**Title: Study of Breast Cancer**

**1st DIKSHA GABHANE**

Assistant professor at Dept. IT, YCCE College, Hingna, Nagpur, India

E-mail:[dikshagabhane29@gmail.com](mailto:dikshagabhane29@gmail.com)

**2nd SAKSHI GABHANE**

Assistant professor at Dept. CT, YCCE College, Hingna, Nagpur, India

E-mail:[sakshigabhane@gmail.com](mailto:sakshigabhane@gmail.com)

**ABSTRACT**

*Cancer is a vital disease which can affect the overall health over a long period. Detecting cancer in earlier stage is still a challenging task for doctors. Detecting earlier can help to stop it further spreading and can be cured somehow. If it do not detected earlier then it can spread to other parts of body or to all over body leading to death also.*

*The proposed paper gives the study of breast cancer which includes stages of breast cancer, types and symptoms of it and risk factors of breast cancer.*

**INTRODUCTION**

Cancer is a disease of a body where the abnormal cells divide itself in uncontrolled growth; by spreading the abnormal cells it destroy body tissue which affects the regular functioning of body. And if not cured may lead to death.

Human body is multicellular body having multiple types of cell inside it. Cancer can develop almost any part of the body where cells are present. When the healthy cells perform its function cells divide to form new cells and unhealthy cells dies. This is the regular process but when uncontrolled division occurs then those extra formed cells causes cancer. Almost every cancer forms solid lumps (tumor) which are nothing but masses of tissues. But generally cancers like leukaemia do not form solid tumors.

Cancer can be called as a genetic disease causes because of changes in genes. Genes generally controls the cell functioning which include cell growth and division [10].

There are more than 100 types of cancers. Any type of cancer can be named as the organs or tissue where the tumor has been formed. Example, breast cancer begins in the cells of breast whereas lung cancer begins in the cells of lungs.

The most common type of cancers include,

* Bladder cancer
* Breast cancer
* Colon and Rectal cancer
* Endometrial cancer
* Kidney cancer
* Leukaemia (cancer of blood)
* Thyroid cancer
* Prostate cancer
* Pancreatic cancer
* Melanoma
* Lung cancer
* Liver cancer etc.

As breast cancer is spreading very vast in modern lifestyle some uncontrolled factors which causes or initiates cancer like Skin colour, menstrual history, radiation are the factors which cannot be controlled and can causes breast cancer. But some of the factors like weight, diet, alcohol consumption, and exercising can reduce the risk of cancer or these are the factors which can be controlled so as to lower the risk of cancer. No one can tell or predicts that one will develop breast cancer at which age, or in which condition but if taken prevention those conditions can be delayed or lessen [9].

Breast cancer can develop when breast cells started to grow abnormally. Breast cells divide more rapidly than healthy cells do. And because of this excess growth excessive breast cells forms a lump or a mass. Those excessive cells can spread all over your breast [9][10].

The tumors formed can be of benign or malignant. The formation of lump because of excessive cell division must not always malignant. It may be benign that do not spread outside of breast and cannot be life threatening. But if not cured or treated early can lead to develop breast cancer further

**Cells**

Cells grow, divide and replace each other in the normal healthy body. The old cells die automatically as the new ones form. Massive amount of unused body cells collected by uncontrolled division can form tumours [2][9]. That may be cancerous or not. In cells there are some genes that control the process of extra cell division. Generally there should be balance between the cell division and suppression. If any imbalance occurs in between them then the uncontrolled growth of cell occurs and hence form tumours and can lead to cancer. These cells can spread to other parts of body also. Or sometimes it do not spread, it stays at their original place only. It is not always mandatory to see rapid cell growth, sometimes the rate stays slower. When the older cells don’t die when it should be and new cells form unaccountably then this imbalance can affect the functioning and form a tumor[4]. These excessive cells or the tumor uses the nutrients and energy and hence lack of energy and nutrients would be faced by the cells around it.

It is not always mandatory to form a tumor in cancer, sometimes tumor cannot be formed such as leukaemia. . Most commonly breast cancer can be lobular carcinoma or Ductal carcinoma [1][5][10].

Treatment of cancer can depend on many factors such as size of tumor, type of tumor, stage of cancer, rate of growth, area of origin etc. Some tumors can be small but increases rapidly on the other hand some tumor can be large but grow slowly. Treatment of breast cancer is completely based on the biology and behaviour of breast cancer.

**LITERATURE SURVEY**

According to cell types Cancer can be mainly categorised into following:

1. Carcinomas which begin in the skin or tissues present in the internal organs.
2. Sarcomas which develops in the bone, muscles, cartilage, fat or any other connective tissues.
3. Lymphomas which begins in the immune system.
4. Leukaemia which starts in the blood and bone marrow.
5. Central nervous system cancers which develops in the brain and the spinal cord.

Generally tumor of cancer is divided into two main types:

**BENIGN TUMOR**

Benign tumor is mass of cells that serve no purpose. Benign tumor cannot spread from its initial place to other parts of body. It stays at its original place and can be less harmful. Some benign tumors need not to be treat if they do not cause any problem. Most of the benign tumor can be removed by surgery and once removed cannot grow back generally[11].

Generally benign tumors don’t show major symptoms. Mostly it is asymptomatic or shows some specific symptoms, depending on their tissue types and location[8]. As it doesn’t show major identifying symptoms it can’t be identified easily unless the tumor appears directly on the outer body.

Benign tumors are not death threatening.

**MALIGNANT TUMOR**

Malignant tumor spread to distant tissues and further other parts of body. As it spread to other parts malignant tumors are highly harmful. The rate of spreading can be slow or fast depending on the location and tissue types. Initially the malignant tumors may not show distinct symptoms but after spread it gives various symptoms through which it can be detected.

The malignant tumors needs treatment as early as possible or condition may severe [6]. And once the rate of spread becomes fast then the cure is difficult. If the tumors removed by surgery then it can grow back also.

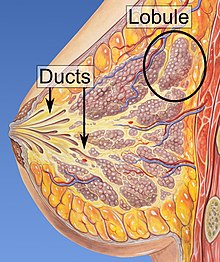
Malignant tumor can lay down to death also.

**BREAST CANCER**

Breast cancer can form in the cells of the breasts. It is the most common type of cancer among all females [1]. According to research breast cancer comes second after lung cancer. Though male can also have breast cancer as they also have breast tissues but the chance of breast cancer in male is 1% which is quit negligible. Breast cancer occurs because of the uncontrolled growth of cells in milk production gland or can also form in the milk carrying ducts to nipples [1] [7]. The old cells get damaged, die, and new ones form. Generally the new cells form whenever it has been required in the breast. If the new cell growth occurs even when not required or the older cells do not die regularly then excess cell can result in a lump or a tumor.

When the older cells don’t die when it should be and new cells form unaccountably then this imbalance can affect the functioning and form a tumor. These excessive cells or the tumor uses the nutrients and energy and hence lack of energy and nutrients would be faced by the cells around it.

The tumor formed in breast cancer is mostly malignant and if it is benign in initial stage then it can develop malignant after some time. The rate of formation can be slower sometimes[3].



Source: Wikipedia

A female breast consists of fat, connective tissues and lobules. Lobules are the small glands that produce milk at the time of breastfeeding. There are ducts which carry the milk from these lobules towards the nipple. Initially breast cancer appears in the inner lining of milk ducts or in the lobules. After that it spread to other parts of the body. Breast cancer can be spread from lymph to duct and to other parts of the body[11].

Breast cancer is caused by the genetic factors and the environment.

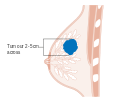
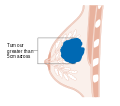
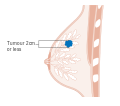
Most common types of breast Cancer include:

1. **Lobular carcinoma**: lobular carcinoma starts in the lobules. Lobules are the tiny glands that produce milk at the time of milk feeding. [6]
2. **Ductal carcinoma**: ductal carcinoma is the most common in all and it appears in the milk duct. [6]

**STAGES OF BREAST CANCER**

Breast cancer stages can be count in 0-4.

1. Stage 0: Stage 0 of breast cancer is known as ductal carcinoma in situ (DCIS), in which the affected cell presents only in the ducts and do not spread to surrounding tissues yet.
2. Stage 1: tumor in this stage measures up to 2cm across. No lymph node has been affected in this stage or only small group of cancer cells in the lymph node.
3. Stage 2: Unlike stage 1, the tumor around 2 cm starts to spread to nearby nodes, or is 2-5 cm across and like stage 1 it has not spread to lymph nodes.
4. Stage 3: in stage 3 the tumor becomes up to 5cm and spread to many lymph nodes or tumor becomes lager than 5cm and spread to few lymph nodes.
5. Stage 4: the cancer is spread to distant organs, such as bones, liver, brain, and lungs [9].



Source: Wikipedia

**RISK FACTORS OF BREAST CANCER**

1. Being female

Females have large number of breast cells and tissues as compared to males. Hence in females the risk of getting breast cancer is much higher than males. Although male an also suffer with breast cancer but the rate is quit negligible.

1. Increasing age

As the days pass and female becomes older, the chance of having breast cancer is increases with increasing age.

1. Genetics

The breast cancer could be hereditary. The issues from earlier genes of parents can further lead to the risk of breast cancer.

1. Personal history of breast condition

If previously breast issues like lumps, cysts had been occurred earlier than it can lead further to breast cancer.

1. Personal history of breast cancer

If breast cancer had been occurred previously and treatment is on-going or to be done for one breast then formation of breast cancer can possible for other breast or same breast again also.

1. Family history of breast cancer

If in family the first degree relatives are diagnosed with breast cancer than the risk is higher.

1. Radiation exposure

Radiation therapy for other cancer treatment or any other reason near chest area during childhood or adulthood can lead to breast cancer.

1. Obesity or body weights

Uncontrolled weight can be a factor to develop breast cancer.

1. Dense breast tissue

If the breast tissues are much denser then it can be a major issue to develop breast cancer. Dense breast tissues mean more number of breast tissues, and so the risk of forming mass in them is also large.

1. Alcohol consumption

Unlimited or excessive amount of alcohol consumption is directly connected to the breast cancer conditions.

1. Hormonal treatment

Any hormonal treatment which is directly or indirectly related to progesterone and estrogen can affect breast condition.

1. Menstrual period

If the menstruation started earlier than expected age or ends lately than expected then the number of menstrual cycle executed are more and its directly related to the hormones progesterone and estrogen.

1. Race and skin colour

The darken skin tone women have the less number of chances of forming breast cancer as compared to fair skin tone women.

1. Cosmetic implants and breast cancer survival

Cosmetics implants in the breast for the sake of attractive looks can also lead to breast cancer risk.

1. Physical activities and exercising

Physical activities and regular exercising can lower the risk of breast cancer [9][11].

**SYMPTOMS OF BREAST CANCER**

1. When sudden change in size, shape or appearance of a breast occur then irregularity of breast function may possible.
2. Change in the skin or colour of the skin around the breast.
3. Heavy pain in nipple area or any area of breast.
4. Rashes or swelling near breast area.
5. Formation of cyst or lump in the breast area or armpit.
6. Thickening of infected area in the breast.
7. Redness and Irritation of nipples.
8. Other than breast milk, discharge of fluid including blood.
9. Peeling, or scaling of the skin near breast or nipple.

Sometimes any sign or symptoms mentioned above can happen even it’s not cancer and can be because of some other reasons also. But still prevention is always better than cure and hence knowing the condition earlier could help to take proper care and to lower the risk. So by observing any of the symptoms one should do the diagnostic tests [9].

**DIFFERENT DIAGNOSTIC TEST**

After getting any sort of signs or symptoms various diagnostic test should be done to detect that it is cancer or not. If one gets to know that she is suffering from it, than treatment and preventions could be taken so as to decrease the ill effects. Early detection can help to cure the disease soon.

1. Mammogram:

The women above 45 ages should be recommending doing this annual mammogram regularly.

The mammogram is just like an x-ray which gives the picture of breasts. These pictures can identify problem in the breast such as masses, which may indicate cancer. The abnormalities shown in mammogram not always indicate breast cancer. There can be some other reasons also and therefor need further testing.

1. Ultrasound:

If a mammogram indicates or detects mass in your breast or if you notice any lump then it could be a breast cancer, so for further study doctors advise to do a breast ultrasound.

The breast ultrasound is the test which uses sound waves to produce images of inside view of your breast. The ultrasound can be used to detect whether a lump or mass is in fluid state or solid state.

1. Breast biopsy:

A sample of tissue from a mass or lump is gathered to detect whether it is cancerous or not. Depending on the size of tumor, several types of breast biopsy can be performed. It can be needle biopsy or surgical biopsy or etc.

Analysis of different biopsies can help to determine the grade of cancer, features of tumor and depending on this, particular type of treatment can be done.

1. Breast MRI scan:

A combination of magnet and radio waves are used to take pictures of inside view of breast.

Apart from these test, Bone scan, MRI scan, PET scan, CT scan tests are done once you confirmed of a breast cancer [3].

**REFERENCES**

1. Venur VA, Leone JP ‘‘[Targeted Therapies for Brain Metastases from Breast Cancer"](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5037817) International Journal of Molecular Sciences. September 2016.
2. Fornage BD, Hwang RF "Current status of imaging-guided percutaneous ablation of breast cancer" AJR: American Journal of Roentgenology. [PMID](https://en.wikipedia.org/wiki/PMID_(identifier)) [25055283](https://pubmed.ncbi.nlm.nih.gov/25055283) August 2014
3. Roubidoux MA, Yang W, Stafford RJ "Image-guided ablation in breast cancer treatment" Techniques in Vascular and Interventional Radiology. [PMID](https://en.wikipedia.org/wiki/PMID_(identifier)) [24636331](https://pubmed.ncbi.nlm.nih.gov/24636331) March 2014.
4. Sabel MS "Nonsurgical ablation of breast cancer: future options for small breast tumors"  Surgical Oncology Clinics of North America  [PMID](https://en.wikipedia.org/wiki/PMID_(identifier)) [24882353](https://pubmed.ncbi.nlm.nih.gov/24882353) July 2014
5. Ghoncheh M, Pournamdar Z, Salehiniya H ‘‘Incidence and mortality and epidemiology of breast cancer in the world. Asian Pac J Cancer Prev. 2016; 17(S3):43–6.
6. Li C, Anderson B, Daling J, Moe R ‘‘Trends in incidence rates of invasive lobular and ductal breast carcinoma. J Am Med Assoc. 2003; 289:1421–4.
7. Rakha EA, Ellis IO ‘‘Lobular breast carcinoma and its variants’’ Semin Diagn Pathol. 2010 ;27:49–61.
8. Arpino G, Bardou VJ, Clark GM, Elledge RM ‘‘Infiltrating lobular carcinoma of the breast: tumor characteristics and clinical outcome. Breast Cancer Res. 2004;6(3):R149–56.
9. Cancer-Its various types along with causes, symptoms, treatments and stages, in: cancer info guide. Mar2010. <http://www.cancer-info-guide.com/>
10. What is breast cancer? American cancer society.Mar2010. <http://www.cancer.org/docroot/CRI/content/CRI_2_4_1X_What_is_breast_cancer_5.asp>
11. Wikipedia and Different Websites