BREAST CANCER IN BANGLADESH: DEMOGRAPHIC DETAILS, RISK FACTORS, DIAGNOSTIC PROCEDURES & TREATMENT PATTERN

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Date: 11th October, 2010

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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.

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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 out by Raisa Mahboob (ID: 2007-1-70-029).

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CERTIFICATE

This is to certify that the thesis "Breast Cancer In Bangladesh: Demographic Details, Risk Factors, Diagnostic Procedures & Treatment Pattern" 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 Raisa Mahboob (ID: 2007-1-70-029) under my guidance & supervision so that no part of the thesis has been submitted for any other degree. I further certify that all the sources of information & laboratory facilities availed of this connection is duly acknowledged.

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Abstract

Breast cancer is the most common cancer among women in both the developed and the developing world. In Bangladesh, breast cancer patients are increasing day by day. In our study it was found that out of 30 patients all were female as no male patients were identified in our country till now during the study period. The age distribution of the patients was from 21 – 60 years but 41 – 50 was predominant. Highest no of patients, i.e. 66.67% were living in urban areas & were belonging at lower middle class of families & 70% of the total population were housewives. The common risk factors identified were diet (80%), period at younger age (53.33%) & family history of any cancer (40%). We also found that stage II breast cancer was severely prevalent in our country, i.e. 66.67% with a common symptom of lump in breast & axillary region was shown 100%. 83.33% affected patients were treated with mastectomy followed by radiation therapy at a percentage of 53.33%. The patients were significantly treated with antibiotic ceftriaoxne about 26.67% along with analgesic ketorolac (36.67%), gastrointestinal pantoprazole (66.67%) after their surgery. Radiation therapy was followed by surgery in most of the patients. The common chemotherapeutic combinations were 5 – Flurouracil (FU), Cyclophosphamide & Methotrexate (23.33%). Besides these sedative bromazepam (26.67%), antihistamine desloratidine (26.67%), multivitamin preparation (83.33%), antiemetic domperidone (50%) were also prescribed. 90% patients were suffering from fever after their treatment as a side effect along with poor appetite (73%) whereas 60% patients who were taking chemotherapy were suffering from alopecia.

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Chapter 01: Introduction

1. Introduction

1.1. Cancer

Cancer is the general name for a group of more than 100 diseases in which cells in a part of the body begin to grow out of control. [1] It can affect almost any organ in a person's body like kidneys, lungs, pancreas, throat, brain and dozens more. It occurs due to abnormal proliferation of cells which have uncontrolled growth. These cells have the ability to grow into adjacent tissue and to spread to distant parts of the body. [2] All cancers start from a single cell that undergoes many changes. Some of those changes are permanent alterations to the DNA called mutations. [3]

Normal body cells grow, divide, and die in an orderly fashion. They also divide to replace worn-out or dying cells or to repair injuries. Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells continue to grow and form new, abnormal cells. Cancer cells can also invade (grow into) other tissues, something that normal cells cannot do. Growing out of control and invading other tissues are what makes a cell a cancer cell. [1]

Cancer cells cause problems because they grow and occupy space. They push on other structures and cause them to malfunction. They erode into other structures and bleed. Cancers have no nerves so they do not hurt. They can cause other structures to hurt because of the destruction or pressure on the normal structures. Cancers require energy to grow and rob the body of the energy it needs for normal function. [2]

Cancerous cells are produced by mutated or damaged DNA. DNA is in every cell and directs all its actions. In a normal cell, when DNA gets damaged the cell either repairs the damage or the cell dies. In cancer cells, the damaged DNA is not repaired, but the cell doesn't die like it should. Instead, this cell goes on making new cells that the body does not need. These new cells will all have the same damaged DNA as the first cell does. [1]

The growing mass of cancer cells will eventually become large enough to cause problems and to become detectable. This will produce a lump, mass, or tumor that can be detected. The word oncology means the study of lumps. [2]

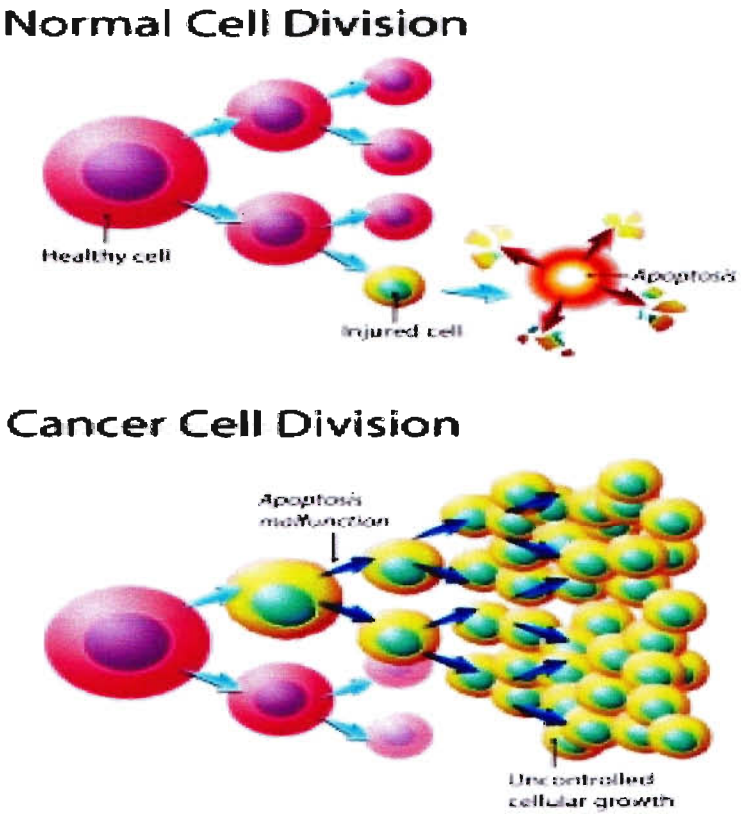

Figure 1.1 Cell division of normal & cancerous cell

A tumor is also known as neoplasm. It is classified as either benign or malignant. A tumor is benign if the out-of-control cell growth does not affect other areas of the body. In other word, though the cells are growing abnormally, still they are not invading other tissues. [4]

A tumor is malignant, however, if these cells have the ability to invade nearby tissues and to travel to distant parts of the body. These malignant tumors are what we call cancer

(malignant neoplasm). A benign tumor is rarely life-threatening, and can often be easily removed. Malignant tumors, though, are far more dangerous and often harder to get rid of. [4]

Malignant tumors are dangerous because they have the ability to invade nearby organs and tissues, spreading the disease as they do so. In addition, cancer cells can sometimes break off from the tumor, entering the person's blood stream. This is how the disease is spread to other organs and this spreading is called "metastasis." [4]

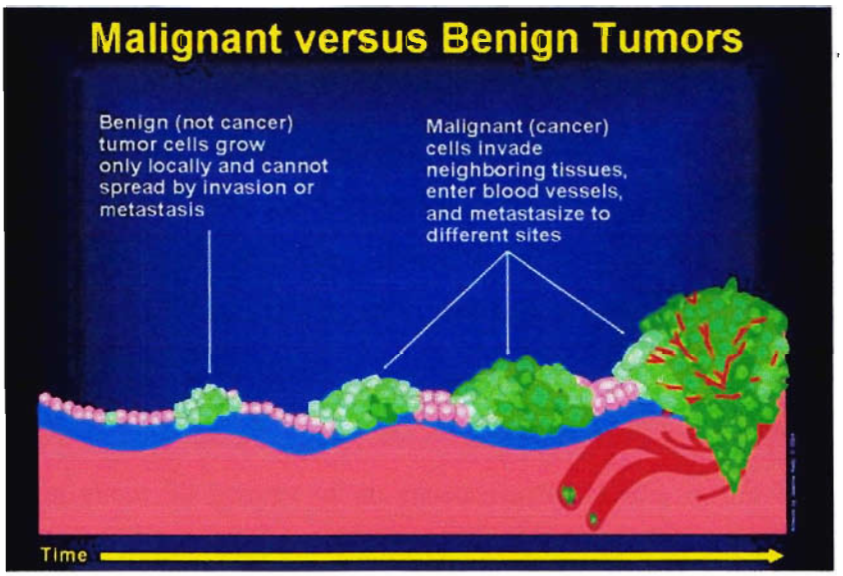

Figure 1.2 Malignant & Benign Tumors

There are several general categories of cancer & are named for the primary site of origin, i.e., skin, colon, breast, brain, etc. If a cancer is found in the liver that originated in the colon it is called colon cancer metastatic to the liver, not a liver cancer. The categories are on following:

- Cancers that arise from epithelial surfaces are called carcinomas. If the surface is a glandular type of surface, then they are called adenocarcinoma's. Carcinomas and

adenocarcinomas are the most common types of cancer. They include lung, breast, prostate, intestinal, skin, ovary, cervix, oral, kidney and bladder.

- Cancers that arise from supporting structures such as bone, muscle, cartilage, fat and fibrous tissues are called sarcomas.
- The third major category is the leukemias and lymphomas. These cancers arise from blood cell elements.
- Brain cancers, nerve cancers, melanomas, and certain testicular and ovarian cancers do not fall into any general category. [2]

1.2. Risk factors of Cancer

Cancers are primarily an environmental disease with 90-95% of cases due to lifestyle and environmental factors and 5-10% due to genetics. Common environmental factors include to cancer death include: tobacco (25-30%) , diet and obesity (30-35%), infections (15-20%), radiation, stress, lack of physical activity, environmental pollutants.[6]

- **Tobacco**

It's estimated that about 30 percent of all cancer-related deaths in the United States are attributable to tobacco. In the case of lung cancer, an astounding 87 percent of the cases are directly linked to tobacco--and most of these to cigarette smoking. It's also connected with kidney, stomach, pancreatic, and other cancers. Anyone who quits smoking almost immediately lowers his chance of getting cancer.

- **Poor diet**

In many forms of cancer, the risk of acquiring the disease seems to go up with wrong eating practices. Therefore it's never a bad idea to remove as much animal fat from your diet as possible, and to start a practice of eating healthy amounts of fruits and vegetables each day.

- **Infections**
    - **Careless Sex**

If a person practices unsafe sex, he is more likely to develop the HPV virus (actually a collection of many viruses), which stands for "Human Papilloma Virus." This then increases the person's chances of getting cervical, vaginal or vulvar cancer. Safe sex leads to a lower cancer risk.

- **Radiation**
    - **Exposure to the Sun**

Ultraviolet rays are not healthy for the skin. Keep in mind that both sunburns and tans are actually signs of skin-cell damage. This can lead to skin cancer, and in worst-case scenarios, to melanoma. These are highly-preventable forms of cancer. A person should acquire the habits of wearing sunscreen outside, and staying indoors between 10 a.m. and 2 p.m. This is when the sun's rays are at their strongest.

- **Physical inactivity**

People who do not exercise or engage in physical activity have a greater risk of getting cancer than those who do. A person who exercises a minimum of 30 minutes each day, five days a week significantly lowers his chance of getting cancer. These exercises could include things such as aerobics, yoga, walking or running.

- **Environment**

If a person is exposed to the wrong substances, he can increase his chances of getting cancer. For instance, asbestos is known to cause several medical problems, including some forms of cancer. By taking himself out of this environment or at least wearing protective clothing, this person in this environment improves his odds.

- **Genetics**

One another most important factors of cancer is Genetics. This is the one area where no one has any control over the risk factor. People with family members who have had a specific kind of cancer, such as breast cancer or melanoma, are more likely to get it themselves. However, even with a family history, the odds of getting the disease are not necessarily high, especially if one can take other preventative measures in the areas that can be controlled. [7]

Cancers are treated by several methods. Surgery to remove the cancer will be curative only if the cancer is in one place and that place can be removed safely with an adequate margin of normal tissue and if the potential for spread elsewhere is low. Radiation is given to treat an entire area. Chemotherapy is used if the entire body is at risk. Often treatments are combined. Treatment is determined by the type of cancer, the grade, stage, location and the biological behavior expected of that particular cancer. Age and overall physical health also need to be considered. The goal of treatment may not necessarily be for cure but for palliation. If the cancer is essentially incurable but is causing problems that can be remedied, then treatment for relief of symptoms is indicated. In this situation quality of life and not longevity is the goal. Treatment is sometimes given even when all the cancer is thought to have been removed. If there is a significant statistical risk that the cancer will reappear later, then prophylactic treatment is given. This is common in breast cancer where chemotherapy or hormonal therapy is given after surgery to try to prevent a recurrence. [2]

1.3. Breast Cancer

Breast cancer (malignant breast neoplasm) is cancer originating from breast tissue. [8] As breast cancer tumors mature, they may metastasize (spread) to other parts of the body. The primary route of metastasis is the lymphatic system which, ironically enough, is also the body's primary system for producing and transporting white blood cells and other cancer-fighting immune system cells throughout the body. Metastasized cancer cells that aren't destroyed by the lymphatic system's white blood cells move through the lymphatic vessels

and settle in remote body locations, forming new tumors and perpetuating the disease process.

Breast cancer is fairly common. Because of its well publicized nature, and potential for lethality, breast cancer is arguably the most frightening type of cancer diagnosis someone can receive. However, it is important to keep in mind that, if identified and properly treated while still in its early stages, breast cancer can be cured.

Breast cancer is not just a woman's disease. It is quite possible for men to get breast cancer, although it occurs less frequently in men than in women. [9] In the U.S., it affects one in eight women. [10]

1.4. Breast anatomy

The breasts are made of fat, glands, and connective (fibrous) tissue. The breast has several lobes, which are divided into lobules that end in the milk glands. Tiny ducts run from the many tiny glands, connect together, and end in the nipple. [11]

Blood and lymphatic vessels are found within the stroma surrounding the lobules and ducts:

- Blood vessels are part of the circulatory system. They supply oxygen and nutrients to and remove waste from the cells of the breast.
- Lymphatic vessels are part of a large network termed the lymphatic system. These vessels collect and carry fluid and cells from the tissues of the body. Smaller lymphatic vessels merge with larger ones, as streams merge into a river. Large vessels empty into grape-like clusters of lymphatic tissue called lymph nodes. The lymphatic vessels in the breast carry lymphatic fluid to a mass of lymph nodes located near the underarm. [12]

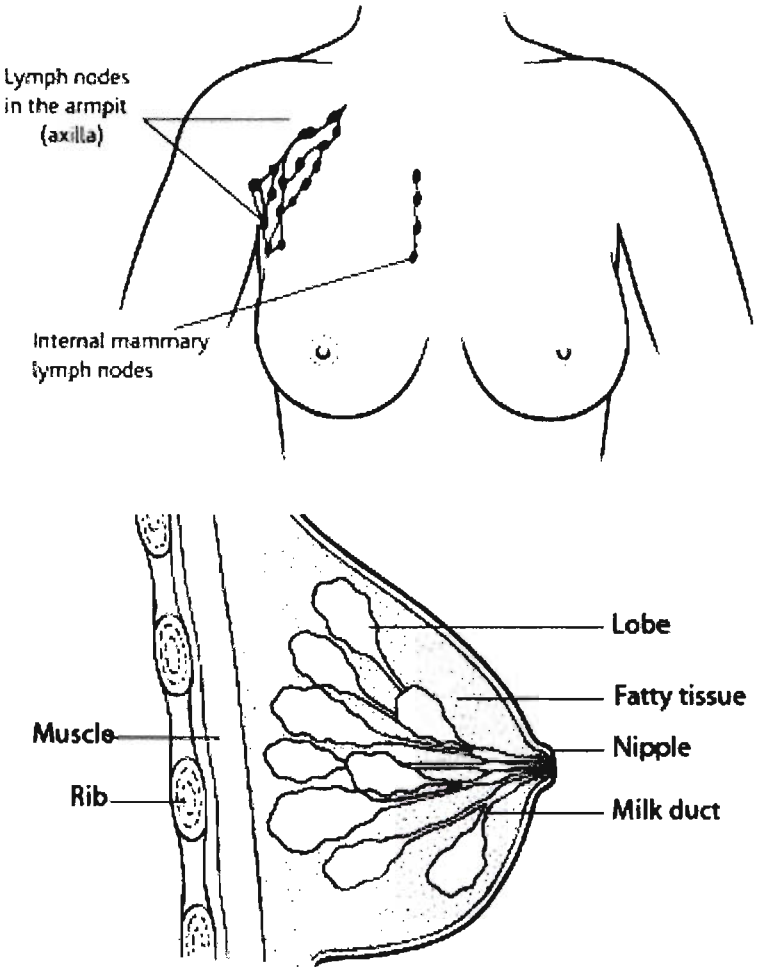

Figure 1.3 Lymph nodes close to the breast, and the structure of the breast

1.5. General classification

Breast cancer is mainly of 2 types:

1. Non – invasive (in situ) breast cancer
2. Invasive breast cancer

1.5.1. Non – invasive (in situ) breast cancer

In situ breast cancer refers to cancer in which the cells have remained within their place of origin; that means they haven't spread to breast tissue around the duct or lobule. [13]

It is again sub – divided into 2 types:

- ✓ **Ductal carcinoma in situ (DCIS)**

DCIS is a condition in which breast cancer cells have developed within some of the breast ducts (the channels in the breast that carry milk to the nipple). The abnormal cells are completely contained within the ducts and have not spread into the surrounding breast tissue. Because the cancer cells have not spread outside of the ducts, DCIS is sometimes referred to as pre-cancerous, pre-invasive, non-invasive, or intraductal cancer.

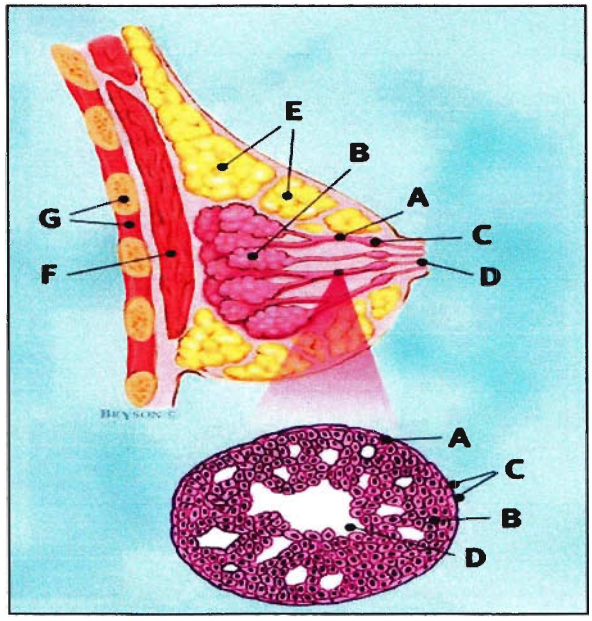

Figure 1.4 Normal breasts with non–invasive ductal carcinoma in situ (DCIS) in an enlarged cross–section of the duct

Here in the figure:

Breast profile describes: **A** = ducts, **B** = lobules, **C** = dilated section of duct to hold milk, **D** = nipple, **E** = fat, **F** = pectoralis major muscle, **G** = chest wall/rib cage

Enlargement shows that: **A** = normal duct cells, **B** = ductal cancer cells, **C** = basement membrane, **D** = lumen (center of duct)

✓ **Lobular carcinoma in situ (LCIS)**

LCIS means that there are changes to the cells lining the lobules (where milk is produced) of the breast. It is not cancer, but it means there is a small increase in the risk of developing breast cancer later. Most women with LCIS will never develop breast cancer or need treatment, but doctors usually will recommend regular breast examinations so that any changes can be recognized early if they do occur. [14]

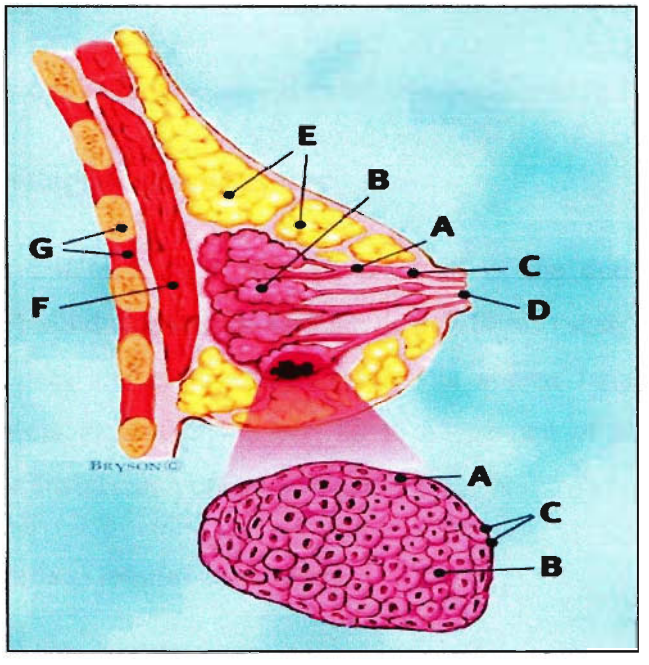

Figure 1.5 Normal breast with lobular carcinoma in situ (LCIS) in an enlarged cross–section of the lobule.

Here in figure:

Breast profile describes: **A** = ducts, **B** =lobules, **C** = dilated section of duct to hold milk, **D** = nipple, **E** = fat, **F** = pectoralis major muscle, **G** = chest wall/rib cage

Enlargement describes: **A** = normal lobular cells, **B** = lobular cancer cells, **C** = basement membrane

1.5.2. Invasive breast cancer

Invasive (infiltrating) breast cancers spread outside the membrane that lines a duct or lobule, invading the surrounding tissues [13] between the ducts, blood vessels, lymph nodes and other structures within the breasts. Because of this type of growth with infiltrating breast cancer, there is more of a chance that the cancer will metastasize, spreading from one site to other parts of the body. [15] They are much more serious than non-invasive cancers. They can spread cancer to other parts of the body through the bloodstream and lymphatic system. [16]

Invasive breast cancer can be further sub – divided into the following 7 types:

- ✓ **Invasive (Infiltrating) ductal carcinoma**

It starts in the duct and may break through the wall of the duct to the fatty tissue surrounding the breast. As the cancer invades the duct, a fibrous scar-like tissue is formed. This scar formation may make the ductal carcinoma appear larger than it really is. According to the American Cancer Society, 80 to 85 percent of all breast cancers are infiltrating or invasive ductal carcinoma.

- ✓ **Invasive (Infiltrating) lobular carcinoma**

It starts in the milk-producing glands. This type of cancer may not appear as a distinct lump, but more like an irregular thickening in the breast. About 10 to 15 percent of invasive breast cancers are invasive lobular carcinomas as indicated by the American Cancer Society.

- ✓ **Tubular carcinoma**

It is a special type of infiltrating ductal breast carcinoma. It is a slow-growing, tube-shaped cancer. The American Cancer Society states about two percent of all breast cancers are tubular carcinomas. Individuals with this type of cancer usually have a slightly better

prognosis and the chance of metastasis is slightly lower than invasive lobular or ductal cancers of the same size.

- ✓ **Medullary carcinoma**

It is a special type of infiltrating ductal cancer due to the fact that there is a relatively defined and distinct boundary between tumor tissue and normal breast tissue. Other special characteristics of this form of breast cancer are the presence of immune system cells at the edges of the tumor and the large size of the cancer cells. This category of cancer accounts for about five percent of all breast cancers according to the American Cancer Society.

- ✓ **Mucinous carcinoma**

It is also called colloid carcinoma. It is a rare type of invasive ductal breast cancer, formed by mucus-producing cancer cells. This form of cancer has a slightly better prognosis and a slightly lower chance of metastasis than invading lobular or ductal cancers of the same size. [15]

- ✓ **Inflammatory breast cancer**

Inflammatory breast cancer is a rare type of breast cancer in which the cancer cells block the tiny channels (lymph vessels) in the skin and tissues of the breast. This causes the breast to become swollen, red and inflamed. The breast may also feel warm and tender to the touch. Chemotherapy is usually the first treatment, often followed by a combination of radiotherapy, hormonal therapy and surgery. About 1 to 2% (1 to 2 in every 100) of all breast cancers is inflammatory breast cancer.

- ✓ **Triple negative breast cancer**

If a patient is diagnosed with breast cancer, a sample of breast tissue will be tested for receptors for the hormones estrogen and progesterone and the protein HER2. Triple negative breast cancers don't have any of these receptors. About 15-20% of women with breast

cancer have this type of breast cancer. It is often treated with a combination of surgery, radiotherapy and chemotherapy.

1.5.3. Paget's disease of the breast

Paget's disease of the breast is a change in the skin of the nipple that usually first appears as a scaly, red rash. Some women may notice an itching or burning sensation, and there may be oozing or bleeding from the nipple or the darker area surrounding it (areola). About 9 in 10 women with Paget's disease of the breast will have an underlying breast cancer. Treatment will depend on whether or not cancer is present, the type of tumor and how much of the breast is affected. [14]

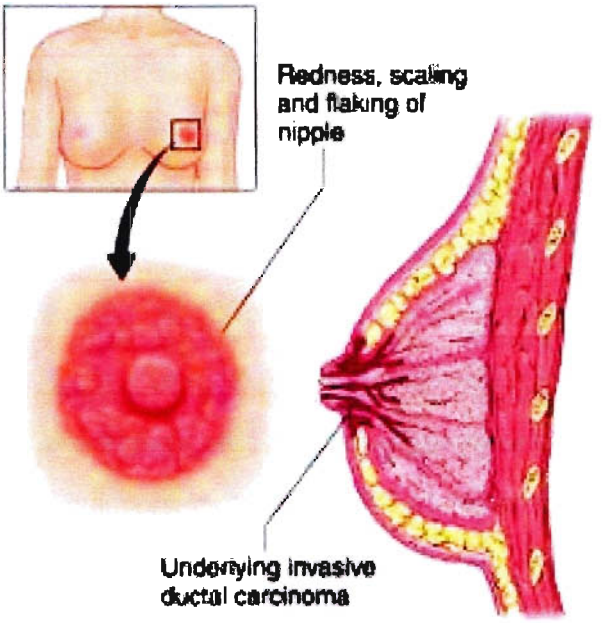

Figure 1.6 Paget's disease of breast

1.6. Molecular classification

Breast cancer profiling can be performed using sophisticated DNA arrangements and large series of genes with frozen tissue or can be evaluated in small series of genes using reverse

transcriptase polymerase chain reaction (RT-PCR) or IHC. Transduction signals and their regulatory systems translate information about the identity of the cell and its environmental state and thereby control the level of expression of genes of the genome. Gene expression analysis by microarray would allow definition of a panel of clinically useful discriminatory genes. Various subtypes of breast cancer were determined by cDNA microarrays, which are differentiated in their pattern of genetic expression and in prognosis a pattern that persists in metastasis.

Based on the presence or absence of genetic expression of the estrogen receptor (ER), breast cancer is divided in two groups:

- **ER+ (Estrogen Receptor Positive)**

  Genetic expression profile has identified 3 possible subtypes of this class named as:

  - Luminal A
  - Luminal B &
  - Luminal C, though the stability of this subtype is still unclear.

Luminal A has a high expression of genes related to ER and low expression of genes related to cellular proliferation compared with luminal B. Subtype luminal A also demonstrated high expression of ER genes. From the clinical characteristics it is found that subtype luminal A is the most frequent, corresponding to 67% of the tumors. Luminal B tumors tend to be of a higher grade.

- **ER– (Estrogen Receptor Negative)**

  Genetic expression profile has identified 3 possible subtypes of this class named as:

  - HER2

Identification of a microarray of an HER2 subtype of breast cancer confirmed that tumors that over expressed HER2 have been systematically differentiated. HER2 designed by microarray should not be confused with HER2+ tumors by IHC or by fluorescence in situ

hybridization (FISH) because in the former they all do not demonstrate changes in RNA expression to define the group. Subtype HER2 by microarray refers to a large group of ER– tumors (low expression of ER and related genes) are identified by genetic expression. The majority of the tumors that are HER2+ by IHC or FISH could fall within the HER2 subtype by microarray. However, other HER2+ tumors exist by IHC or FISH and also could express the hormone receptors. Many of them belong to the luminal subtypes.

- Basal type

Basal subtype is named due to its pattern of expression that is similar to basal epithelial cells and normal myoepithelial cells of mammary tissue. This similarity is a product of the lack of ER expression and related genes, low expression of HER2, intense expression of CK's (cyto keratin) and the gene expression related with cellular proliferation. Using IHC (immunohistochemicals), this subtype has also been called "triple negative" for not expressing ER, PR, or HER2. A simple panel of five antibodies could identify this subtype. It has been defined by IHC as ER–, PR–, HER2– and CKs 5/6 or HER1 positives.

- Normal type:

It may represent only an extension of the expression profile between HER2 and basal type.

These subtypes differ in their biology and both demonstrate short disease-free periods after treatment and poorer outcome. This classification has shown the relationship between cDNA microarrays and clinical outcome of these tumors. This classification is proposed as a method of identifying those patients who will demonstrate better results with the different adjuvant modalities. In the present studies; luminal types A and B, HER2 and basal type is studied exclusively & extensively. [17]

1.7. Causes or Risk factors

The exact cause or causes of breast cancer remain unknown. Yet scientists have identified a number of risk factors that increase a person's chance of getting this disease. Certain risk

factors, such as age, are beyond our control; whereas others, like drinking habits, can be modified.

- **Age & Gender**

The risk of breast cancer increases with age. For example, annual breast cancer rates are 8-fold higher in women who are 50 years old, in comparison with women who are 30. Most breast cancers (about 80%) develop in women over the age of 50. In one age group (40 to 45 years), breast cancer is ranked first among all causes of death in women. Breast cancer is uncommon in women younger than 35, with the exception of those who have a family history of the disease. [18] Women are 100 times more likely to get breast cancer than men. [19]

- **Previous Breast Cancer**

If a woman has already had breast cancer, she has a greater chance of developing a new cancer in the other breast. Such a new, or 'second,' cancer arises from a completely different location and should not be confused with a cancer that has recurred (come back) or metastasized (spread) from another site. The likelihood of a new cancer increases by 0.5% to 0.7% each year after the original diagnosis. After 20 years, a woman has a 10% to 15% chance of developing a new breast cancer.

A previous diagnosis of lobular carcinoma in situ (a localized tumor) is associated with a 10% to 30% greater breast cancer risk and a previous diagnosis of ductal carcinoma in situ is associated with a 30% to 50% greater risk.

- **Family History of Breast Cancer**

Approximately 85% of women with breast cancer do not report a history of breast cancer within their families. Of the remaining 15%, about one-third appears to have a genetic abnormality. The risk of breast cancer is about two times higher among women who have a first-degree relative (mother, sister, or daughter) with this disease. The risk is increased 4- to

5-fold if the relative's cancer was found before menopause (the end of menstruation) and involved both breasts. The risk also is increased if breast cancer occurs in several family generations.

In addition, an increased risk of breast cancer has been found in families with other inherited disorders, such as ataxia telangiectasia (a progressive disease of the motor system) and Li-Fraumeni syndrome.

- **Genetic Mutations**

About 5% to 10% of all breast cancers are hereditary. Scientists have identified certain genetic mutations (permanent changes in genetic material) that place people at increased risk of breast cancer. To date, the genes that have been most studied include BRCA1 and BRCA2. Some American women - many of whom are descendants of Ashkenazi Jews from Eastern and Central Europe - have an inherited BRCA1 mutation. Each will have up to a 90% lifetime risk of developing breast cancer. More than half will be diagnosed with breast cancer by age 50. In some BRCA1 families, there is a likelihood of developing both breast and ovarian cancers. The BRCA2 genetic mutation also is prevalent among families with Ashkenazi backgrounds.

In addition, many other genes may be associated with breast cancer, including the genes named p53, AT, the GADD repair group, the RB suppressor gene, and the HER-2/neu oncogene (a gene that contributes to cancer). Some of these genes directly influence breast cancer risk, whereas others are involved in the general processes of cancer growth and metastasis.

- **Hormones**

Breast cancer risk is increased in women with the longest known exposures to sex hormones, particularly estrogen (female sex hormone). Therefore, breast cancer risk is increased in women who have a history of

- Early first menstrual period (before age 12),
- Late menopause (end of menstruation),
- No pregnancies,
- Late pregnancy (after age 30), or use of
- Birth control pills (the 'Pill;' oral contraceptives - 'OCs').

It should be mentioned that the Pill's exact hazards are difficult to assess, since risk apparently disappears in women who have not used oral contraceptives for more than 10 years.

Estrogen replacement therapy (ERT), also known as hormone replacement therapy (HRT), is used by many older women to relieve the symptoms of menopause. Certain studies indicate that ERT may increase the risk of breast cancer after long-term use (10+ years). Yet there is no official consensus on ERT, because scientists also have found that the increase in breast cancer risk is eliminated within 5 years of stopping ERT. In addition, some researchers have reported an increased risk of breast cancer in women taking estrogen or estrogen plus progestin, whereas others have not. Because of these uncertainties - and the fact that ERT has a number of positive benefits (e.g., lowered risks of bone fractures and heart attack) - a physician should be consulted about risks and benefits before a person uses ERT.

- **Breast Disease (Benign)**

Most benign breast diseases such as non proliferative (not rapidly dividing) fibrocystic "disease" (temporary changes in the breasts that coincide with the menstrual cycle) - do NOT increase the risk of breast cancer. Yet risk is increased when the breast tissue shows specific characteristics, such as

- Complex fibro adenoma (fibrous, benign tumor of glandular tissue),
- Hyperplasia (abnormal increase in cell number), or
- Atypia (abnormal cellular structure).

Moderate or severe hyperplasia alone may increase breast cancer risk by 1.5- to 4-fold; however, when associated with atypia, the risk may be increased as much as 5-fold. If a woman also has a family history of breast cancer in first-degree relatives, her risk may be increased 11-fold.

- **Alcohol Use**

The risk of breast cancer is increased among women who drink. Women who consume one alcoholic beverage a day have a slightly increased risk of breast cancer. By contrast, breast cancer risk is nearly doubled in women who have more than three drinks daily. Although the basis for this association is unknown, there is a recognized relationship between the consumption of more than two drinks a day and an increased level of estrogen in the blood.

- **Radiation Exposure**

A significantly increased risk of breast cancer has been found in women who received radiation therapy in the chest area during childhood or young adulthood. Because of former medical practices (for example, the repeated use of fluoroscopic x-rays to check the lungs for tuberculosis), women over 45 generally have more exposure to radiation than younger women. In addition, an increased risk of breast cancer has been seen in women who were exposed to atomic bomb radiation at Hiroshima and Nagasaki, Japan.

- **Other Potential Risk Factors**

A number of variables are potential, but unproven, risk factors for breast cancer. They include:

  - **Dietary fat**

There are conflicting results concerning the relationship between dietary fat and breast cancer. Many U.S. studies have found no association between the two; however, international findings suggest that breast cancer rates are minimal in countries where the

standard diet is low in fat (particularly animal fat). It is known that fat cells play a role in estrogen production, especially in postmenopausal women. Therefore, being overweight may contribute to risky estrogen exposure in such individuals.

- **Environmental pollutants**

Pollutants - such as pesticides made from organochlorides (organic compounds in which chlorine is bound to carbon) - may add to a person's risk of breast cancer, although research has not definitely established an association with such exposure.

- **Cigarette smoking**

Smoking has not been shown to increase the risk of breast cancer. Yet because smoking increases the risk of so many other cancers - as well as heart disease and lung emphysema - most physicians advise women to quit. In addition, smoking can limit the treatment options of breast cancer patients, since certain types of *reconstructive surgery* cannot be used for women who smoke.

- **Abortion/miscarriage history**

Some studies have reported an increased risk of breast cancer among women who have had induced abortions. Yet a large, more recent survey disputes these findings. When the pregnancy histories of over 16,000 American women were analyzed, there was only a slight risk of breast cancer among those who had experienced either spontaneous miscarriages or induced abortions.

- **Above-average body height/weight**:

Some researchers have suggested that above-average body height/body weight relationships may be associated with an increased risk of breast cancer. For example, the heaviest 10% of women age 50 and older may have up to a 20% higher risk of breast cancer, and the tallest 10% of women age 30 to 49 years may have a 30% higher risk. Such associations are

probably the result of hormonal factors - particularly estrogen levels- in the respective subgroups. [18]

1.8. Sign & symptoms

In its early stages, breast cancer usually has no symptoms. As a tumor develops, the following signs are noted.

- A lump in the breast or underarm that persists after your menstrual cycle; often the first apparent symptom of breast cancer, breast lumps are painless, although some may cause a prickly sensation. Lumps are usually visible on a mammogram long before they can be seen or felt.
- Swelling in the armpit.
- Although lumps are usually painless, pain or tenderness in the breast can be a sign of breast cancer.
- A noticeable flattening or indentation on the breast, which may indicate a tumor that cannot be seen or felt.
- Any change in the size, contour, texture, or temperature of the breast; a reddish, pitted surface like the skin of an orange could be a sign of advanced breast cancer.
- A change in the nipple, such as an indrawn or dimpled look, itching or burning sensation, or ulceration; scaling of the nipple is symptomatic of Paget's disease, a localized cancer.
- Unusual discharge from the nipple that may be clear, bloody, or another color. It's usually caused by benign conditions but could be due to cancer in some cases.
- A marble-like area under the skin.
- An area that is distinctly different from any other area on either breast. [20]

Men get breast cancer, too. Symptoms include:

- Breast lump
- Breast pain and

- Tenderness.

Symptoms of advanced breast cancer may include:

- Bone pain
- Breast pain or discomfort
- Skin ulcers
- Swelling of one arm (next to breast with cancer)
- Weight loss [21]

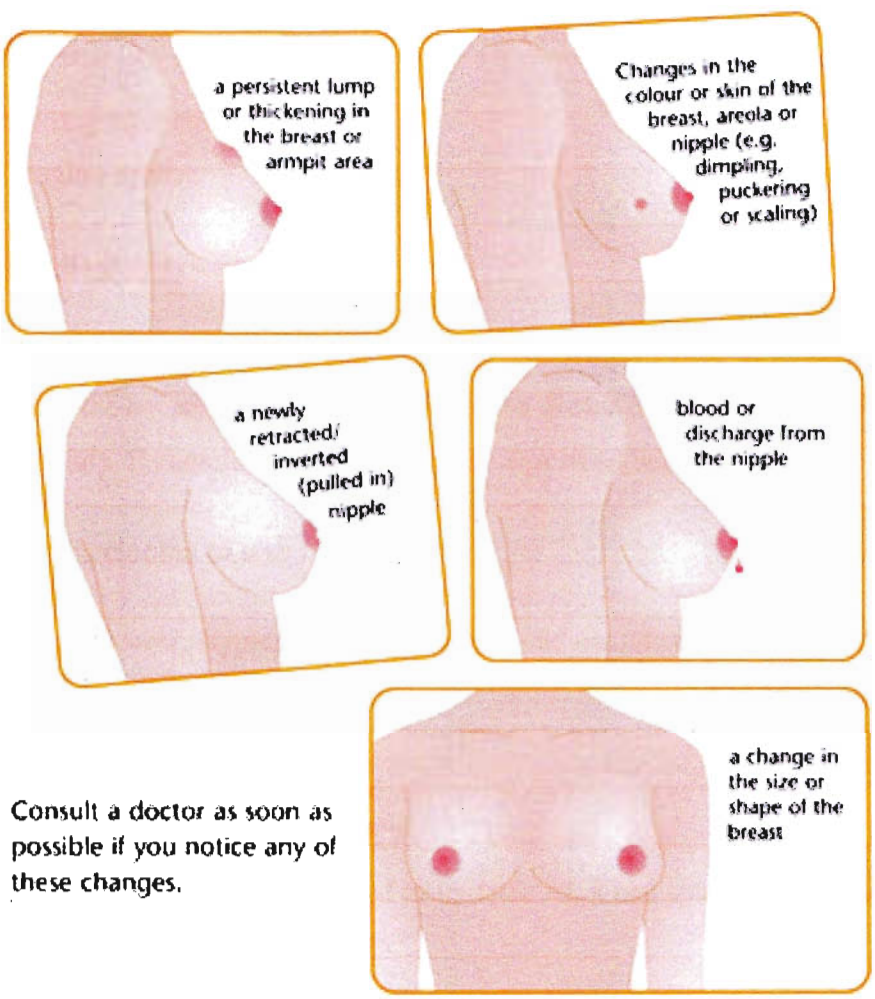

Figure 1.7 Pictorial presentation of the symptoms of breast cancer

1.9. Staging

All breast cancers that have been diagnosed must have other tests performed to determine if the cancer has spread. This process is known as breast cancer staging. Once the stage is known, an appropriate treatment plan can be developed. [22]

Knowing the extent of the cancer and how quickly it is likely to grow (the grade) helps the doctors to decide on the most appropriate treatment and also gives a rough idea of the outlook. [23]

There are 2 ways to do staging of breast cancer which are on following:

1. Number staging system
2. TNM staging system

1.9.1. Number staging system

In number staging system, the cancer status is described with the help of numbers like 0 – 4 so that the state of the cancer is well understood by the doctor & necessary treatments can be followed accordingly. It contains 5 stages which are described below:

- **Stage 0 - Carcinoma in situ**

In stage zero breast cancer, atypical cells have not spread outside of the ducts or lobules, the milk producing organs, into the surrounding breast tissue. Referred to as carcinoma in situ, it is classified in two types:

- Ductal Carcinoma in Situ (DCIS) — very early cancer that is highly treatable and survivable. If left untreated or undetected, it can spread into the surrounding breast tissue.
- Lobular Carcinoma in Situ (LCIS)—not a cancer but an indicator that identifies a woman as having an increased risk of developing breast cancer. [22]

➢ **Stage I— early stage invasive breast cancer**

- The cancer is no larger than two centimeters (approximately an inch) and
- There are no cancer cells in the lymph nodes in the armpit
- The cancer has not spread anywhere else [22] [23]

➢ **Stage II**

Stage 2 breast cancers is divided into two categories according to the size of the tumor and whether or not it has spread to the lymph nodes:

- **Stage II A Breast Cancer**

  Stage II A means

  - The tumor is less than 2 cm, the lymph nodes under the arm contain cancer but are not stuck to each other and the cancer has not spread or
  - The tumor is less than 5 cm, there are no cancer cells in the lymph nodes in the armpit and the cancer has not spread or
  - Although no tumor is seen in the breast, the lymph nodes under the arm contain cancer cells but are not stuck together or to other structures, and there is no sign of spread to other parts of the body.

- **Stage II B Breast Cancer**

  Stage II B means

  - The tumor is less than 5 cm and the lymph nodes under the arm contain cancer cells but are not stuck to each other, and the cancer has not spread or
  - The tumor is bigger than 5 cm across, there are no cancer cells in the lymph nodes in the armpit and the cancer has not spread.

➢ **Stage III**

Stage III breast cancer is divided into 3 groups: stage IIIA, IIIB & IIIC

- Stage III A means
    - Although no tumor is seen in the breast, the lymph nodes under the arm contain cancer cells and are stuck together or to other structures, but there is no sign of cancer spread or
    - The tumor is 5 cm or less, the lymph nodes in the armpit contain cancer cells and are stuck to each other, but the cancer has not spread elsewhere or
    - The tumor is more than 5 cm, the lymph nodes in the armpit contain cancer cells and may be stuck together, but there is no further spread
- Stage III B means
    - The tumor is fixed to the skin or chest wall, the lymph nodes may or may not contain cancer cells, but there is no further spread
- Stage III C means
    - The tumor can be any size and has spread to lymph nodes in the armpit and under the breast bone, or to nodes above or below the collarbone, but there is no further spread

➢ **Stage IV:**

In stage IV breast cancer

- The tumor can be any size
- The lymph nodes may or may not contain cancer cells
- The cancer has spread (metastasized) to other parts of the body such as the lungs, liver or bones

If a patient has cancer cells in the breast and the lymph nodes in her armpit on the same side of the body, then she does not have stage IV breast cancer. Stage IV only applies if the cancer has spread to other body organs or tissues, such as the liver, lungs, brain, skeletal system, or lymph nodes near the collarbone. [22] [23] [24]

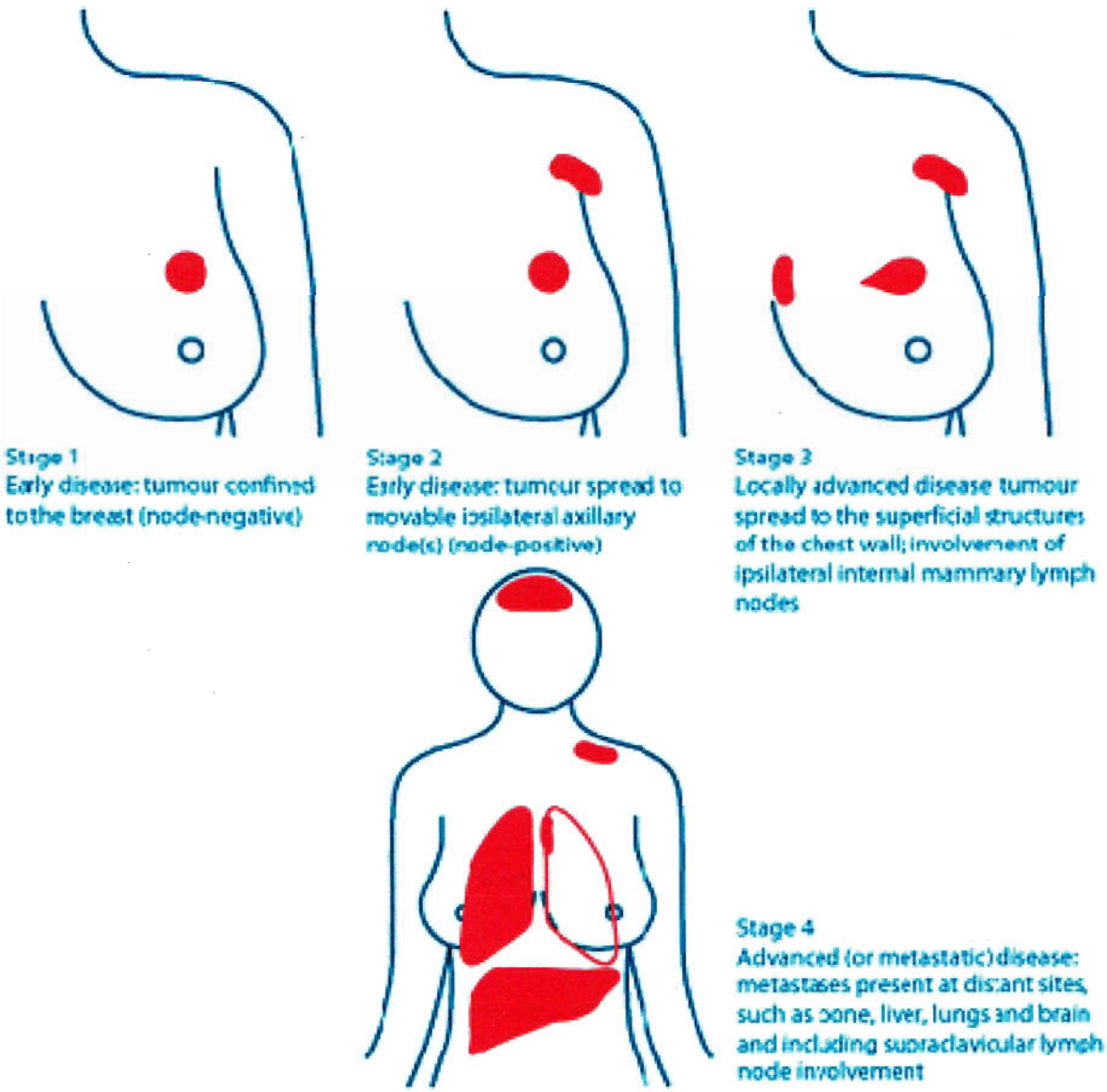

Figure 1.8 Stages of breast cancer

The mortality rate by stage of breast cancer is given below in table 1. This study was carried out by American Cancer Society [25]

Stage	5 – year Relative Survival Rate
0	100%
I	100%
IIA	92%
IIB	81%
IIIA	67%
IIIB	54%
IV	20%

Table 1.1 Breast Cancer mortality rate by stage

1.9.2. TNM staging system

Doctors use a staging system to determine how far a cancer has spread. Another staging system known as the **TNM system** is commonly used. This can give more precise information about the extent of the cancer. [23]

In this system, the cancer is described by three characteristics:

- Size (T stands for tumor)
- Lymph node involvement (N stands for node)
- Whether it has metastasized (M stands for metastasis) [26]

➢ **The T stages (tumor)**

- TX means that the tumor size cannot be assessed

- T1 - The tumor is no more than 2 centimeters (cm) across

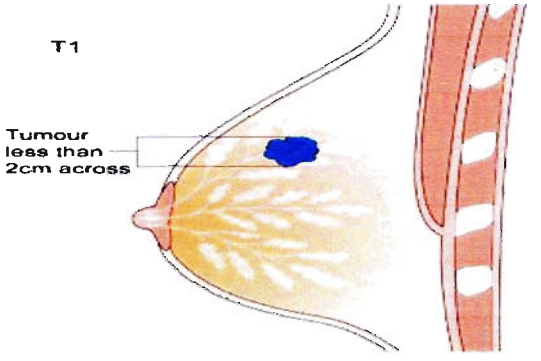

Figure 1.9 Stage T1 breast cancers

T1 is further divided into 4 groups

- T1mic - under a microscope the cancer cells can be seen to spread less than 0.1cm into surrounding tissue (micro invasion)
- T1a - the tumor is more than 0.1 cm but not more than 0.5 cm
- T1b - the tumor is more than 0.5 cm but not more than 1 cm
- T1c - the tumor is more than 1 cm but not more than 2 cm

- T2 - The tumor is more than 2 centimeters, but no more than 5 centimeters across

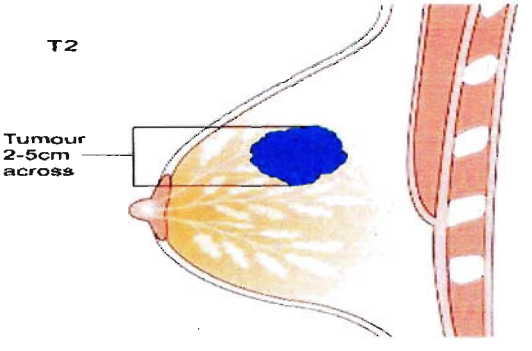

Figure 1.10 Stage T2 breast cancers

- T3 - The tumor is bigger than 5 centimeters across

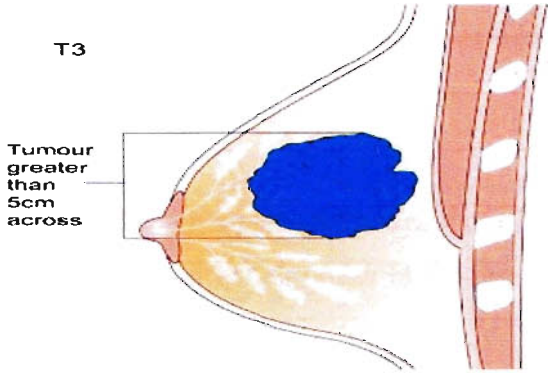

Figure 1.11 Stage T3 breast cancers

- T4 is divided into 4 groups
    - T4a - The tumor has spread into the chest wall
    - T4b - The tumor has spread into the skin
    - T4c - The tumor is fixed to both the skin and the chest wall
    - T4d - Inflammatory carcinoma - this is a cancer in which the overlying skin is red, swollen and painful to the touch

➢ **The N Stages (Nodes):**

- NX means that the lymph nodes cannot be assessed (for example, if they were previously removed)
- N0 - No cancer cells found in any nearby nodes
- N1 - Cancer cells are in nodes in the armpit but the nodes are not stuck to surrounding tissues
- N2 is divided into 2 groups:
    - N2a - there are cancer cells in the lymph nodes in the armpit, which are stuck to each other and to other structures

- N2b - there are cancer cells in the lymph nodes behind the breast bone (the internal mammary nodes). These have either been seen on a scan or felt by the doctor. There is no evidence of cancer in lymph nodes in the armpit

- N3 is divided into 3 groups:

  - N3a - there are cancer cells in lymph nodes below the collarbone
  - N3b - there are cancer cells in lymph nodes in the armpit and under the breast bone
  - N3c - there are cancer cells in lymph nodes above the collarbone

➢ **The M stages (metastases):**

- MX means metastasis can't be measured or found
- M0 - No sign of cancer spread
- M1 - Cancer has spread to another part of the body, apart from the breast and lymph nodes under the arm

How TNM fits together

Doctors usually put these 3 stages together to give an overall stage; which will be written on the patients test forms. So, for example, if a tumor described as T2 N0 M0 then it would be

- A single tumor 2 to 5 cm across
- No evidence of spread to any lymph nodes
- No evidence of spread outside the breast. [27]

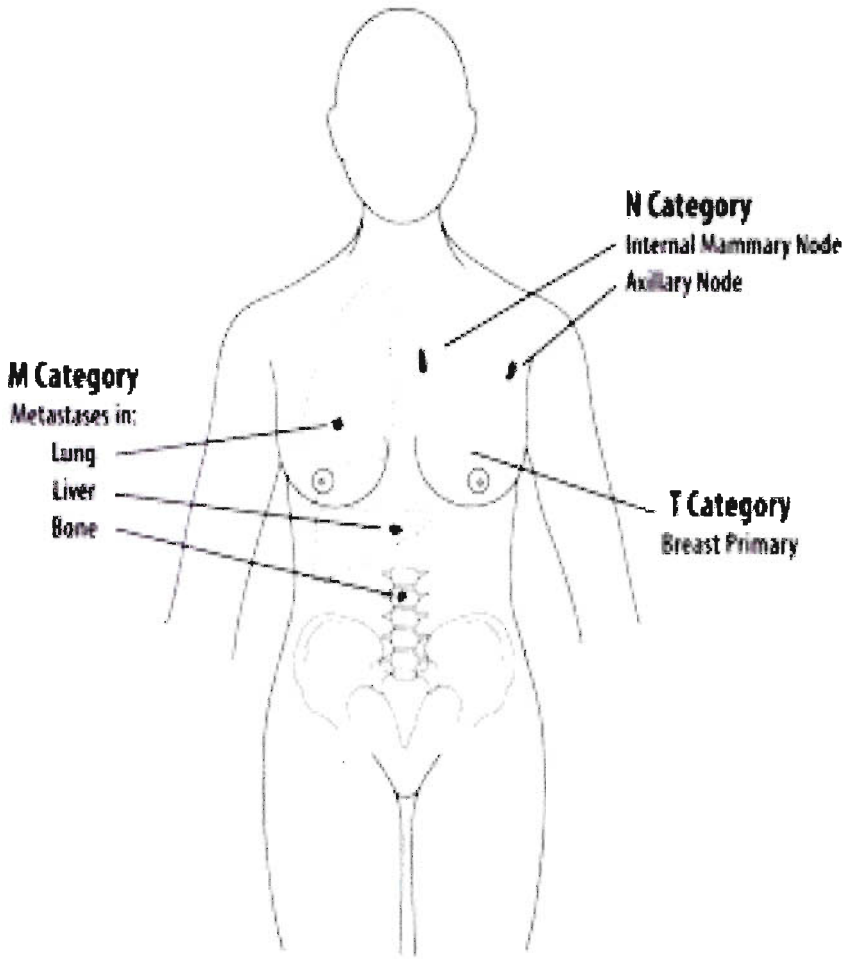

Figure 1.12 TMN staging of breast cancer

1.10. Grading

Grading refers to the appearance of the cancer cells under the microscope. The grade gives an idea of how quickly the cancer may develop.

There are three grades:

- ✓ Grade 1 (low-grade)

  Low-grade means that the cancer cells look very like the normal cells of the breast. They are usually slow growing and are less likely to spread.

✓ Grade 2 (moderate or intermediate grade)

Moderate-grade or grade 2 cancers fall between these two grades and have a level of activity somewhere in between.

✓ Grade 3 (high-grade)

In high-grade tumors the cells look very abnormal. They are likely to grow more quickly and are more likely to spread. [23]

1.11. Pathophysiology

Breast cancer, like other forms of cancer, is the outcome of multiple environmental and hereditary factors. Some of these factors include:

1. Lesions to DNA such as genetic mutations. Mutations that can lead to breast cancer have been experimentally linked to estrogen exposure.
2. Failure of immune surveillance, a theory in which the immune system removes malignant cells throughout one's life.
3. Abnormal growth factor signaling in the interaction between stromal cells and epithelial cells can facilitate malignant cell growth.
4. Inherited defects in DNA repair genes, such as "BRCA1", "BRCA2" and "TP53". People in less-developed countries report lower incidence rates than in developed countries.

In the United States, 10 to 20 percent of patients with breast cancer and patients with ovarian cancer have a first- or second-degree relative with one of these diseases. Mutations in either of two major susceptibility genes, breast cancer susceptibility gene 1 (BRCA1) and breast cancer susceptibility gene 2 (BRCA2), confer a lifetime risk of breast cancer of between 60 and 85 percent and a lifetime risk of ovarian cancer of between 15 and 40 percent. However, mutations in these genes account for only 2 to 3 percent of all breast cancers. [28]

1.12. Diagnosis

The doctor most likely suspects that a patient has breast cancer:

- because a routine screening mammogram showed a problem
- when a patient reports a change in breast or nipple
- after examining breasts and talking with patient about her health, personal and family medical history

If a patient has a lump, the doctor will feel its size, shape and texture and will check to see if it moves easily. Non-cancerous lumps often feel different from cancerous lumps. To confirm the diagnosis, the doctor will arrange special tests. Patient may have one or more of the following tests. [29]

1.12.1. Breast self – exam

The breast self-exam is a way of checking the breasts for changes (such as lumps or thickenings). It includes looking at and feeling the breast. Any unusual changes should be reported to the doctor. When breast cancer is detected in its early stages, then chances for surviving the disease are greatly improved. It should be done every month after the age of 20 even after the period is over. [30]

Breast exams, once thought essential for early breast cancer detection, are now considered optional. While other breast cancer screening tests have been proved to save lives, there's no evidence that breast exams can do this. What's now stressed is breast awareness — being familiar with the normal consistency of your breasts and the underlying tissue, as well as inspecting your breasts for new changes. [31]

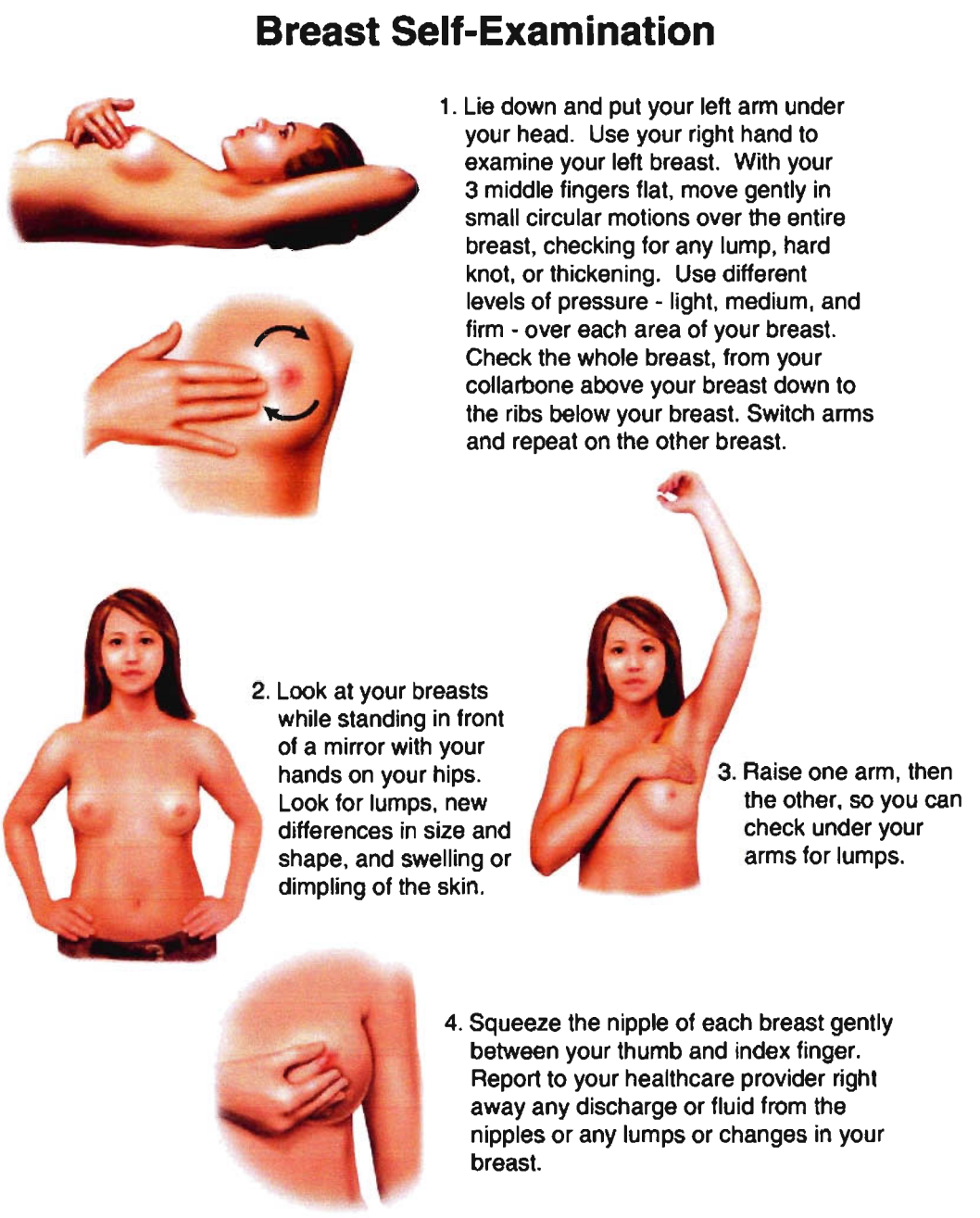

Figure 1.13 Breast Self – Exam (BSE)

1.12.2. Imaging studies

Imaging studies allow tissues, organs and bones to be looked at in more detail. Using x-rays, ultrasounds, CT scans or bone scans, the healthcare team can get a picture of the size of the tumor and see if it has spread. These tests are usually painless and do not require an anesthetic.

A diagnostic mammogram will be done even if a patient already had a screening mammogram. During a diagnostic mammogram, more x-ray pictures will be taken of the areas in the breast that looked abnormal on the screening mammogram. Mammograms can be uncomfortable and may even hurt because the breast is pressed between two glass plates. Patients need to stay still for less than a minute while the pictures are taken.

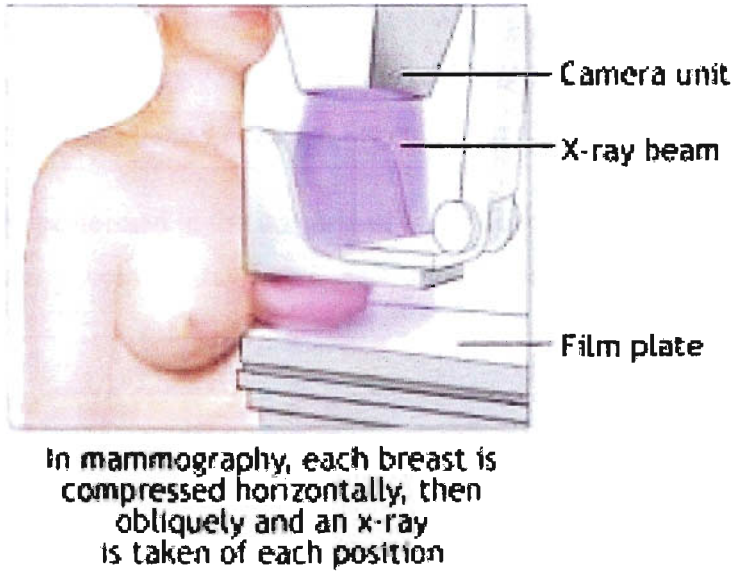

Figure 1.14 Mammogram

1.12.3. Biopsy

A biopsy is usually necessary to make a definite diagnosis of cancer. Cells are removed from the body and checked under a microscope. If the cells are cancerous, they may be

studied further to see how fast they are growing. There are several ways to do a breast biopsy.

- A fine needle aspiration uses a thin needle to remove fluid or cells from the lump. This procedure is quick, but it may be uncomfortable because the breast is so sensitive.
- For a core needle biopsy, doctor inserts a needle through a small cut in the breast to remove one or more samples of breast tissue. If necessary, ultrasound or x-ray imaging is used to guide the needle into the lump. A local anesthetic (freezing) will be used to numb the area. Patients may have some breast tenderness and bruising for a short time afterwards.
- A surgical biopsy is an operation to remove part or all of a breast lump or suspicious breast tissue. There are two types of surgical biopsies.
    - An incisional biopsy takes a sample of a lump or abnormal area.
    - An excisional biopsy takes out the entire lump or all the suspicious tissue.

The biopsy can be performed in the doctor's office or in the hospital as an outpatient, which means patients won't need to stay overnight. A local anesthetic will be used to numb the area.

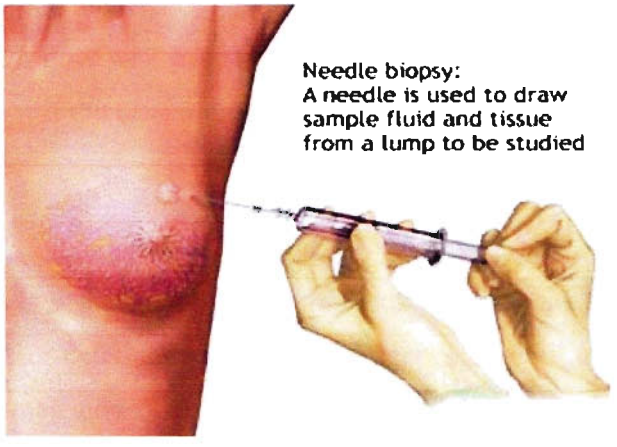

Figure 1.15 Needle biopsy

1.12.4. Laboratory tests

If cancer cells are found in the biopsy sample, doctor may order more laboratory tests on the breast tissue that was removed. These tests help the doctor learn more about the cancer and plan the best treatment options for the patients.

- The hormone receptor status test shows whether the cells have certain hormone receptors. Breast cancer cells that have these receptors need estrogen and progesterone hormones to grow. If the biopsy sample has these receptors, the tumor is called *hormone positive*. Knowing the hormone receptor status of the tumor helps predict how the tumor will behave and whether or not the cancer is likely to respond to hormonal therapy. Hormone-positive tumors are more common in post-menopausal women.
- The Her2 test looks for the cancer gene that controls the Her2 protein. *Her2* stands for human epidermal growth factor receptor 2. *Her2* is a protein on the surface of breast cells that promotes growth. Some breast cancer cells have a lot more *Her2* than others. If the tissue has too much *Her2* protein or too many copies of the gene that controls it, the tumor is called *Her2 positive*. *Her2*-positive breast cancers behave differently than other breast cancers and need specific treatment.
- Sometimes blood tests may be ordered. Blood is taken and studied to see if the different types of blood cells look normal and if they are normal in number. This shows the doctor how well your organs are working and may suggest whether or not there is cancer or if the cancer has spread. [29]

1.13. Treatment

The doctor determines breast cancer treatment options based on the type of breast cancer, its stage, whether the cancer cells are sensitive to hormones, overall health and patient's own preferences. Most women undergo surgery for breast cancer and also receive additional treatment, such as chemotherapy, hormone therapy or radiation.

There are many options for breast cancer treatment and patients may feel overwhelmed as they make complex decisions about their treatment. Seeking a second opinion from a breast specialist in a breast center or clinic is also considered along with talking to other women who have faced the same decision.

The treatments with side effects are on following:

1.13.1. 1. Breast cancer surgery

Operations used to treat breast cancer include:

- **Removing the breast cancer (lumpectomy)**

During lumpectomy, the surgeon removes the tumor and a small margin of surrounding healthy tissue. Lumpectomy is typically reserved for smaller tumors that are easily separated from the surrounding tissue.

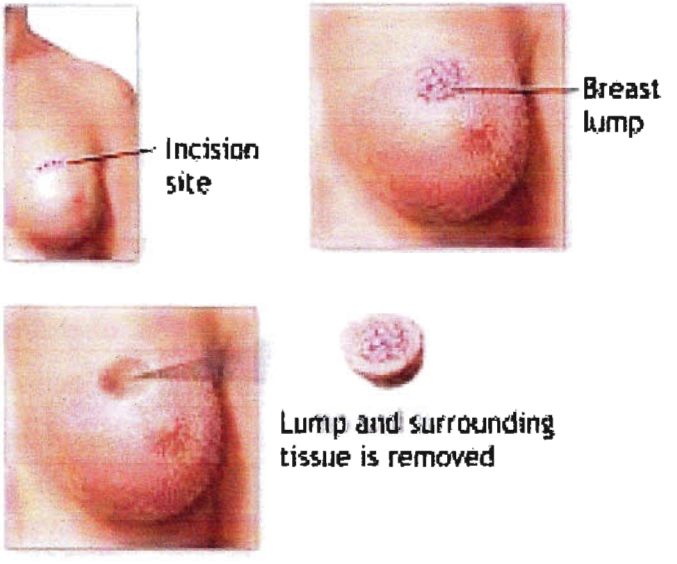

Figure 1.16 Lumpectomy of breast cancer

- **Removing the entire breast (mastectomy)**

Mastectomy is surgery to remove all of breast tissue. Mastectomy can be simple, meaning the surgeon removes all of the breast tissue — the lobules, ducts, fatty tissue and skin, including the nipple and areola. Or mastectomy can be radical; meaning the underlying muscle of the chest wall is removed along with surrounding lymph nodes in the armpit.

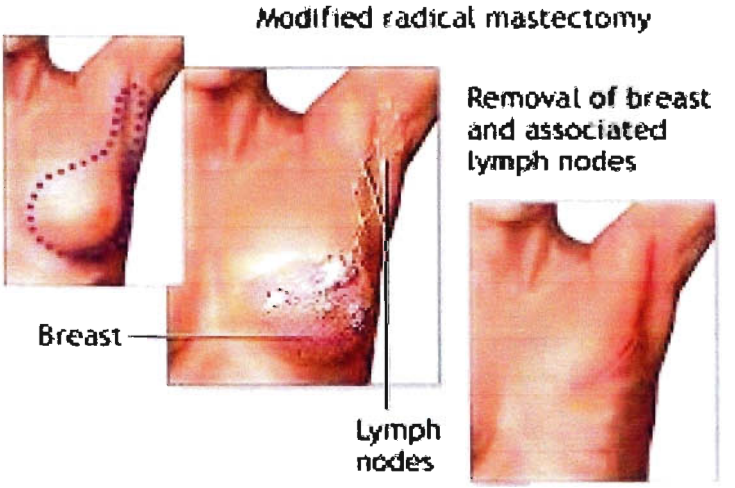

Figure 1.17 Mastectomy of breast cancer

- **Removing one lymph node (sentinel node biopsy)**

Breast cancer that spreads to the lymph nodes may spread to other areas of the body. The surgeon determines which lymph node near the breast tumor receives the lymph drainage from cancer. This lymph node is removed and tested for breast cancer cells. If no cancer is found, the chance of finding cancer in any of the remaining nodes is small and no other nodes need to be removed.

- **Removing several lymph nodes (axillary lymph node dissection)**

  If cancer is found in the sentinel node, then the surgeon removes additional lymph nodes in armpit. Knowing if cancer has spread to the lymph nodes helps determine the best course of treatment, including whether the patients need chemotherapy or radiation therapy.

1.13.1.2. Side effects

Complications of breast cancer surgery depend on the procedures chosen. Surgery carries a risk of bleeding and infection. Surgery to remove lymph nodes increases risk of arm swelling (lymph edema).

1.13.2. 1. Radiation therapy

Radiation therapy uses high-powered beams of energy, such as X-rays, to kill cancer cells. Radiation therapy is typically done using a large machine that aims the energy beams at patient's body (external beam radiation). But radiation can also be done by placing radioactive material inside your body (brachytherapy).

External beam radiation is commonly used after lumpectomy for early-stage breast cancer. Doctors may also recommend radiation therapy after mastectomy for larger breast cancers.

1.13.2.2. Side effects

It includes fatigue and a red, sunburn-like rash where the radiation is aimed. Breast tissue may also appear swollen or more firm. Rarely, more serious problems may occur, including arm swelling (lymphedema), broken ribs and damage to the lungs or nerves.

1.13.3.1. Chemotherapy

Chemotherapy uses drugs to destroy cancer cells. If cancer has a high chance of returning or spreading to another part of body, the doctor may recommend chemotherapy after surgery to

decrease the chance that the cancer will recur. This is known as adjuvant systemic chemotherapy.

Chemotherapy is sometimes given before surgery in women with larger breast tumors. Doctors call this neo adjuvant chemotherapy. The goal is to shrink a tumor to a size that makes it easier to remove with surgery. This may also increase the chance of a cure. Research is ongoing into neo adjuvant chemotherapy to determine who may benefit from this treatment.

1.13.3.2. Side effects

It depend on the drugs is received. Common side effects include hair loss, nausea, vomiting, fever and frequent infections.

1.13.4.1. Hormone therapy

Hormone therapy — perhaps more properly termed hormone blocking therapy — is often used to treat breast cancers that are sensitive to hormones. Doctors sometimes refer to these cancers as estrogen and progesterone receptor positive cancers.

Hormone therapy can be used after surgery or other treatments to decrease the chance of cancer returning. If the cancer has already spread, hormone therapy may shrink and control it.

Treatments that can be used in hormone therapy include:

- **Medications that block hormones from attaching to cancer cells**

Tamoxifen is a type of drug called a selective estrogen receptor modulator (SERM). SERMs act by blocking any estrogen present in the body from attaching to the estrogen receptor on the cancer cells, slowing the growth of tumors and killing tumor cells. Tamoxifen can be used in both pre- and postmenopausal women.

- **Medications that stop the body from making estrogen after menopause**

This group of drugs is called aromatase inhibitors, which block the action of an enzyme that converts androgens in the body into estrogen. These drugs are effective only in postmenopausal women. Aromatase inhibitors include anastrozole, letrozole and exemestane.

- **Surgery or medications to stop hormone production in the ovaries**

In premenopausal women, surgery or medications can shutdown hormone production in the ovaries.

1.13.4.2. Side effects

Side effects of hormone therapy vary according to which medication is received, but typically include menopausal symptoms, such as hot flashes, vaginal dryness, decreased sex drive and mood changes.

Side effects of aromatase inhibitors include joint and muscle pain, as well as an increased risk of bone thinning (osteoporosis).

1.13.5.1. Targeted drugs

Targeted drug treatments attack specific abnormalities within cancer cells. Targeted drugs approved to treat breast cancer include:

- **Trastuzumab**

Trastuzumab targets a protein called HER2 that helps some breast cancer cells grow and survive. If breast cancer cells make too much HER2, trastuzumab may help block that protein and cause the cancer cells to die.

- **Bevacizumab**

Bevacizumab is a drug designed to stop the signals cancer cells use to attract new blood vessels. Without new blood vessels to bring oxygen and nutrients to the tumor, the cancer cells die. Bevacizumab is approved for breast cancer that has spread to other areas of the body.

- **Lapatinib**

Lapatinib targets the HER2 protein and is approved for use in advanced breast cancer. It is reserved for women who have already tried trastuzumab and their cancer has progressed.

1.13.5.2. Side effects

Side effects of targeted drugs depend on the drug is received. Targeted drugs can be very expensive and aren't always being affordable by the patients. [32]

1.14. Previous Study Regarding Prevalence & Treatment of Breast Cancer in Bangladesh

Cancer is the most fatal disease in this world. According to WHO's 1985 report, about five million people die of cancer every year and it is apprehended, after twenty five years this number may rise up to 10 million. Among all the cancers breast cancer is termed as the 'Greatest Killer of Women', between 25 and 50. About 30 % of cancer-suffering women are sufferers of breast cancer and 20% of them die of this deadly disease. [33]

Breast cancer is the most common malignancy in women in Europe and North America. [34] According to the American Cancer Society, over 215,000 women in USA are diagnosed with breast cancer every year; [35] i.e. roughly one in eight women in the U.S. will be diagnosed with breast cancer in her lifetime. [36] There a person over the age of 50 accounts for 75% of breast cancer cases, the cancer is treatable and there is over a 96% five-year

survival rate when breast cancer is caught before it spreads to other parts of the body; [35] and the mortality rate is about 15 %, according to the American Cancer Society. [36] However, even though the incidence of breast cancer is rising in these countries, mortality rate has been decreasing steadily with the advent of management potential. [34]

In case of Bangladesh the accurate statistics are hard to find. This is because here birth and death records are not properly done. Death certificates are generally issued by the hospitals clinics or private physicians, who record causes of the death or names of the diseases. In cases of dying of cancer or breast cancer, just 'cancer' is written, breast cancer is never mentioned. For that reason, it is difficult to know the actual number of women who died of breast cancer. [33]

Moreover, it is not surprising that women in Bangladesh, either in villages or in cities, are the worst breast cancer sufferer owing to shyness, ignorance, social taboos and economic austerity. [34] In a study it was shown that from 1960 to 1986, after cervical cancer the prevalence of breast cancer increased mostly, it increased up to ten-fold. [37] Now, it is estimated that, about 17% of the women suffering from cancer are breast cancer sufferers. One in thousand in Bangladesh is developing cancer in the breast and half of them expire after long suffering. [33]

Recently, according to the International Breast Cancer Research Foundation in Bangladesh, 90 % of the estimated 30,000 women diagnosed with breast cancer die from it. [36] The National Institute of Cancer Research and Hospital in Dhaka reported that among five leading cancers in females the breast cancer's occurrence rate is the second highest, i.e. 24.3% [38]. In another reported by Ohio State professor and Dr. Richard Love in 2006 that every year in Bangladesh approximately 35,000 women develop breast cancer, many of whom never seek treatment. Although the majority of breast lumps ("chakas") are not cancerous and require minimal treatment, some breast lumps require immediate attention. According to Dr. Love, prompt diagnosis and treatment of breast cancer provides the best chance of long-term survival. [39]

Love highlighted in his findings from some of Amader Gram's clinical trials, in which 245 women participated who obviously had or suspected to have breast cancer. Eighty-two of the 245, or 33 %, received treatment of some kind, while the remaining 67 % received no treatment or further evaluations. [36]

The rate of patients reporting their condition is so less and many does not receive treatment mostly because of the religious, sociocultural barriers. The treatment of cancer is also hampered by a shortage of oncologists, as the number in the country is only 98, which is grossly inadequate for the increasing number of cancer patients, according to president of the Bangladesh Cancer Foundation and Associate Professor of NICRH Habibullah Talukder. [38]

Medical facilities in Bangladesh are very meager. There is no health insurance or free health service in Bangladesh. Government officers receive less that 200 taka or 6 Canadian dollars per month as medical allowance. Health service is also confined to limited sphere. There are 1397 government dispensaries mostly in villages for free dispensing service. Government hospitals numbering about 645 are situated in different cities. Apart from hospitals situated in Dhaka, most of the government hospitals provide no cancer treatment. Only one or two hospitals in small towns provide cancer consultancies. There are about 44 TB clinics, but only one hospital for cancer treatment, which is known as 'Cancer Institute and Research Hospital. This cancer hospital, with the co-operation of the Bangladesh Cancer Society, provides outdoor service for mammography and other kinds of breast cancer detection. Number of beds in the cancer hospital is only 50, for all kinds of cancer patients, both male and female. Government hospital beds are either free or paid ones where beds are not easily available. People come from the remote places throngs in the hospital-corridor. According to the Statistical Report (1996), the number of persons per hospital bed is 3,229 and there are 4,866 persons per physician. There is only one mammogram in the Cancer Hospital, but no mammogram machine is available in any other government hospitals. President of the Bangladesh Cancer Society, in his 8th Annual Conference speech gives a grin picture of

cancer treatment in Bangladesh. He feels sorry to see that six Cobalt Machines are lying idle in government hospitals for want of proper technicians.

For this reason, so many private clinics or hospitals have been established in different cities of Bangladesh. Some of the private clinics offer mammography and other detection service. Costs of investigation or treatment are too high to afford for a person of normal means. For any kind of operation in a private clinic, one has to pay a high priced bill.

So, after physical inspection or palpation, if cancer is suspected, the patient and her family face problems concerning treatment and its expenses. If they are residing in villages, they must go to the city hospital. They become scared of hospital expenses. Parents or husband with meager or of little income, cannot cope with this unexpected expenditure. Consequently, treatment is discarded half-way and operations, if necessary, are avoided for fear of big expenses. [33]

However, with proper treatment, 90 % of cervical and breast cancer can be cured, said Talukder. [38]

Incidence of breast cancer is also increasing rapidly in India and it has overtaken cancer of the cervix, statistics reveal. Breast cancer is one of the most common cancers affecting females. Recent Indian Council of Medical Research (ICMR) data shows that the incidence of breast cancer is high among Indian females in the metropolitan cities of Mumbai, Chennai, and Delhi. Although the data available in India is not very reliable, it is estimated that one in 22 Indian females is likely to develop breast cancer during her lifetime in contrast to one in eight in America.

In India we hardly see 5 to 10 % of early breast cancer patients, whereas in developed countries a majority of the patients belong to this group. As a matter of fact, in America, early breast cancer includes only the tumors that are not palpable from the surface but have

been detected by mammography. In India, about 50 % patients of breast cancer are in the locally advanced group.

The size of the tumor at the time of starting treatment is directly related to the ultimate result: a 20-year survival rate is found in more than 90 % of the patients with a tumor diameter of less than 1cm, whereas it comes down to 50 % if the tumor diameter is 3 cm or more. This underlines the importance of early detection of the tumor and it also explains why the outcome is not so good in India. [40]

Even in India, overwhelming the majority of the patients (almost 90%) were from a lower socioeconomic background. Such patients present potential challenges in completion of multimodality treatment and retention to follow-up. [41]

The situation in Pakistan is grimmer than India and our country. Pakistan has the highest rate of breast cancer for any Asian population accounting to 40,000 deaths per year. Approximately 1 in 9 of Pakistani women will suffer from breast cancer at some point in their lives; [42] and in terms of prevalence of breast cancer that stands for 38.5 % of all female cancer patients. [43]

Pakistani women show an incidence rate of 50.1/ 100,000 and the neighboring India with similar socio cultural background of a young age at first child-birth and breast-feeding practices, has an incidence rate of only 19/ 100,000. [44]

It is reported that at least 90,000 women suffer from breast cancer in Pakistan every year, half of 90,000 of these women were in the Punjab alone, and only 10 % of women were diagnosed and that out of them about 75 % women did not treat the problem and die within five years [45]. And the incidence of breast cancer in Karachi, Pakistan is 69.1 per 100,000 with breast cancer presentation in stages III and IV being common. [46]

In overall, very little information is available in Pakistan and only cases at a very advanced stage are reported [42]. Women in their 20s are most vulnerable in Pakistan; [43] this could be due to differences in diet and genetic factors of the people of that region. [44] But, like in any other disease with early diagnosis, a patient's chance of surviving breast cancer is higher than 90%, even in Pakistan. [42]

1.15 Aims and Objectives/ Rationale of the project work

Breast cancer is becoming a leading cancer in our country in women. Its prevalence is increasing in an alarming rate. [47] So women should become more conscious about the harmful effects of this disease.

The objective of the project work is on following:

- ♣ To investigate the present status of breast cancer in our country
- ♣ To make an analysis based on the data collected about the prevalence of breast cancer in our country due to social classes, area of living, education level & profession.
- ♣ To know in details about the breast cancer; i.e. the risk factors, sign & symptoms, types etc to fight against this vulnerable disease
- ♣ To learn about the identification tests & the instruments used in the detection of breast cancer
- ♣ To study in details about the staging & grading systems of breast cancer properly
- ♣ To know about the possible treatment patterns & side effects of the treatment so that some new modification or new ideas can be added for better treatment
- ♣ To learn about the drugs prescribed the oncologist's of our country
- ♣ Finally & most importantly to build up awareness among women of every age & classes after studying the disease in details to lower the rate of its occurrence

Chapter 02: Method & Materials

2. Methods and Materials

2.1. Method

- Number of Study Center: 4 (Four)
- Number of Patients: 30
- Study Site:

Study Center	Name and Contact Address	Number of Patients
1.	National Institute of Cancer Research & Hospital (NICRH). Address: Mohakhali, Dhaka-1212, Bangladesh.	12
2.	Ahsania Mission Cancer Hospital (AMCH) Address: Mirpur 14, Dhaka, Bangladesh	6
3.	Bangabandhu Sheikh Mujib Medical University (BSMMU) Address: Shahbag, Dhaka, Bangladesh	8
4.	Delta Medical College & Hospital Address: Mirpur 2, Dhaka, Bangladesh	4

- Duration of Study: Six (6) Months
- Observation Type: Prospective study.

- Inclusion and Exclusion Criteria

All the patients (Both In and out patients) who underwent treatment at Oncology department of National Institute of Cancer Research & Hospital, Ahsania Mission Cancer Hospital, Bangabandhu Sheikh Mujib Medical University & Delta Medical College & hospital will be included.

- Operational Modality

Indoor (Hospitalized) & outdoor (ambulatory) patients of breast cancer form National Institute of Cancer Research & Hospital, Delta Medical College & Hospital, Bangabandhu Sheikh Mujib Medical University & Ahsania Mission Cancer Hospital will be studied. Information like age, sex, biophysical characteristics, signs and symptoms, causes, types of breast cancer, treatment pattern and drugs prescribed to treat breast cancer, family history, and hematological data will be analyzed by using Microsoft Excel Software.

2.2 Study Protocol

At first we select tertiary care hospitals for study and applied for permission from the Authorized Body (Director / Chairman) of the Oncology Department of the hospital to conduct research work

↓

Then we select indoor & outdoor patients of those hospitals and collected data from them

↓

From collected data we can study various kinds of breast cancer patients in Bangladesh & its treatment pattern

↓

Then data we analyze by using Microsoft Excel

2.3. Volunteer Consent form

I, the undersigned, authorized the research student to consider me as a volunteer for her 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's Name: .....

Volunteer signature and date: .....

Address: .....

Witness: .....

2.4. Data Collection Form

1. Identification of patient

1.1 ID code

1.2 Name

1.3 Father's/Husband's name

1.4 Sex

Male		Female	

1.5 Marital Status

Married		Unmarried	

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

1.7 Mailing address

ph

1.8 Permanent address:

						ph							

1.9 Religion:

1.10 Nationality:

2. Socio-economic condition

2.1 Area of residence

Rural	Urban	S-urban	others

2.2 Education level		2.3 Occupations	
Other		Others	
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	

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

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		

4. Investigation of breast cancer patients

4.1 Patient status

Out patient	
In patient	

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 breast cancer

Stage I	
Stage II	
Stage III	
Stage IV	

4.4 Risk factors

Being a female		
Increasing Age		
Diet (low fruit&vegetable)		
Personal medical history of any cancer		
Family medical history of cancer		
Radiation exposure		
Obesity		
Beginning period at a younger age		
Beginning menopause at an older age		
Having first child at an older age		
Postmenopausal hormone therapy		
Drinking alcohol		
Did not breast feed the baby		
Genetic alteration	Hereditary Breast Cancer Gene 1 (BRCA 1)	
	Hereditary Breast Cancer Gene 2 (BRCA 2)	

4.5 Sign & symptoms of breast cancer

A breast lump or thickening that feels different from the surrounding tissue		Peeling or flaking of the nipple skin	
Bloody discharge from the nipple		Redness or pitting, swelling and increased warmth in the affected breast	
Any change in the size, contour, texture, or temperature of the breast		Changes to the skin over the breast, such as dimpling or puckering	
Inverted nipple		Crusting or scaling on the nipple is symptomatic of Paget's disease, a localized cancer.	

4.6 Diagnosis of breast cancer

4.6.1 Tests for breast cancer

Breast Self-Exam (BSE)		Chest X ray	
Mammogram		HER-2 gene test	
Breast ultrasound		Computerized tomography (CT) scan	
Breast magnetic resonance imaging (MRI)		Positron emission tomography (PET) scan	
Removing a sample of breast		Bone scan	

cells for testing (biopsy)			
Minimally Invasive Breast Biopsy		FNAC	
Sentinel Node Biopsy		FISH Test (Fluorescence In Situ Hybridization)	
Molecular Breast Imaging		IHC Tests (ImmunoHistoChemistry)	
Oncotype DX		Thermography	

4.6.2 Hematology

	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 breast cancer

4.7.1 Types of Treatment

<table>
<tr><td rowspan="4">Surgery</td><td>1. Removing the breast cancer (lumpectomy)</td><td></td><td rowspan="4">Hormone therapy</td><td>Medication that block hormones from attaching to cancer cells</td><td></td></tr>
<tr><td>2. Removing the entire breast (mastectomy)</td><td></td><td>Medications that stop the body from making estrogen after menopause</td><td></td></tr>
<tr><td>3. Removing one lymph node (sentinel node biopsy)</td><td></td><td rowspan="2">Surgery or medication to stop hormone production in the ovaries</td><td rowspan="2"></td></tr>
<tr><td>4. Removing several lymph nodes (axillary node dissection)</td><td></td></tr>
<tr><td colspan="2">Chemotherapy</td><td></td><td colspan="2">Adjuvant Chemotherapy</td><td></td></tr>
<tr><td colspan="2">Radiotherapy</td><td></td><td colspan="2">Palliative chemotherapy</td><td></td></tr>
</table>

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 breast cancer treatment

Nausea		Poor appetite	

Vomiting		Premature menopause	
Fatigue		Mouth & lip sore	
Bloody stool		Chills	
Alopecia/ hair loss		Weakness	
Infection		Fever	
Change in skin		Bleeding	
Red sun – burn like rash		Arm swelling (lymphedema)	
Broken ribs & damage to the lung or nerves		Hot flashes	
Vaginal dryness		Decreased sex drive & mood changes	
Joint & muscle pain		Increased risk of bone thickening (osteoporosis)	

Investigated by:

Name: Signature: Date:

Chapter 03: Results

3. Results

In our study 30 patients suffering from breast cancer were randomly from four different study centers during six months study period according to method discussed earlier.

3.1 Sex variation of breast cancer patients

30 patients includes male (n = 0) & female (n = 30). The prevalence of breast cancer according to sex variation was tabulated & shown by graph as follow:

Table 3.1 Sex variation of breast cancer patients

Sex	Male	Female
No. of Patients (N) = 30	0	30
Prevalence (%)	0	100

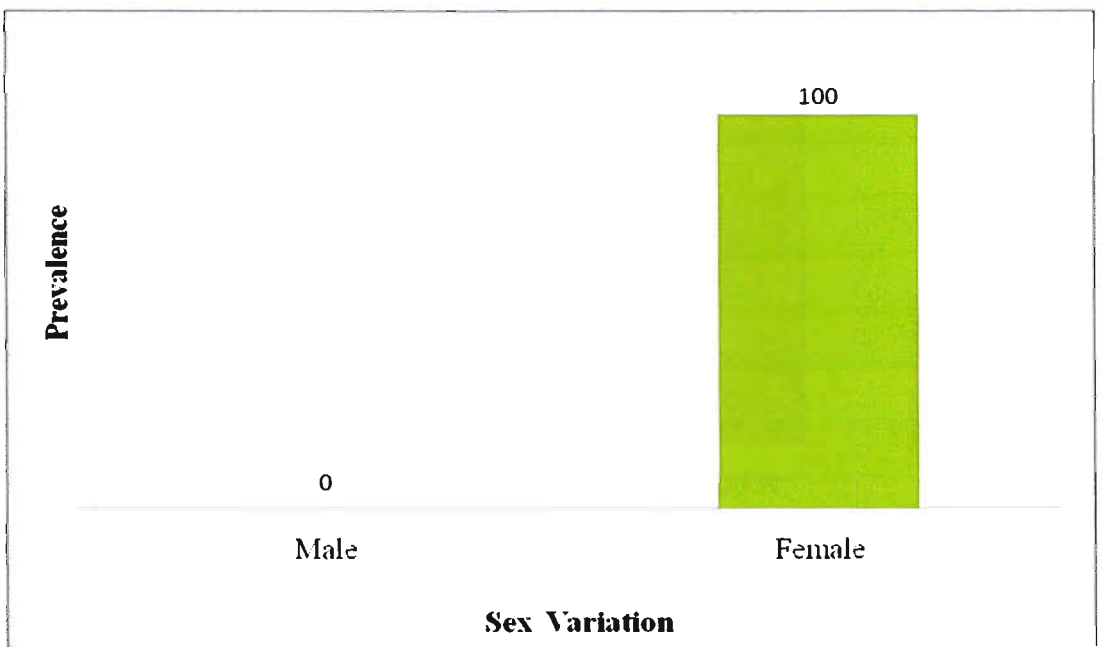

Figure 3.1 Sex variations of breast cancer patients

From the Table 3.1 & Figure 3.1, it was observed that 100% affected patients were female and no male were found suffering from breast cancer in our study period. In another survey conducted in USA and UK, a few male breast cancer patients were also found along with female patients. [48]

3.2 Prevalence of breast cancer in four study centers

Among the randomly selected patients 30 were female in four study centers which include PG (n = 8), AMCH (n = 6), NCIRH (n = 12) & DMCH (n = 4). The prevalence of breast cancer in female according to study center type was tabulated & shown by grapy as follow:

Table 3.2 – Prevalence of female in four centers

Study Center	PG	AMCH	NCIRH	Delta
No. of Patients (N) = 30	8	6	12	4
Prevalence (%)	26.67	20.00	40.00	13.33

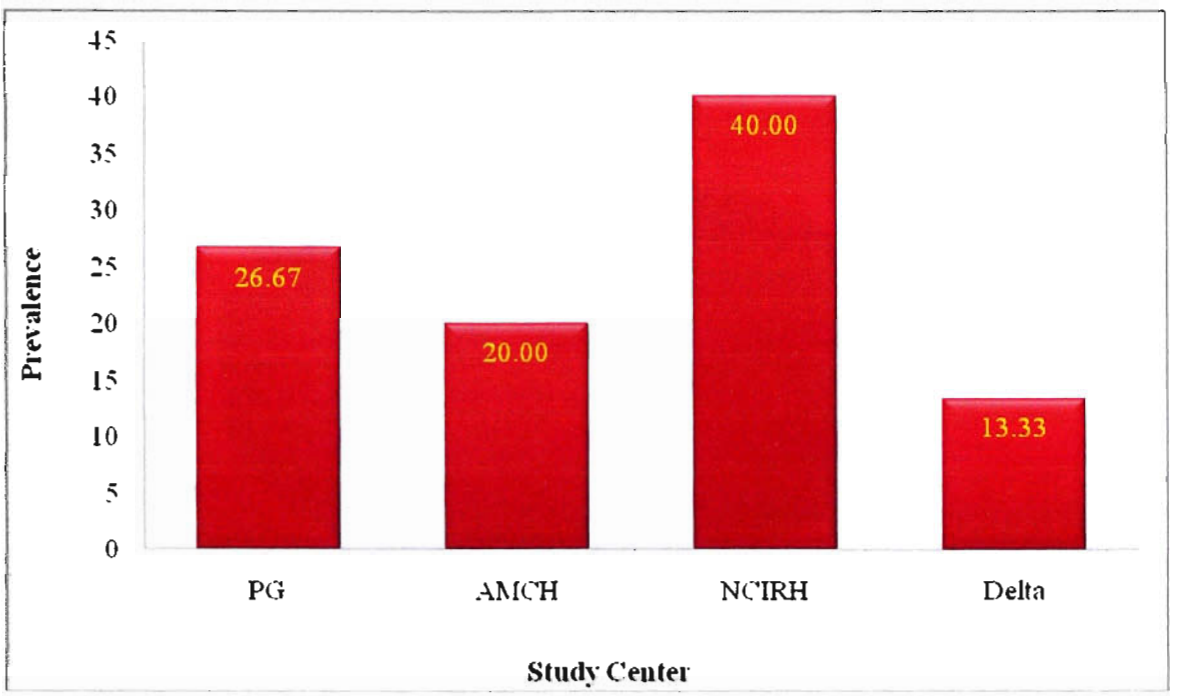

Figure 3.2 – Prevalence (%) of female in four centers

From the above Table 3.2 & Figure 3.2, it was observed that 26.67% affected female were admitted in PG, 20% were in AMCH, 40% were in NCIRH & 13.33% were in DMCH.

3.3 Marital status of patients

Among the randomly selected 30 female patients marital status of the patients were observed which include married (n = 27) & unmarried (n = 3). The prevalence of breast cancer in female according to marital status type was tabulated & shown by graph as follow:

Table 3.3 – Prevalence of breast cancer due to marital status

Marital Status	Married	Unmarried
No. of Patients (N) = 30	27	3
Prevalence (%)	90	10

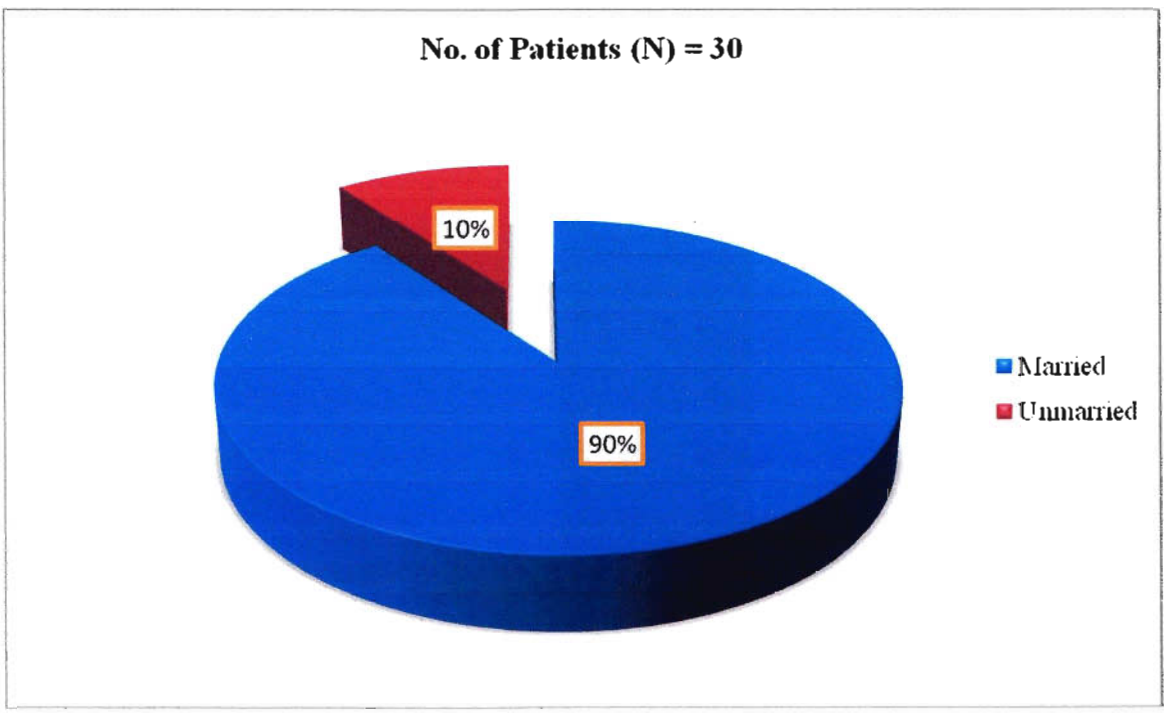

Figure 3.3 – Prevalence (%) of breast cancer due to marital status

From the above Table 3.3 & Figure 3.3, it was observed that 90% affected patients were married whereas only 10% patients were unmarried.

3.4 Place of living of patients

Breast cancer affected patients are lived in different areas that are presented in the following table & graph 3.4

Table 3.4 Place of living of breast cancer patients

Area of Residence	Rural	Urban	S-urban
No. of Patients (N) = 30	1	20	9
Prevalence (%)	3.33	66.67	30.00

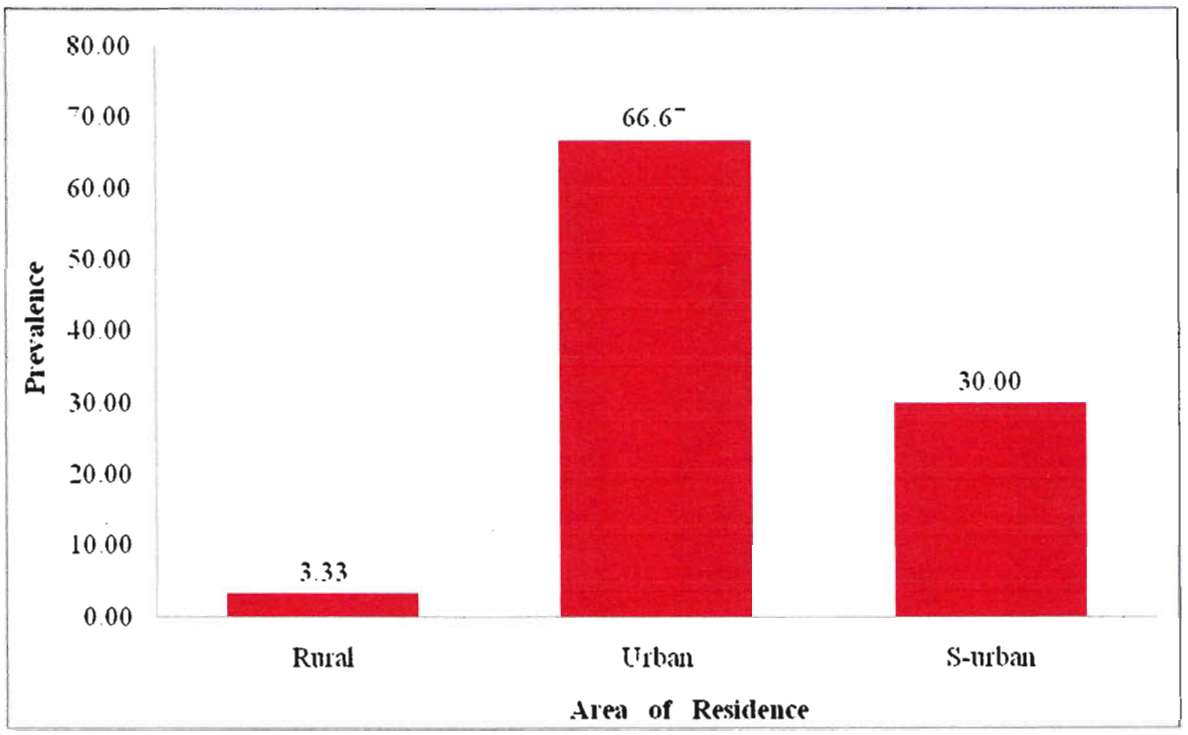

Figure 3.4: Place of living of breast cancer patients

From this Table 3.4 & Figure 3.4, we can see that significant portions (66.67%) of patients living in urban areas (20%) were mainly affected by Breast Cancer.

3.5 Education levels of patients

Education level of the patients were observed & presented in the following Table 3.5

Table 3.5 – Education level of Breast Cancer affected patients

Education Level	Illiterate	Can read only	Can write a letter	SSC or equivalent	HSC or equivalent	Graduate or higher
No. of Patients (N) = 30	3	2	7	6	7	5
Prevalence (%)	10	6.7	23	20	23.33	16.67

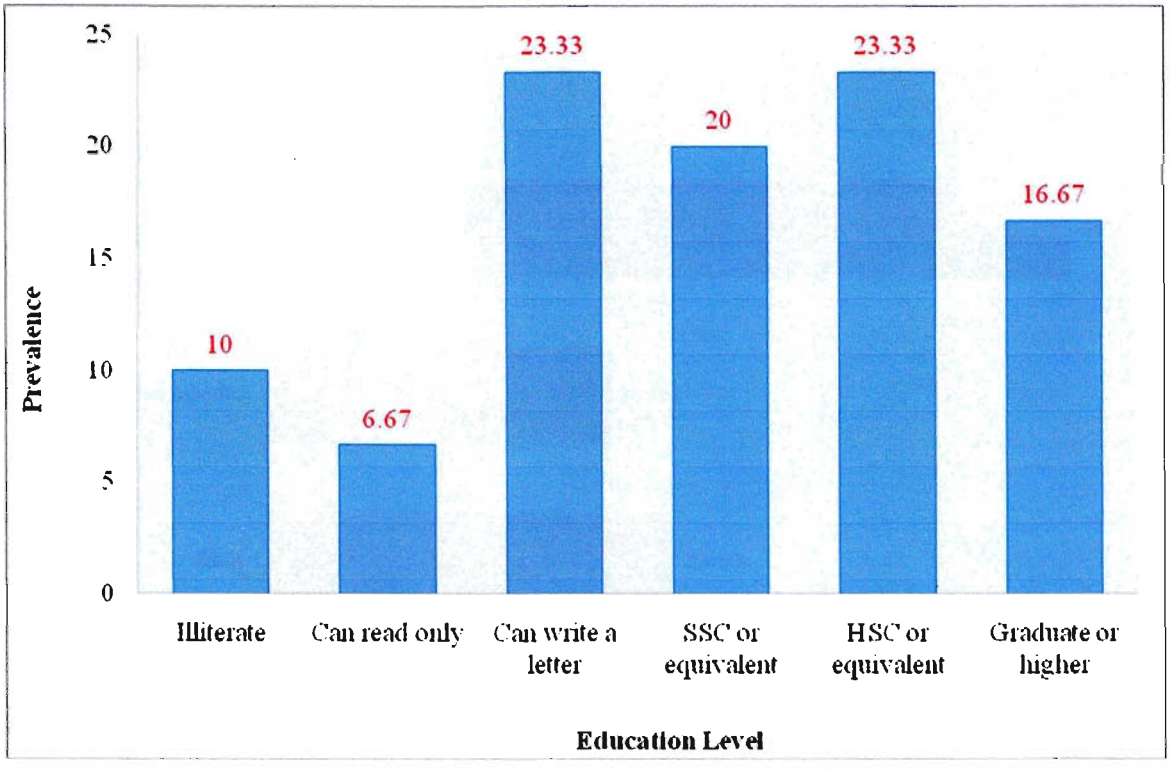

Figure 3.5 – Education level of Breast Cancer affected patients

From the above Table 3.5 & Figure 3.5, we can see that the major portion (23.33%) of the affected patients were either can write a letter or HSC or equivalently qualified.

3.6 Social status of patients

Social class of breast cancer affected patients were different that are presented in the following Table 3.6

Table 3.6 – Social status of breast cancer patients

Social Status	Rich	Upper middle	Lower middle	Poor
No. of Patients (N) = 30	7	6	14	3
Prevalence (%)	23.33	20.00	46.67	10.00

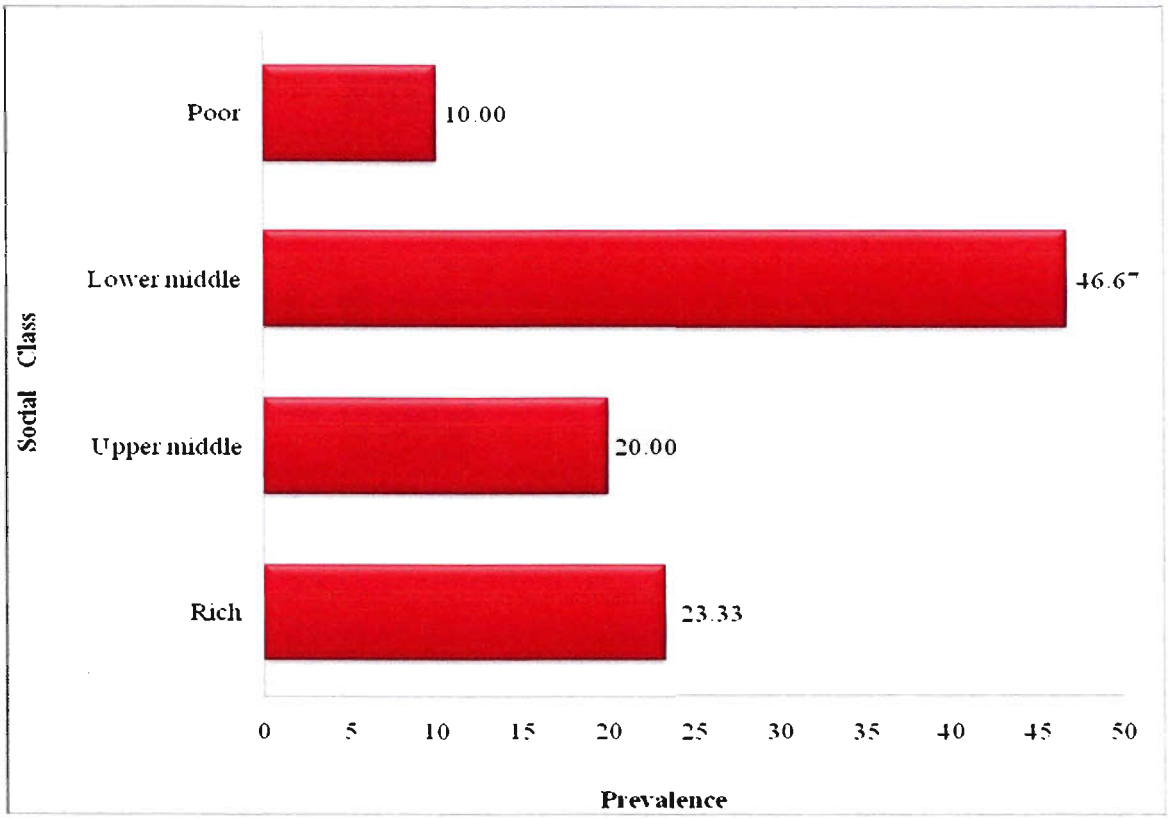

Figure 3.6 – Social status of breast cancer patients

From this Table 3.6 & Figure 3.6, we can see that mostly patients who lived in lower middle classes (46.67%) are affected by Breast Cancer.

3.7 Occupation

Occupation of Breast Cancer affected patients are different that are presented in the following table 3.7

Table 3.7 – Occupation of Breast Cancer patients

Occupation	No. of Patients (N) = 30	Prevalence (%)
Professional/managerial/business	5	16.67
Skilled worker	1	3.33
Housewife	21	70.00
Others	3	10.00

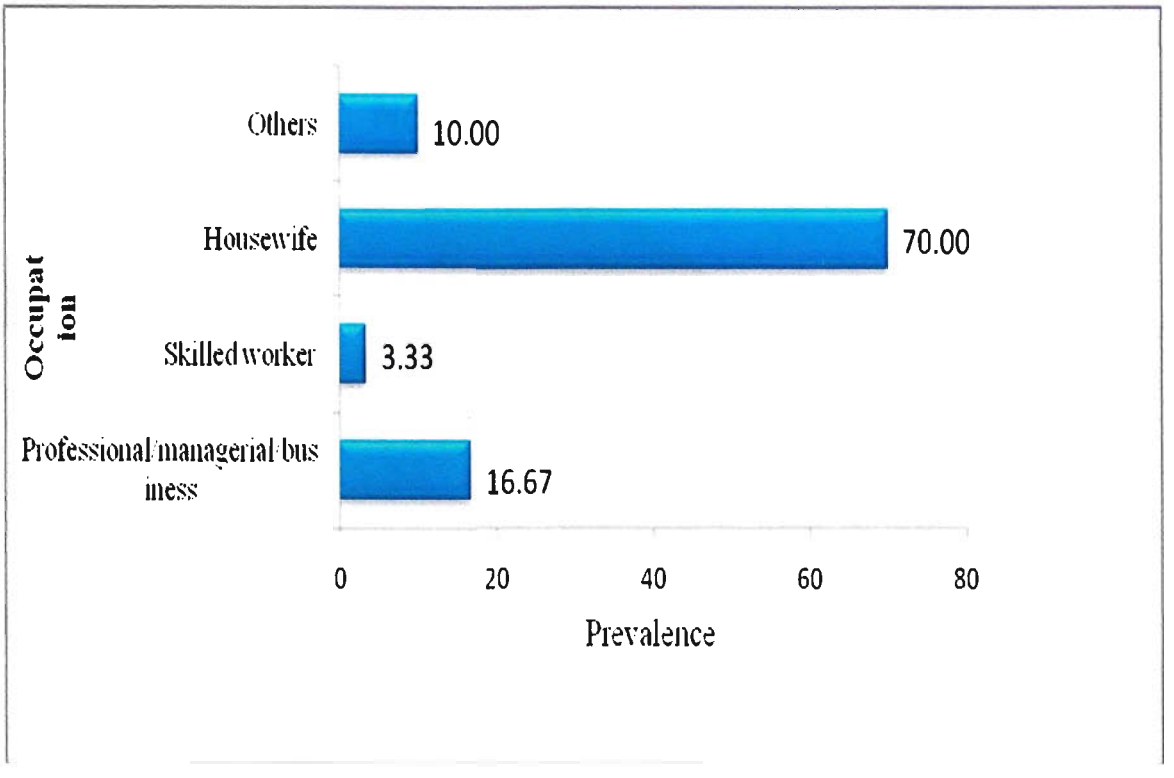

Figure 3.7 – occupation of Breast Cancer patients

From the Table 3.7 & Figure 3.7, it was observed that house wives were mainly (70%) by breast cancer (70%).

3.8 Smoking habit of patients:

Smoking habit of breast cancer affected patients were observed & presented in the following Table 3.8

Table 3.8 – Smoking habit of Breast Cancer patients

Smoking Habit	Non smoker	Ex-smoker > 6 Months
No. of Patients (N) = 30	26	4
Prevalence (%)	86.7	13.33

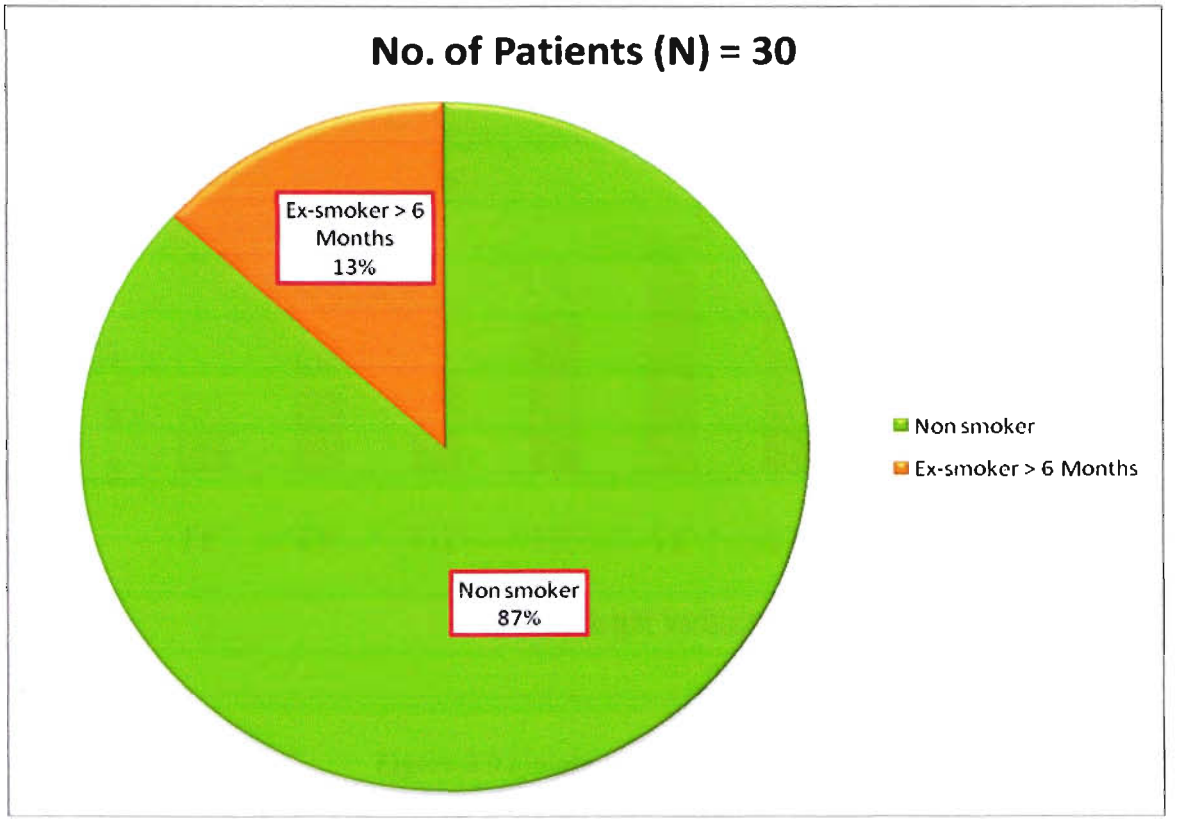

Figure 3.8 - Smoking habit of Breast Cancer patients

From the Table 3.8 & Figure 3.8, we can see that most of the patients are non smoker (86.67%) whereas a small percentage of patients are ex – smokers (13.33%).

3.9 Height of patients

Height distribution of the observed patients are shown in the table 3.9

Table 3.9 Height distribution of breast cancer affected patients

Height	4'8''	4'9"	4'11"	5'0"	5'1"	5'2"	5'3"	5'4"	5'6"
No. of Patients (N) = 30	1	2	1	4	5	9	2	5	1
Prevalence (%)	3.3	6.7	3.33	13	17	30.00	6.67	16.7	3.3

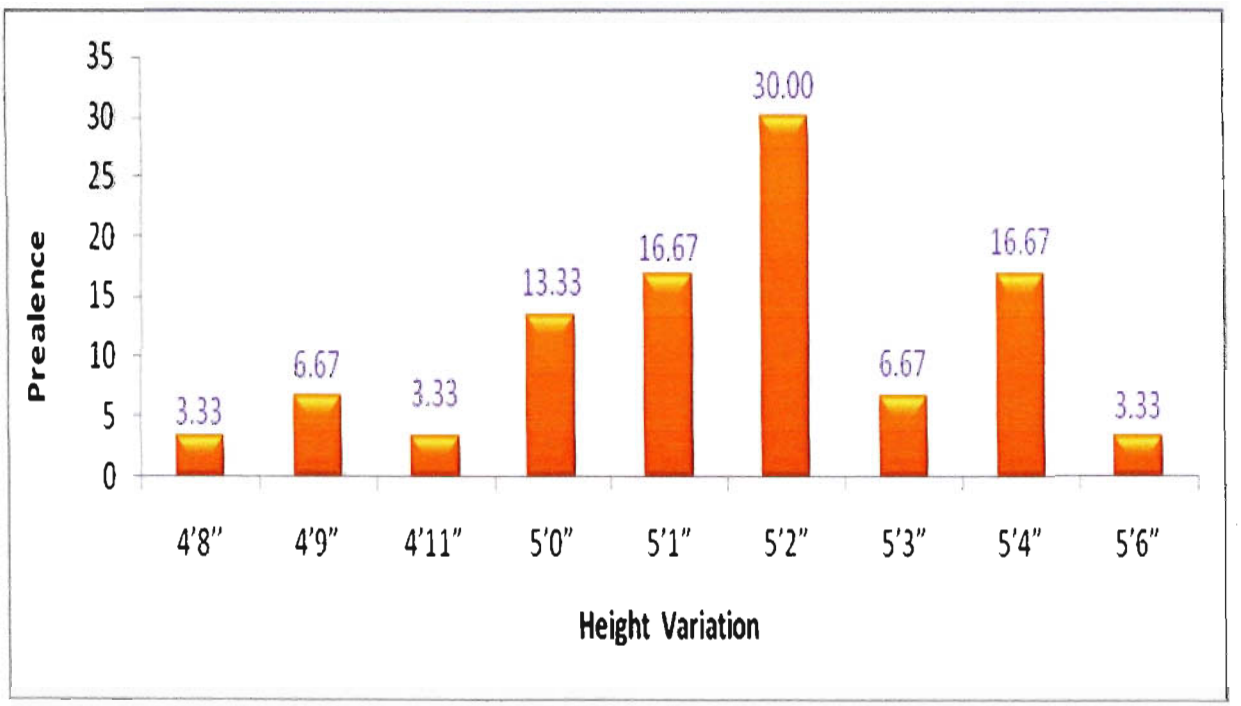

Figure 3.9 Height distributions of patients

From the above Table 3.9 & Graph 3.9, we can say that women having a height of about 5'2'' were at higher risk of breast cancer.

3.10 Weight distribution of patients

Weight distribution of the patients are observed & presented in the table 3.10 so that we can observe the risk factors of breast cancer.

Table 3.10 Weight distribution of patients

Weight distribution	41 – 50 kg	51 – 60 kg	61 – 70 kg	71 – 80 kg	81 – 90 kg
No. of Patients (N) = 30	9	11	4	5	1
Prevalence (%)	30.00	36.67	13.33	16.67	3.33

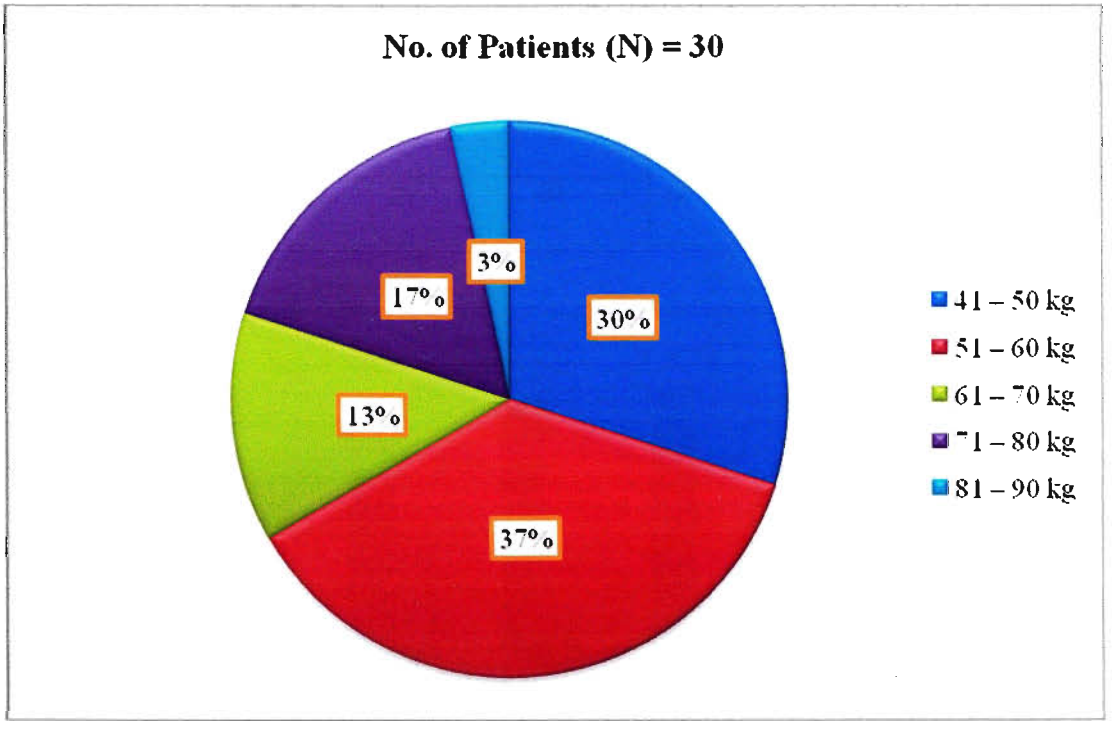

Figure 3.10 Weight distributions of patients

From the above Table 3.10 & Figure 3.10, we can say that the affected patients were in the weight range of 51 – 60 kg.

3.11 Biophysical Characteristics

Biophysical characteristics include pulse, blood pressure (BP), body temperature, hepatics & renal function of body. So the biophysical characteristics of the breast cancer affected patients were observed & tabulated & presented in graph below:

Table 3.11 Biophysical characteristics

Biophysical Characteristics		Pulse	BP	Body temperature	Hepatic function	Renal Function
Normal	No of patients (n = 30)	27	18	25	26	26
	Prevalence (%)	90	60	83.33	86.67	86.67
Abnormal	No of patients (n = 30)	3	12	5	4	4
	Prevalence (%)	10	40	16.67	13.33	13.33

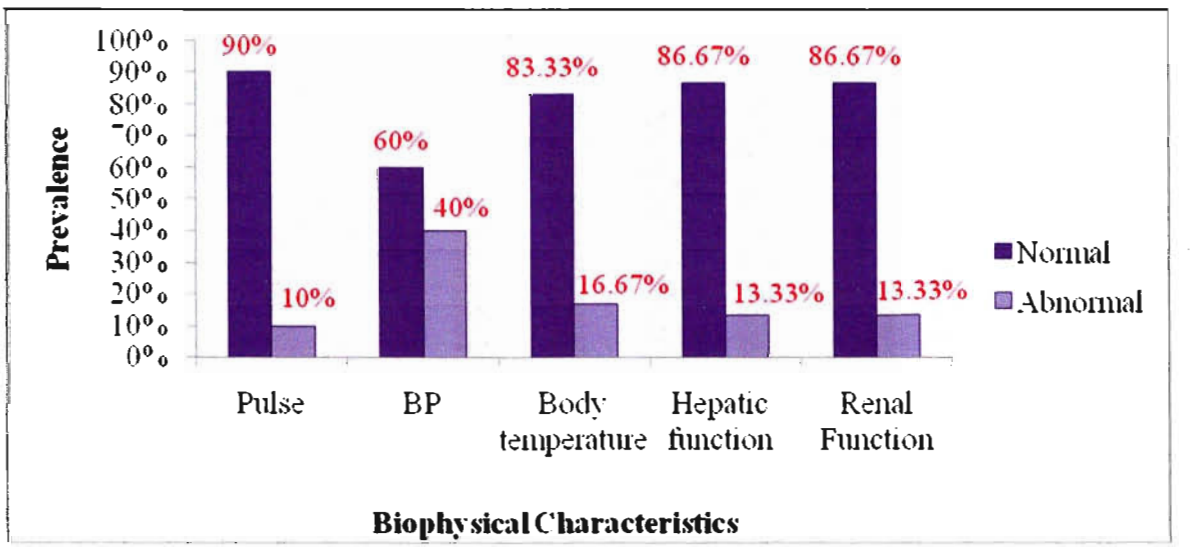

Figure 3.11 Biophysical characteristics of affected patients

From the above Table 3.11 & Figure 3.11, it was observed that almost all the patients had normal pulse, Bp, Body temperature, hepatic & renal functions.

3.12 Hematological Profile

Hematological profile; i.e. hemoglobin, ESR (Erithrocyte Sedimentation Rate), WBC (White Blood Cell), platelet, serum creatinine, serum urea, SGPT (SGPT (Serum Glutamic Pyruvic Transaminase) & bilirubin level of the patients were observed & tabulated & presented in graph below:

Table 3.12 Hematological Profile of affected patients

Hematological data		Hb	ESR	Platelet	WBC	S. Creatinine	S. Urea	SGPT	Bilirubin
Normal	No of patients (n = 30)	8	5	30	30	26	30	24	28
	Prevalence (%)	26.67%	16.67%	100%	100%	86.67%	100%	80%	93.33%
Abnormal	No of patients (n = 30)	22	25	0	0	4	0	6	2
	Prevalence (%)	73.33%	83.33%	0	0	13.33%	0	20%	6.67%

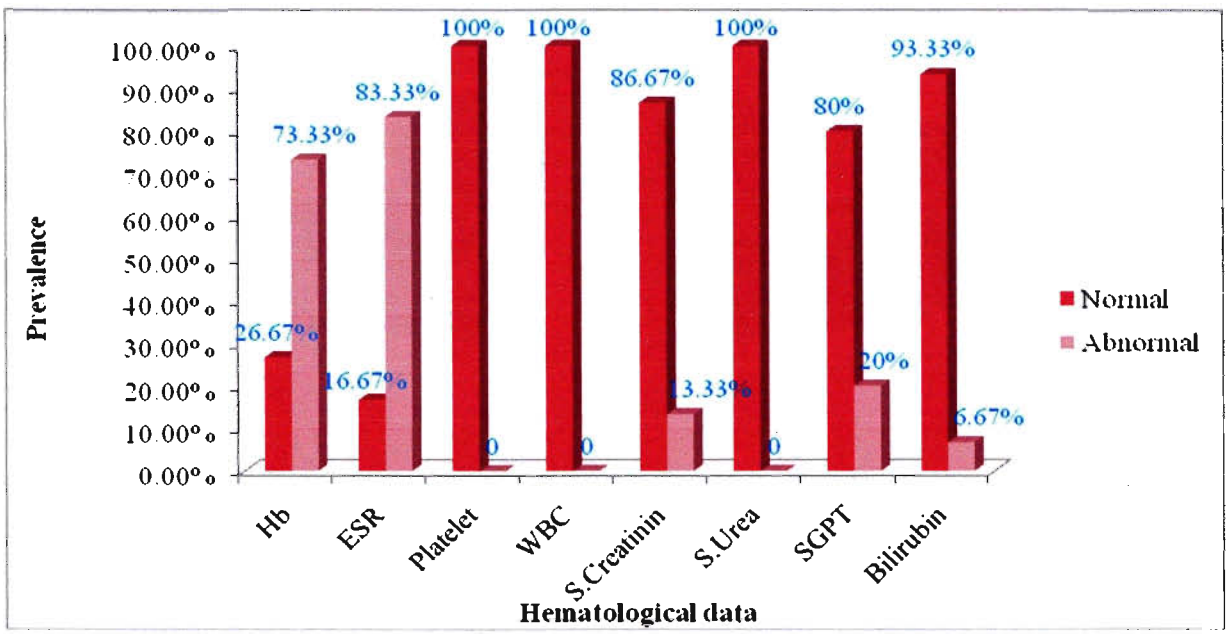

Figure 3.12 Hematological profiles of affected patients

From the above Table 3.12 & Figure 3.12, it was found that platelet, WBC & serum urea levels of the patients were fully normal whereas hemoglobin & ESR levels were totally abnormal.

3.13 Patient status

Hospital stays of the patients i.e. whether they are staying at hospital or not during their treatment period are observed & presented in table 3.13

Table 3.13 Patient status of breast cancer affected patients

Patient status	Out patient	In patient
No. of Patients (N) = 30	15	15
Prevalence (%)	50.00	50.00

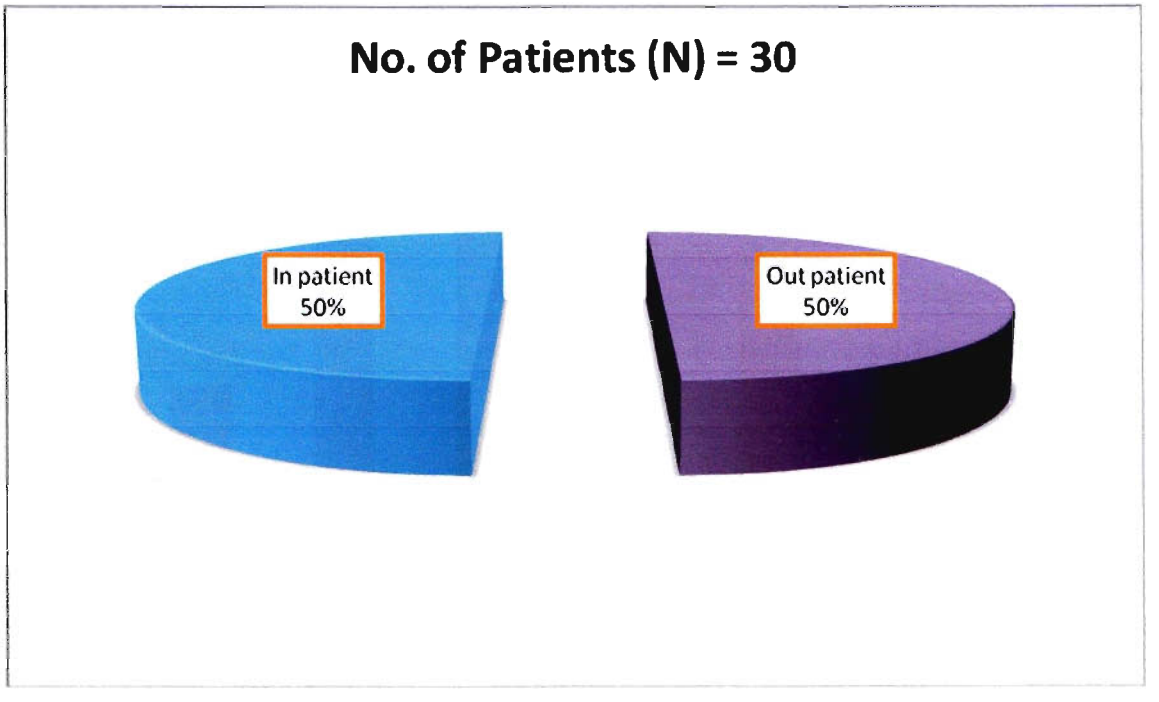

Figure 3.13 Patient status of breast cancer affected patients

From the above Table 3.13 & Figure 3.13, we can say that in both cases (in & out patients) 50% were found.

3.14 Age distribution of patients

The prevalence of breast cancer in female according to age distribution was tabulated & a graph was drawn as follow:

Table 3.14 Age distribution of patients

Age distribution	11-20 years	21-30 years	31-40 years	41-50 years	51-60 years	61-70 years	Greater than 70
No. of Patients (N) = 30	2	8	6	8	4	1	1
Prevalence (%)	6.67	26.7	20.00	26.7	13	3	3.33

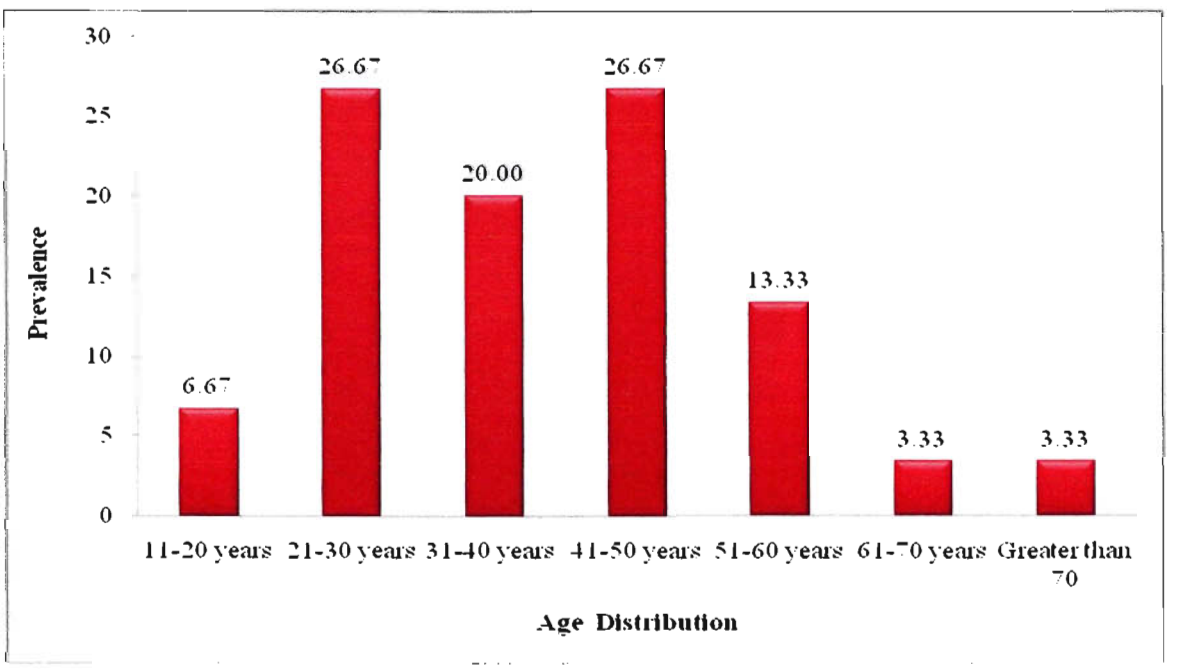

Figure 3.14 Age distribution of breast cancer affected patients

From the above Table 3.14 & Figure 3.14, we can say that female of age 21 – 30 years & 41 – 50 years were at higher risk of breast cancer (26.67%). The next prevalent group was 31 – 40 years. So we can say that female having ages ranging between 21 – 50 years remain in the high risk zone for breast cancer.

3.15 Staging of breast cancer

Staging is an important parameter in case of breast cancer diagnosis. So the staging of the breast cancer patient was observed & tabulated along with a graph in the following:

Table 3.15 Staging of breast cancer

Stage	Stage I	Stage II	Stage III	Stage IV
No. of Patients (N) = 30	3	20	6	1
Prevalence (%)	10.00	66.67	20.00	3.33

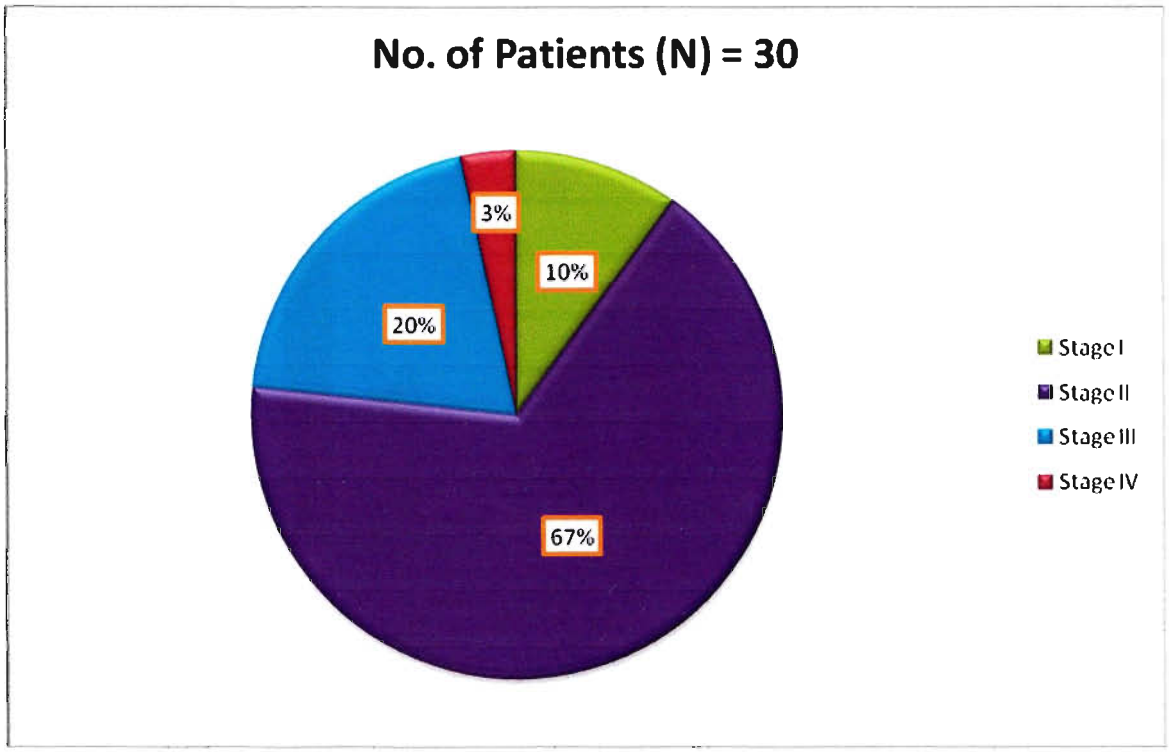

Figure 3.15 Staging of breast cancer

From the above Table 3.15 & Figure 3.15, we can say that stage II breast cancer is most prevalent (67%) in our country compared to the other stages. Another study conducted in Jordan by KHCC Experience in 2005-2006, supports our observed data where it was found that 41.32 % affected patients were mainly in Stage II. [49]

3.16 Risk factors of breast cancer

The risk factors of breast cancer are tabulated & presented in graph below:

Table 3.16 Risk factors of breast cancer

	No. of Patients (N) = 30	Prevalence (%)
Increasing age	6	20.00
Diet	24	80.00
Family history	12	40.00
Radiation	1	3.33
Obesity	11	36.67
Period at younger age	16	53.33
Menopause at older age	1	3.33
First child at older age	4	13.33
Alcohol	3	10.00
Did not breast feed child	10	33.33

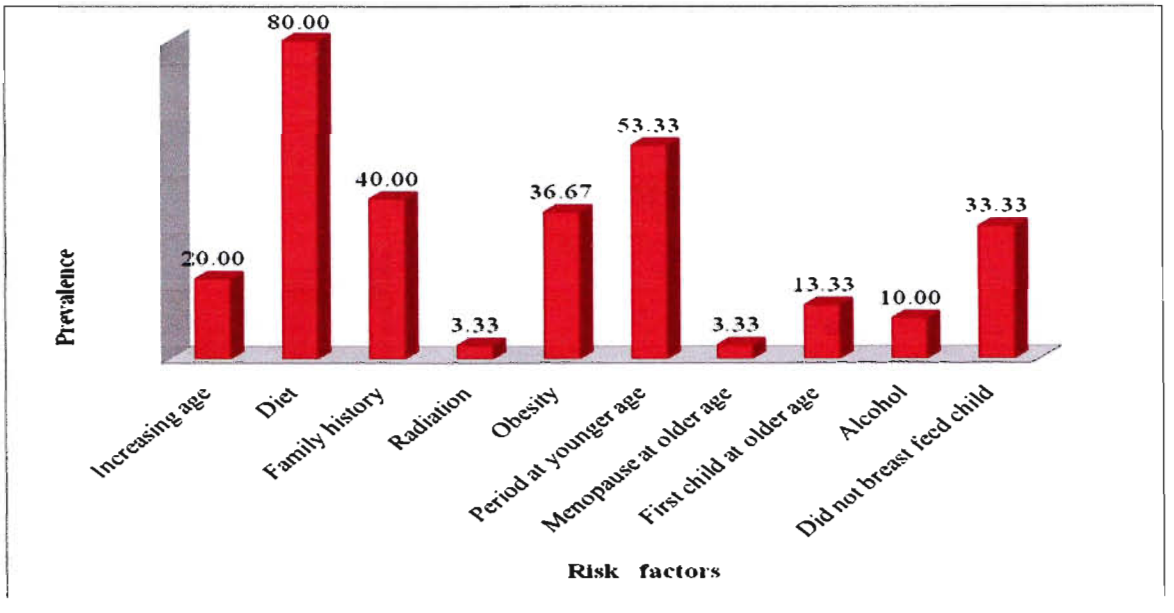

Figure 3.16 Risk factors of breast cancer

From the above Table 3.16 & Figure 3.16, we can say that female who take low fruit & vegetables in their diet were at high risk of breast cancer (80%). The next predominant

factors were beginning period at younger age i.e. age below 12 years was 53.33 % & female who didn't breast feed their child was 33.33%.

3.17 Sign & symptoms of breast cancer

The sign & symptom of breast cancer are observed & presented in the graph below:

Table 3.17 Sign & symptoms of breast cancer

Sign & symptoms	No. of Patients (N) = 30	Prevalence (%)
Lump	30	100.00
Bloody discharge	4	13.33
Any change in the size, contour, texture, or temperature of the breast	3	10.00
Redness or pitting, swelling and increased warmth in the affected breast	5	16.67

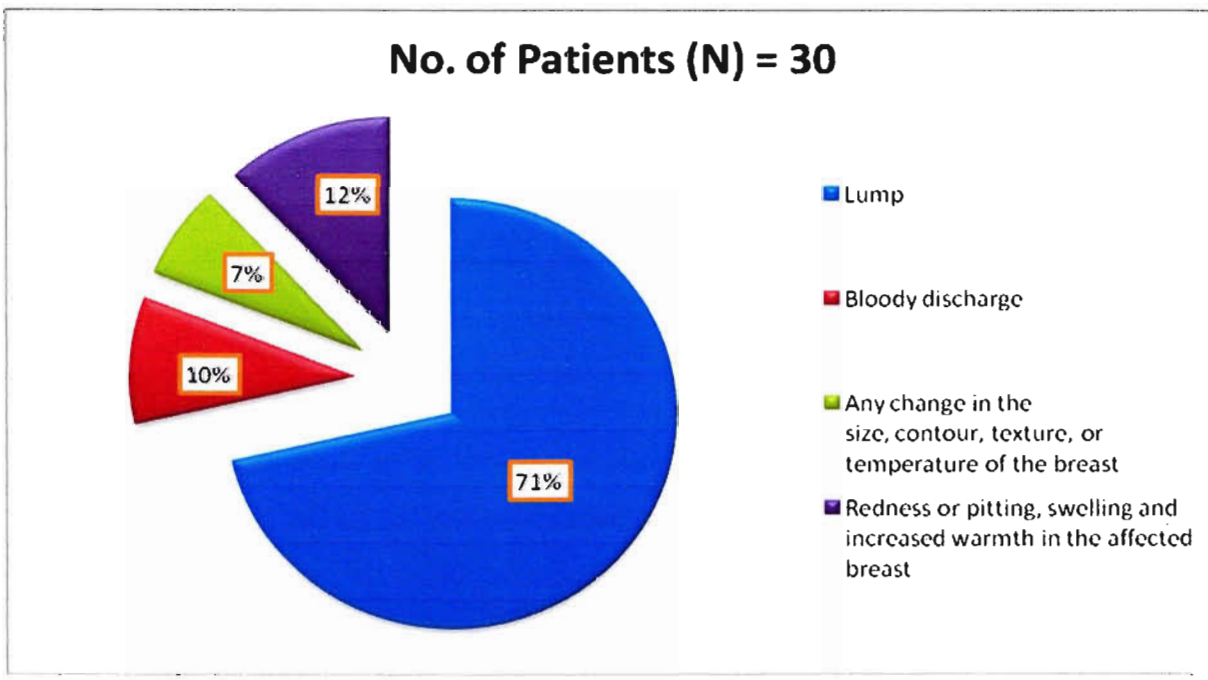

Figure 3.17 Sign & symptoms of breast cancer

From the Table 3.17 & Figure 3.17, we can say that lump in the breast or in the axillary region was the main sign of breast cancer (71%).

3.18 Diagnosis of breast cancer

Diagnosis options of breast cancer that are available & mostly used in our country are observed & tabulated below:

Table 3.18 Diagnostic procedures of breast cancer

Diagnosis	No. of Patients (N) = 30
BSE	19
X – Ray	24
Mammogram	15
Ultrasound	30
HER - 2	2
Biopsy	1
FNAC	21
Chest CT scan	1

From the above Table 3.18, it was obseved that ultrasound was the most common diagnostic technique for breast cancer patients (100%). The next procedures were Chest X – Ray (80%) & FNAC (70%).

3.19 Treatment pattern

Types of treatment are observed & tabulated & presented in the graph below:

Table 3.19 Types of treatment

Treatment	No. of Patients (N) = 30	Prevalence (%)
Lumpectomy	6	20.00
Mastectomy	25	83.33
Sentinel node biopsy	2	6.67
Axillary node dissection	2	6.67
Hormone therapy	2	6.67
Chemotherapy	1	3.33
Adjuvant chemotherapy	13	43.33
Radiotherapy	16	53.33

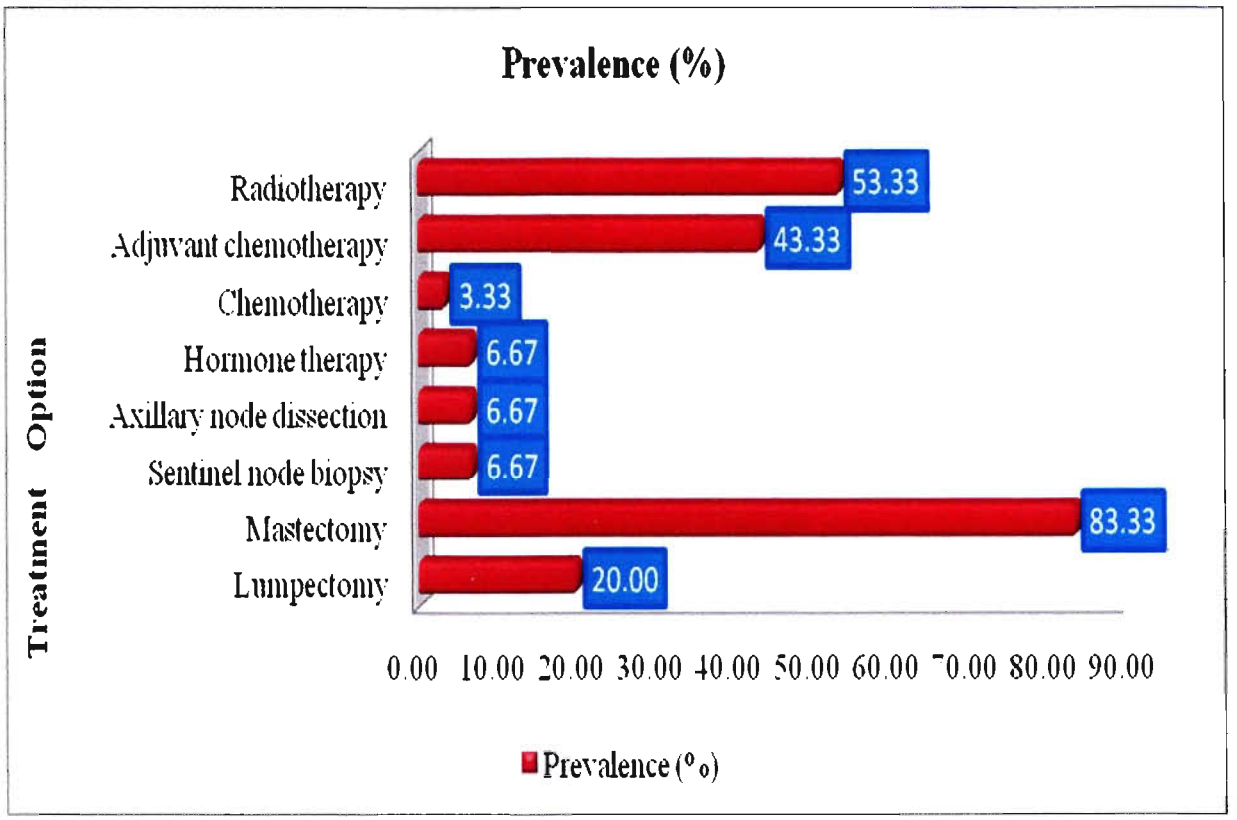

Figure 3.19 Types of treatment

From the above Table 3.19 & Figure 3.19, we can see that mastectomy (83%) was the most common type of treatment in our country. The next predominant treatment was radiotherapy (53%).

3.20 Disease Status

The disease status of the patients are observed & tabulated below:

Table 3.20 Disease status of patient

Disease status	Recurrent	Not recurrent
No. of Patients (N) = 30	6	24
Prevalence (%)	20	80

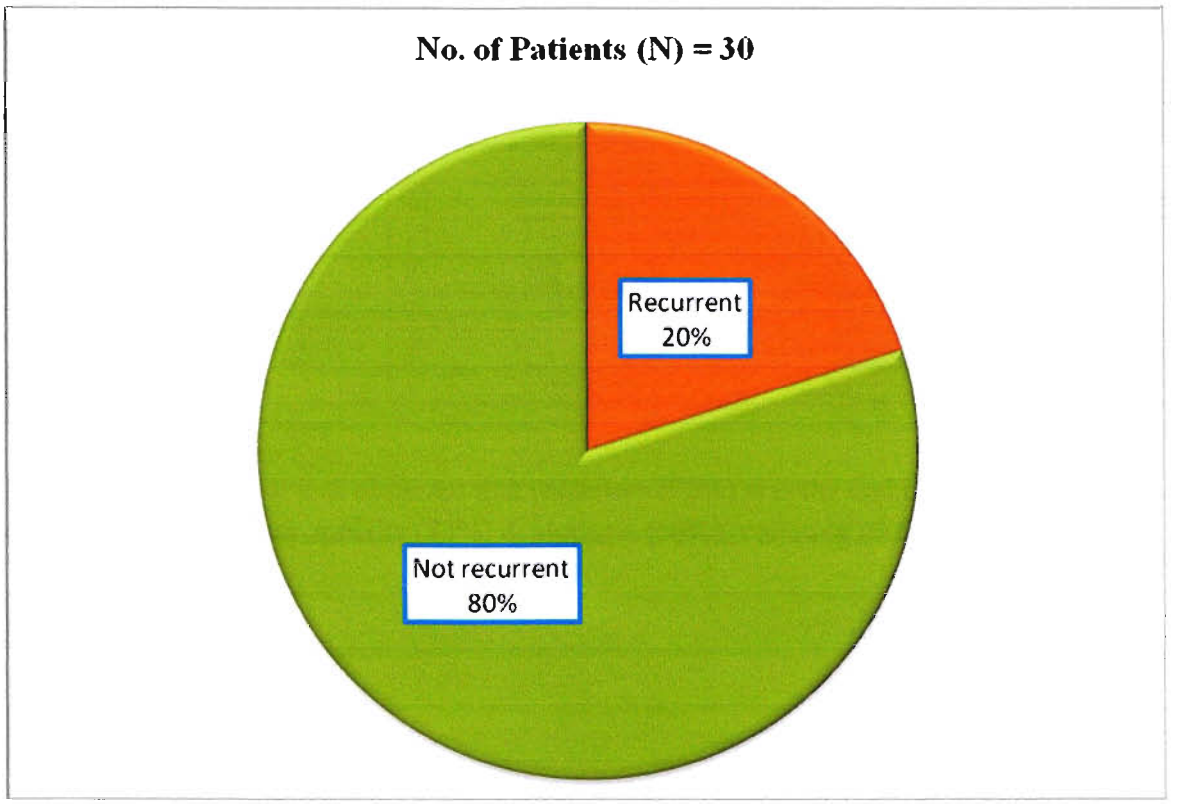

Figure 3.20 Disease statuses of patients

From the Table 3.20 & Figure 3.20, 20% patients had recurrent attack of breast cancer in the observed data's.

3.21 Side effects of the treatment

Side effects of the treatment are observed & tabulated as follows:

Table 3.21 Side effects of treatment

Side effects	No. of Patients (N) = 30	Prevalence (%)
Nausea	7	23.33
Vomiting	18	60.00
Alopecia	17	56.67
Changes in skin	3	10.00
Poor appetite	22	73.33
Premature menopause	8	26.67
Mouth & lip sore	2	6.67
Bloody stool	2	6.67
Chills	3	10.00
Weakness	27	90.00
Fever	11	36.67
Joint & muscle pain	2	6.67
Bleeding	2	6.67
Hot flashes	2	6.67
Decreased sex drive	1	3.33

From the Table 3.21 it was observed that weakness (90%) was the commonly occurring side effect followed by poor appetite (73%) & alopecia (60%), vomiting (60%).

3.22 List of medicaments that doctors prescribed

During & after the treatment of breast cancer, affected patients were prescribed some medications which are tabulated below:

Table 3.22 List of medicaments that doctors prescribe

Name of medicaments	Number of patients (n = 30)	Prevalence (%)
1. Antibiotic		
Cephalosporin	1	3.33
Cephradine	1	3.33
Ceftriaxone	8	26.67
Ciprofloxacin	3	10.00
Cefradoxil	1	3.33
Flucoxacillin	1	3.33
2. Analgesic & Antipyretic Drugs		
Paracetamol	5	16.67
Paracetamol + Caffeine	4	13.33
Diclofenac	3	10.00
Aceclofenac	2	6.67
Ketorolac	11	36.67
Voltarine	5	16.67
3. Anti – Ulcerant Drugs		
Omeprazole	4	13.33
Esomeprazole	4	13.33
Pantoprazole	20	66.67
Ranitidin	2	6.67
4. Sedative & Hypnotic Drugs		
Diazepam	3	10.00
Midazolam	3	10.00
Bromazepam	8	26.67
Triazolam	3	10.00
Alprazolam	2	6.67
Clonazepam	10	33.33
Zopidem	1	3.33

5. Antihistamines		
Fexofenadine	3	10.00
Cetrizine	4	13.33
Desloratidine	8	26.67
6. Vitamin, Mineral & nutritional Drugs		
Vitamin B complex	3	10.00
Iron supplements	2	6.67
Multivitamin preparations	25	83.33
7. Chemotherapeutic agents		
5 – Flurouracil (FU) + Cyclophosphamide + Methotrexate	7	23.33
5FU + epirubicin + cyclophosphamide + Docetaxel	2	6.67
Cyclophosphamide + Doxurubicine	4	13.33
Cyclophosphamide + Doxurubicine + Docetaxel	2	6.67
5. Anti – emetic Drugs		
Domperidon	15	50
Promethazine	3	10.00
6. Water & Electrolyte Replacement		
Sodium chloride	2	6.67
Potassium chloride	1	3.33
7. Blood Transfusion	3	10.00

Chapter 04: Discussion & Conclusion

4. Discussion & Conclusion

In our study out of the 30 patients we observed that all of them were female (100%). From this it was concluded that female patients were mostly affected by breast cancer rather than male during our study period in Bangladesh; though male breast cancer patients are significantly found in America & UK. [50]

We compared the prevalence of breast cancer in the four study center; i.e. Delta Medical College & Hospital (DMCH), Ahsania Mission Cancer Hospital (AMCH), Bangabandhu Sheikh Mujib Medical University (BSMMU) & National Institute of Cancer Research & Hospital (NICRH) & we observed that out of 30 patients 12 were from NICRH, 8 from BSMMU, 6 from AMCH & only 7 patients were from DMCH. So it was found that breast cancer patients were prevalent in National Institute of Cancer Research & hospital.

We observed the marital status of the patients & found that out of 30 patients 27 were married & 3 were unmarried. So we can say that married female were prevalent to breast cancer in our country.

Next in our observation about the place of living & education level of the patients we found that out of 30 patients 20 were from urban places & most of them were more or less educated except 3 illiterate female patients.

In our study we included the occupation & social class of the patients from where we got to know that about 21 out of 30 women were housewife & about 14 were from lower middle class which were mostly prevalent. But it does not signify that housewives are more prone to breast cancer. We worked with randomly collected data where we got housewives in higher prevalence.

We also observed the smoking habit of the patients where we found that 26 among 30 patients were non smoker whether only 4 were ex – smoker; i.e. they left smoking six months back.

After that we checked for the risk factors i.e. the major causes of breast cancer in the affected patients. Here we got to know that taking low fruit & vegetables; i.e. diet (80%) was the prevalent cause of breast cancer. The other leading causes were period at an early age (53.33%); i.e. at age below 12 years, family history of any cancer (40%) as we know that if a woman's mother or sister is suffering from breast cancer then she lies in the high risk zone of breast cancer, obesity (36.67%) & not breast feeding their babies (33.33%).

Sign & symptoms of breast cancer which is another major aspect of our project were observed & we found that all the patients (100%) had lumps when they were diagnosed. Some felt bloody discharge from the nipple (13.33%) & redness or swelling in the affected breast (16.67%) along with the lump which were significantly low in percentage.

We also observed the age distribution of the patients to check out the prevalence rate & found that women of ages ranging between 21 – 60 years lie in the high risk zone of breast cancer.

Diagnostic procedures of breast cancer in our country were seen. Staging is an important sub – division of the diagnostic process to know about the status of disease & we got that stage II breast cancer is prevalent in our country which was about 66.67%. Among tests done was checked which we found that ultrasound (100%) is the most commonly done to identify the symptom properly. The next important procedures were chest X – ray (80%) & FNAC (70%).

Patient status of the patients were also studied & observed that in both cases (in & out) 50% patients were observed.

Then we observed the biophysical status of the breast cancer affected patients. From this study we found that the heights of the patients were ranging from 5'0'' to 5'4'' & weight from 41 – 80 kg but 51 – 60 kg was the prevalent weight of the observed patients. The other factors were pulse rate, blood pressure (BP) & body temperature of the patients & we found that out of 27 patients had normal pulse rate, 16 had a normal blood pressure & 25 patients had the normal body temperature.

We also observed the hematological data's of the patients where we found that hemoglobin level of the patients were mostly lower than the normal range because of their economical condition & poor diet habit. For this reason some patients needed blood transfusion during their treatment period or in a continuous basis till now. ESR is a characterized test to observe the liver function test & to determine the rate of presence of infection in our body & it was seen that about 83.33% affected patients had an abnormal; i.e. increased level of ESR. The WBC, platelet, serum urea, serum creatinin, SGPT & bilirubin level of the patients were significantly in normal range except some abnormalities.

From the above hematological data we checked whether the liver & hepatic are normal or abnormal where we observed that in both cases about 86.67% affected patients had a normal liver & hepatic function.

Treatment options for breast cancer in Bangladesh was also studied & found that mastectomy i.e. the complete removal of the entire breast was the major treatment procedure (83.33%) along with adjuvant chemotherapy & radiation therapy. Other than this lumpectomy was also done in 20% patients.

One of the most important parameter of our project was to check whether the disease was recurrent or not to find out the further complications if the disease was recurrent. But in our observation we found out only 4 patients who were affected by recurrent breast cancer & their condition was vulnerable to describe.

Finally we observed the side effects that occurred during or after the treatment was running. We found that weakness was the major side effect about 90% in both operative & radiation taking patients. Then we also got poor appetite (73.33%), vomiting (60%), premature menopause (26.67%) & alopecia (56.67%) during the treatment period due to the highly toxic chemotherapy & radiation therapy.

So from the above discussion we can conclude saying that breast cancer is becoming a prevalent cancer in our country in female as no male patients are identified till now. At first people were conscious just about lung, brain & liver cancer but it is the high time now to be

concern about the breast cancer; as most of our people live below the poverty line & illiterate. Women from remote & rural areas & sometimes from urban areas are shy & do not share any of their physical changes or problems with their family or physician which leads further complication in a disease. It is only possible when government & non government organizations will work together along with all the people of our country to come out of social & religious hindrance to raise social awareness to fight against this vulnerable disease.

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