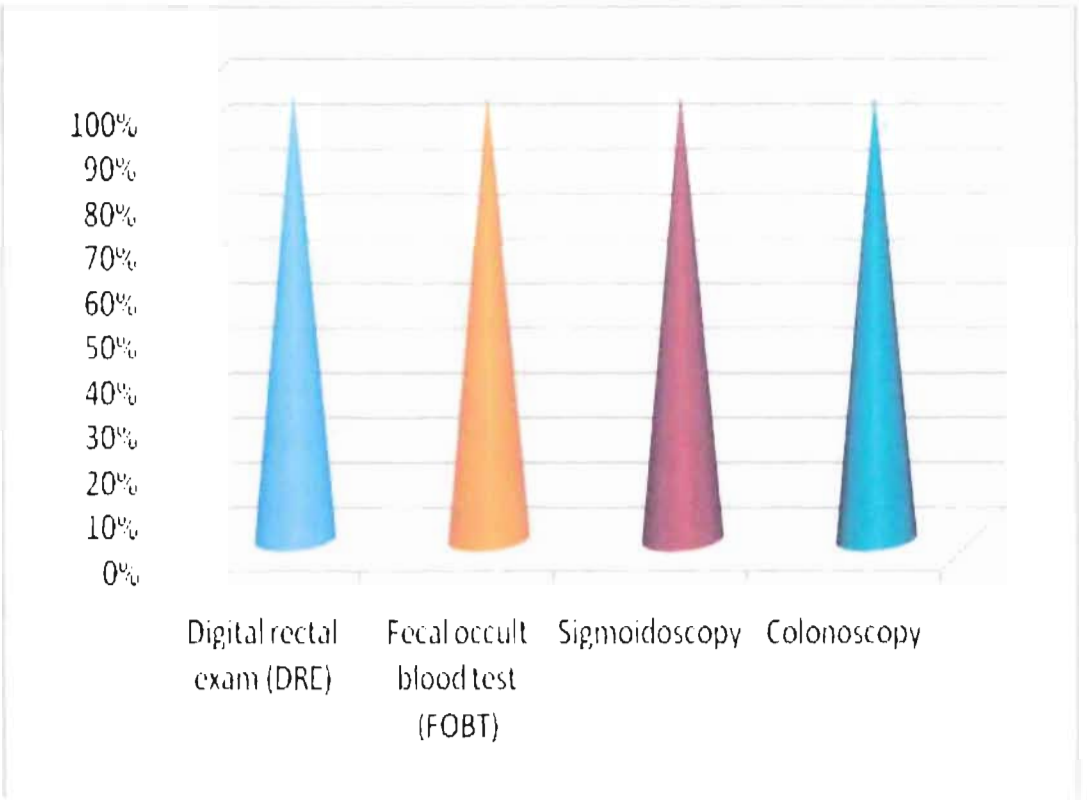


Figure 3.16 Tests for colorectal cancer patients

From the above Table 3.16 & Figure 3.16, it was observed that colorectal cancer was diagnosis by Digital rectal exam (DRE), fecal occult blood test (FOBT), Sigmoidoscopy & Colonoscopy.

3.1.17 Side effects of colorectal cancer treatment

The prevalence of side effects of colorectal cancer treatment was tabulated and graph according to age and a graph was drawn below:

Table 3.17 Side effects of colorectal cancer treatment

Side effects of colorectal cancer treatment	Amount	Percentage
Nausea	13	12.16
Vomiting	15	5.86
Fatigue	11	4.8
Bloody stool	21	18.89
Poor appetite	21	18.89
Diarrhea	10	4.5
Mouth & lip sore	3	1.35
Weakness	16	13.9
Fever	28	19.62
Bleeding	17	14.19

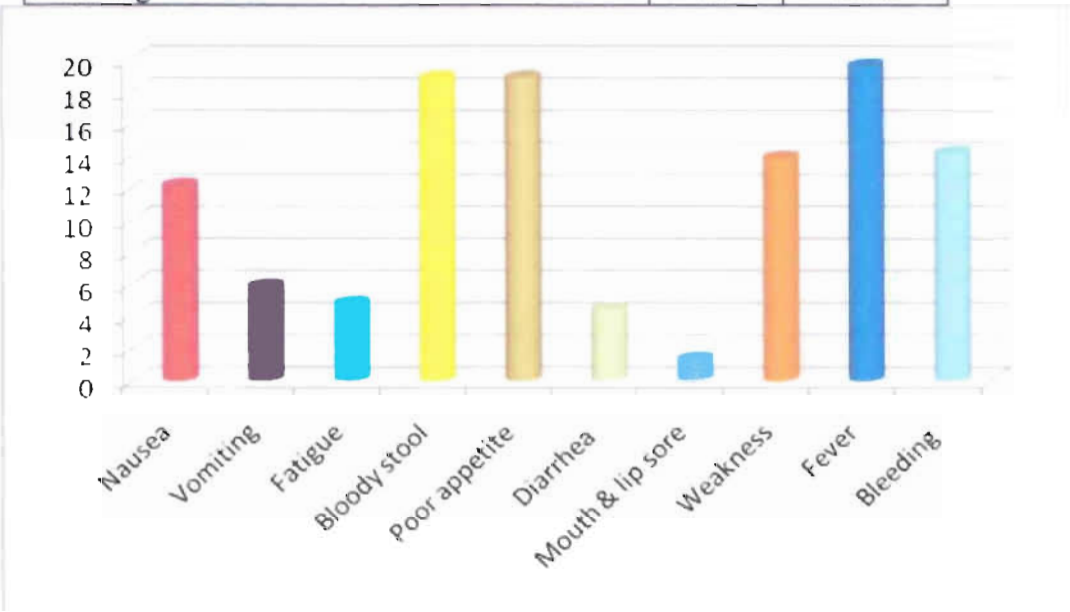


Figure 3.17 Side effects of colorectal cancer patients

From the above Table 3.17 & Figure 3.17, it was observed that colorectal cancer drugs were containing mostly bloody stool (18.89%), Fever (19.62%) & Poor appetite (18.89%) side effects.

3.1.18. Color change of colorectal cancer patients

The prevalence of colorectal cancer in color change was tabulated and graph according to age and a graph was drawn below:

Table 3.18 Color change of colorectal cancer patients

Colors	Amount	Percentage
Change	19	61.29
No change	12	38.71

Figure 3.18 Color changes of colorectal cancer patients

From the above Table 3.18 & Figure 3.18, it was shown that colorectal cancer was change patients color.

3.1.19. Weight of colorectal cancer patients

The prevalence of colorectal cancer in weight was tabulated and graph according to age and a graph was drawn below:

Table 3.19 Weight of colorectal cancer patients

Weight (kg)	Amount	Percentage
<50	0	0
51-60	16	51.61
61-70	14	45.16
70-80	1	3.23
>80	0	0

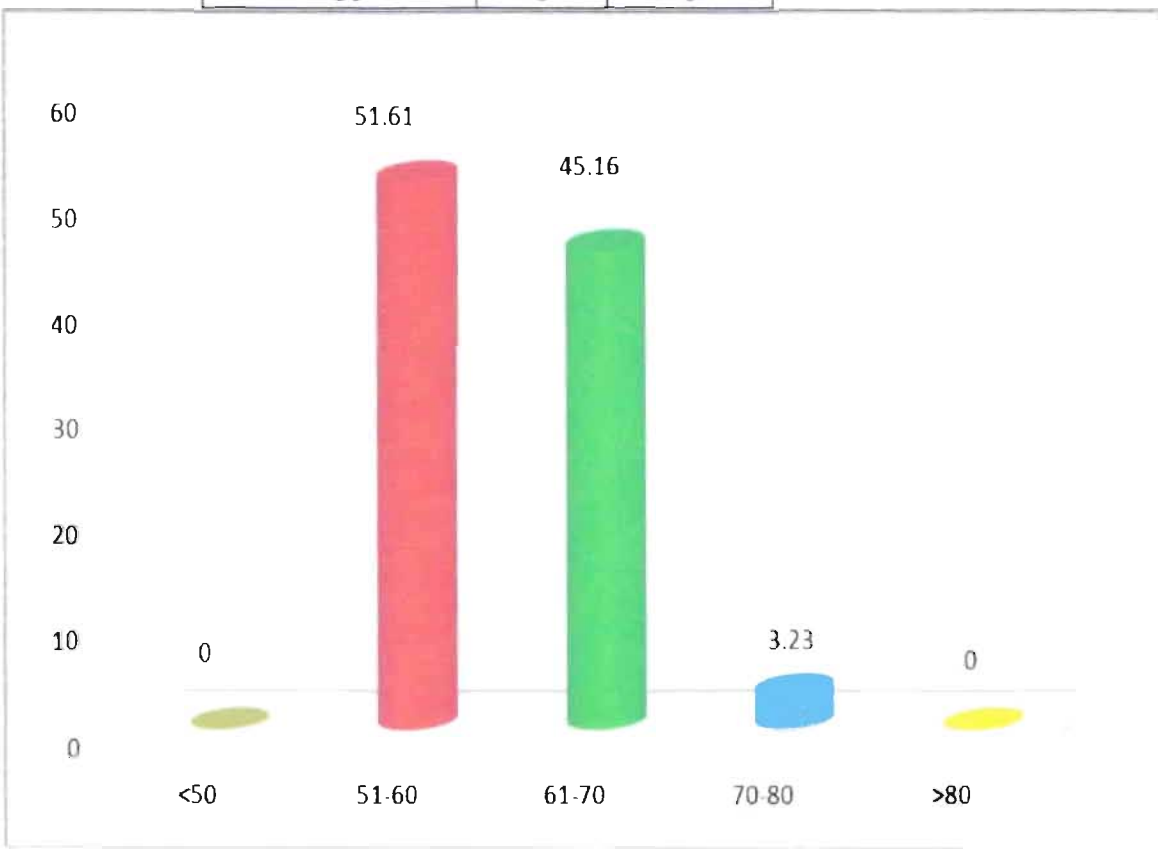


Figure 3.19 Weight of colorectal cancer patients

From the above Table 3.19 & Figure 3.19, it was observed that colorectal cancer was mostly in weight range (51-60%).

3.1.20. Drug patterns of colorectal cancer patients

The prevalence of colorectal cancer in drug patterns was tabulated and graph according to age and a graph was drawn below:

Table 3.20 Drug patterns of colorectal cancer patients

Drugs patterns	Amount	Percentage
Antipsychotics	47	43.1
Antibiotics	29	26.6
Antiulcerent	27	24.8
Anticancer	6	5.5

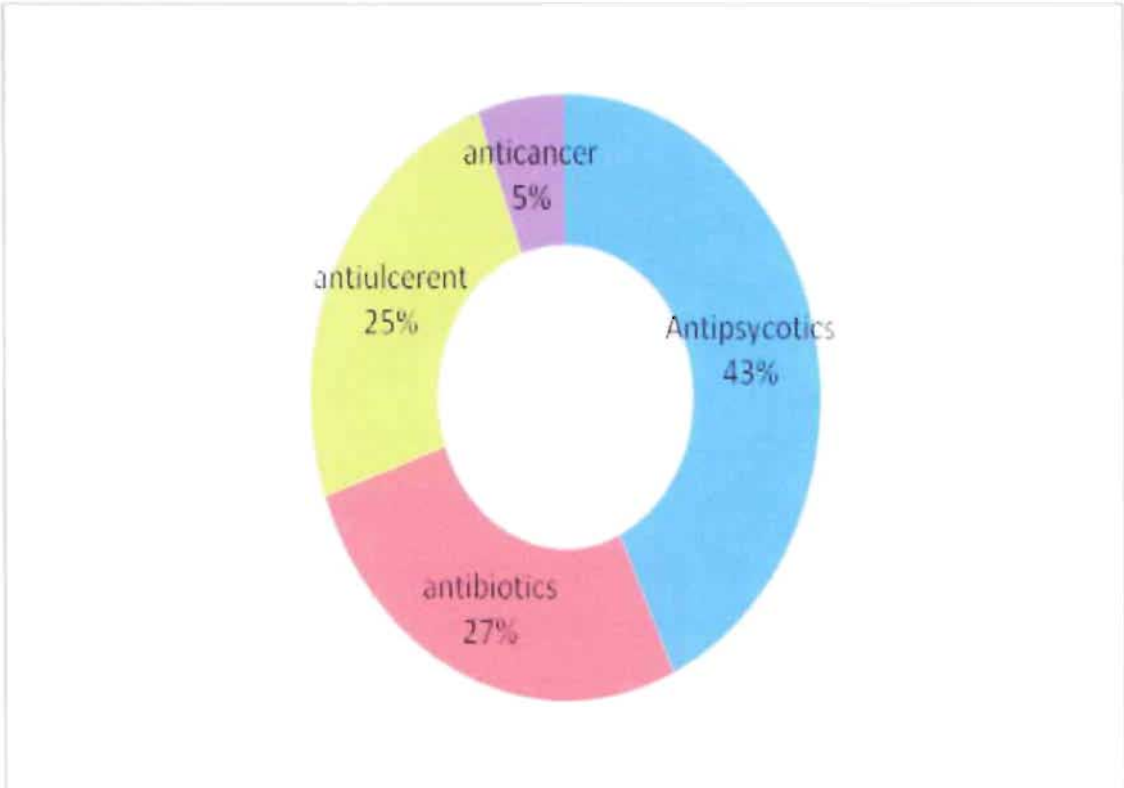


Figure 3.20 Drug patterns of colorectal cancer patients

From the above Table 3.20 & Figure 3.20, it was shown that colorectal cancer patients were mostly treated by antipsychotic (43.1%) drugs.

CHAPTER 04: DISCUSSION & CONCLUSION

4. DISCUSSION & CONCLUSION

In our study we observed 31 patients, in which male were 87.1% (n=27) and the rest were female (12.9%). From this data it can be said, male patients are more prone to female patients. We also compared this result in all the three study centers and found the same results in all the study centers. Due to socioeconomic and religious perspective female patients are not usually coming to diagnose and treat their diseases. That's why there is fewer possibility of getting actual scenario of colorectal cancer affected female patients.

In our study, we observed that married persons (83.87%) are more affected than unmarried (16.13%) patients.

It was observed that 33.26% colorectal affected patients were within the age range 31-40 years & about 22.58 % were within 51-60 years range. It can be concluded from this data that there is higher possibility of having colorectal patients in the age range between 31-40 years and above.

It was observed that 90.32% affected colorectal patients were Muslim & about 9.68% were Hindu. Bangladesh is an Islamic country & 90% of the people are Muslim, so the major part of our patients should be Muslim.

It was shown that a significant portion (48.38%) of patients living in S-urban areas who were affected by colorectal cancer.

It was observed that most of the patients were non smoker (45.16%). So smoking habits is not lead to this disease.

It was shown that the major portion (41.94%) of the affected patients was S.S.C. or equivalently qualified. So if the education level is increase this disease percentage can be reduced.

It was also observed that mostly patients in lower middle classes (58.06%) were affected by Colorectal Cancer. It can be due to that this class people are not much aware about healthcare.

It was observed that colorectal cancer was most prevalent in weight range 51-60kg (51.61%) and in 61-70kg (45.16%) in our country compared to the other age ranges.

It was observed that colorectal cancer was mostly due to ulcerative colitis (28.56%). Most common risk factors include history of ulcerative colitis, chrone'sDiease, polyps, diet, age etc.

It observed that renal and hepatic functions were abnormal in all the patients and also observed the diagnosis system of the colorectal cancer and the side effect after having the treatment.

It also observed that the most usual sign was decreased appetite and feeling of incomplete defecation (11.15%). Other sign and symptoms includes weight loss, fever, constant tiredness, constipation, general abdominal discomfort, blood in the urine, stools that are narrower than usual etc.

We also saw the drugs which were used in the treatment of colorectal cancer. This includes antipsychotic drugs (43.1%), antibiotics (26.6%), antiulcerent (24.8%) and Anticancer (5.5%). Most of the patients were treated by using antipsychotic drugs. Only the stage II patients were treated by using anticancer drugs. Antipsychotic drugs were used due to pain relief and surgery.

In our study we observed that in 61.29% case the patients color and in 83.9% case weight decreased after affecting by colorectal cancer.

From the above discussion it can say the colorectal cancer is not much known disease and its treatment is not also available in Bangladesh. Due too many reasons female are not coming to hospital. Many patients died without diagnosis the disease. So it needs to increase the advertisement and social works related to colorectal cancer. It also needs to increase the education facilities to increase the knowledge of people at that case the prevention, diagnosis and treatment facilities will improve.

CHAPTER 05: REFERENCES

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