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BREAST CANCER – REVIEWS

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ABSTRACT

Breast cancer is the type of cancer that affects the breast. It is the most common invasive cancer in women. The incidence of breast cancer varies greatly around the world. It is lowest in less-developed countries and greatest in the more-developed countries. Types of breast cancers, Ductal carcinoma begins in the milk duct and is the most common type, labular carcinoma starts in the lobules, invasive breast cancer start when cancer cells break out from inside the lobules or duct and invade nearby tissue increasing to other parts of the body, while non-invasive is when the cancer is still inside its place of origin and has not broken out the first symptoms of the breast cancer are usually an area of thickened tissue in the breast or a lump in the breast or in an armpit.

The risk factors are, age, genetics, devise breast tissue eg Estrogen exposure and breast feeding, body weight, Alcohol consumption, Hormone treatment and radiation exposures. Diagnosis often occurs as a result of routine screening. Breast Examination, Imaging Tests, Biopsy, Radiation therapy, Sentinel node, Mastectomy and Lumpectomy. Treatment depends in types of breast cancer, stage of the cancer and sensitive of hormones: Eg Hormone blocking chemotherapy and surgery. Prevention based on avoiding excess alcohol, getting enough exercise, keeping healthy mess index and taking fresh fruits and vegetables. Good lifestyle is recommended E.g diet, exercise and weight loss recommend.

Keywords: Breast, cancer, Risk factors, diagnosis, treatment.

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INTRODUCTION

Cancer is the uncontrolled growth of abnormal cells anywhere in the body. The abnormal cells are termed cancer cells, malignant cells or tumor cells. These cells can infiltrate normal body tissues. The most common types of cancer include breast cancer, prostate cancer, lung cancer, colon cancer, melanoma etc. Breast cancer is the type of cancer that affects the breast. It is the most common invasive cancer in women, and the second main cause of cancer death in women, after lung cancer. Advances in screening and treatment have improved survival rates dramatically since 1989. The chance of any woman dying from breast cancer is around 1 in 37, or 2.7 percent (White *et al., 2009).*

In 2017, around 252,710 new diagnoses of breast cancer are expected in women, and around 40,610 women are likely to die from the disease. Awareness of the symptoms and the need for screening are important ways of reducing the risk.

All people, whether male or female, are born with some breast cells and tissue that have the possibility of developing into breast cancer. However, breast cancer in men is rare, with only about 2190 diagnoses each year (Ziel and Finkle 2003).

EPIDEMIOLOGY OF BREAST CANCER

Worldwide, breast cancer is the most common invasive cancer in women. It affects about 12% of women worldwide. (The most common form of cancer is non-invasive non-melanoma skin cancer; non-invasive cancers are generally easily cured, cause very few deaths, and are routinely excluded from cancer statistics.) Breast cancer comprises 22.9% of invasive cancers in women and 16% of all female cancers. In 2012, it comprised 25.2% of cancers diagnosed in women, making it the most common female cancer (McLaughlin *et al., 2015).*

In 2008, breast cancer caused 458,503 deaths worldwide (13.7% of cancer deaths in women and 6.0% of all cancer deaths for men and women together). Lung cancer, the second most common cause of cancer-related death in women, caused 12.8% of cancer deaths in women (18.2% of all cancer deaths for men and women together) (Rehm J etal 2007). The incidence of breast cancer varies greatly around the world: it is lowest in less-developed countries and greatest in the more-developed countries.

Breast cancer is strongly related to age with only 5% of all breast cancers occurring in women under 40 years old. There were more than 41,000 newly diagnosed cases of breast cancer registered in England in 2011, around 80% of these cases were in women age 50 or older. Based on U.S. statistics in 2015 there were 2.8 million women affected by breast cancer (Finn, 2005).

TYPES OF BREAST CANCER Breast cancer can be:

Ductal carcinoma: This begins in the milk duct and is the most common type.

Lobular carcinoma: This starts in the lobules. Invasive breast cancer is when the cancer cells break out from inside the lobules or ducts and invade nearby tissue, increasing the chance of spreading to other parts of the body. Non-invasive breast cancer is when the cancer is still inside its place of origin and has not broken out. However, these cells can eventually develop into invasive breast cancer. Breast cancer can also affect men, but it is less common in men than in women (Russo J. 1980).

SYMPTOMS OF BREAST CANCER: The first symptoms of breast cancer are usually an area of thickened tissue in the breast, or a lump in the breast or in an armpit (Yez, et al 2002). An early diagnosis of breast cancer increases the chance of recovery.

Other symptoms include:

- A pain in the armpits or breast that does not change with the monthly cycle

- Pitting or redness of the skin of the breast, like the skin of an orange
- A rash around or on one of the nipples
- A discharge from a nipple, possibly containing blood
- A sunken or inverted nipple
- A change in the size or shape of the breast
- Peeling, flaking, or scaling of the skin on the breast or nipple
- Most lumps are not cancerous, but women should have them checked by a health care professional. (Russo J. and Russo H. 1980).

STAGES OF BREAST CANCER: Cancer is staged according to the size of the tumor and whether it has spread to lymph nodes or other parts of the body. There are different ways of staging breast cancer. One way is from stage 0 to 4, but these may be broken down into smaller stages.

Stage 0: Known as ductal carcinoma in situ (DCIS), the cells are limited to within a duct and have not invaded surrounding tissues.

Stage 1: At the beginning of this stage, the tumor is up to 2 centimeters (cm) across and it has not affected any lymph nodes.

Stage 2: The tumor is 2 cm across and it has started to spread to nearby nodes.

Stage 3: The tumor is up to 5cm across and it may have spread to some lymph nodes.

Stage 4: The cancer has spread to distant organs, especially the bones, liver, brain, or lungs.

RISK FACTORS: The exact cause remains unclear, but some risk factors make it more likely. Some of these are preventable.

Age: The risk increases with age. At 20 years, the chance of developing breast cancer in the next decade is 0.6 percent. By the age of70 years, this figure goes up to 3.84 percent.

Genetics: If a close relative has or has had breast cancer the risk is higher. Women who carry the BRCAI and BRCA2 genes have a higher risk of developing breast cancer, ovarian cancer or both. These genes can be inherited. TP53 is another gene that is linked to a greater breast cancer risk.

A history of breast cancer or breast lumps: Women who have had breast cancer before are more likely to have it again, compared with those who have no history of the disease.

Having some types of benign, or non-cancerous breast lumps increases the chance of developing cancer later on. Examples include atypical ductal hyperplasia or lobular carcinoma in situ. (Aronowitz et al 2007).

Dense breast tissue Breast cancer is more likely to develop in higher density breast tissue.

Estrogen exposure and breast-feeding: Being exposed to estrogen for a longer period appears to increase the risk of breast cancer. This could be due to starting periods earlier or entering menopause later than average. Between these times, estrogen levels are higher. Breast-feeding, especially for over 1 year, appears to reduce the chance of developing breast cancer, possibly because pregnancy followed by breastfeeding reduces exposure to estrogen.

Body weight: Women who are overweight or have obesity after menopause may have a higher risk of developing breast cancer, possibly due to higher levels of estrogen. High sugar intake may also be a factor.

Alcohol consumption: A higher rate of regular alcohol consumption appears to play a role. Studies have shown_women who consume more than 3 drinks a day have a 1.5 times higher risk. (Allen N. et al 2009).

Radiation exposure: Undergoing radiation treatment for a cancer that is not breast cancer increases the risk of breast cancer later in life.

Hormone treatments: The use of hormone replacement therapy (HRT) and oral birth control pills have been linked to breast cancer, due to increased levels of estrogen.

Occupational hazards: In 2012, researchers concluded that exposure to certain carcinogens

and endocrine disruptors, for example in the workplace, could be linked to breast cancer.

In 2007, scientists suggested that working night shifts could increase the risk of breast cancer, but more recent research concludes this is unlikely._Cosmetic implants and breast cancer survival: Women with cosmetic breast implants who are diagnosed with breast cancer have a higher risk of dying from the disease and a 25 percent higher chance of being diagnosed at a later stage, compared with women without implants. _This could be due to due to the implants masking cancer during screening, or because the implants bring about changes in breast tissue. More research is needed. (Robb, C et al 2007).

CAUSES OF BREAST CANCER: After puberty, a woman's breast consists of fat, connective tissue, and thousands of lobules, tiny glands that produce milk for breast-feeding. Tiny tubes, or ducts, carry the milk toward the nipple. In cancer, the body's cells multiply uncontrollably. It is the excessive cell growth that causes cancer. Breast cancer usually starts in the inner lining of milk ducts or the lobules that supply them with milk. From there, it can spread to other parts of the body. (Rehm J et al 2007).

DIAGNOSIS: A diagnosis often occurs as the result of routine screening, or when a woman approaches her doctor after detecting symptoms.

Some diagnostic tests and procedures help to confirm a diagnosis.

- **Breast exam:** The physician will check the patient's breasts for lumps and other symptoms. The patient will be asked to sit or stand with her arms in different positions, such as above her head and by her sides.
- **Imaging tests:** A mammogram is a type of x-ray commonly used for initial breast cancer screening. It produces images that can help detect any lumps or abnormalities. A suspicious result can be followed up by further diagnosis. However, mammography sometimes shows up a suspicious area that is not cancer. This can lead to unnecessary stress and sometimes interventions. An ultrasound scan can help differentiate between a solid mass or a fluid-filled cyst. An MRI scan involves injecting a dye into the patient, to find out how far the cancer has spread.
- **Biopsy:** A sample of tissue is surgically removed for laboratory analysis. This can show whether the cells are cancerous, and, if so, which type of cancer it is, including whether or not the cancer is hormone-sensitive.

Lumpectomy: Removing the tumor and a small margin of healthy tissue around it can help prevent the spread of the cancer. This may be an option if the tumor is small and likely to be easy to separate from the surrounding tissue.

Mastectomy: Simple mastectomy involves removing the lobules, ducts, fatty tissue, nipple, areola, and some skin. Radical mastectomy removes muscle from the chest wall and the lymph nodes in the armpit as well.

Sentinel node biopsy: Removing one lymph node can stop the cancer spreading, because if breast cancer reaches a lymph node, it can spread further through the lymphatic system into other parts of the body.

Auxiliary lymph node dissection: If there are cancer cells on a node called the sentinel node, the surgeon may recommend removing several nymph nodes in the armpit to prevent the spread of disease.

Reconstruction: Following breast surgery, reconstruction can recreate the breast so that it looks similar to the other breast. This can be done at the same time as a mastectomy, or at a later date. The surgeon may use a breast implant, or tissue from another part of the patient's body.

Radiation therapy

Controlled doses of radiation are targeted at the tumor to destroy the cancer cells. Used from

around a month after surgery, along with chemotherapy, it can kill any remaining cancer cells. Each session lasts a few minutes, and the patient may need three to five sessions per week for 3 to 6 weeks, depending on the aim and the extent of the cancer. The type of breast cancer will dictate what type of radiation therapy, if any, is most suitable.

It may be the only option for patients who cannot undergo surgery, chemotherapy, or radiotherapy. The effects normally last for up to 5 years after surgery. The treatment will have no effect on cancers that are not sensitive to hormones. Examples include: Tamoxifen, Aromatase inhibitors, Ovarian ablation or suppression.

A luteinising hormone-releasing hormone agonist (LHRHa) drug called Goserelin, to suppress the ovaries.

Hormone treatment may affect a woman's future fertility.

Biological treatment: Targeted drugs destroy specific types of breast cancer. Examples include trastuzumab (Herceptin), lapatinib (Tykerb), and bevacizumab (A vastin). These drugs are all used for different purposes. (Robb L et al 2007).

Treatment will depend on: The type of breast cancer, The stage of the cancer, Sensitivity to hormones, The patient's age, overall health, and preferences.

The main options include: Radiation therapy, Surgery, Biological therapy, or targeted drug therapy, Hormone therapy, Chemotherapy. Factors affecting the choice will include the stage of the cancer, other medical conditions, and individual preference. If surgery is needed, the choice will depend on the diagnosis and the individual. Adverse effects include fatigue, lymphedema, darkening of the breast skin, and irritation of the breast skin.

Chemotherapy: Medications known as cytotoxic drugs may be used to kill cancer cells, if there is a high risk of recurrence or spread. This is called adjuvant chemotherapy. If the tumor is large, chemotherapy may be administered before surgery to shrink the tumor and make its removal easier. This is called neo-adjuvant chemotherapy. Chemotherapy can also treat cancer that has metastasized, or spread to other parts of the body, and it can reduce some symptoms, especially in the later stages. It may be used to reduce estrogen production, as estrogen can encourage the growth of some breast cancers. Adverse effects include nausea, vomiting, loss of appetite, fatigue, sore mouth, hair loss, and a slightly higher susceptibility to infections. Medications can help control many of these.

Hormone blocking therapy: Hormone blocking therapy is used to prevent recurrence in hormone-sensitive breast cancers. These are often referred to as estrogen receptor (ER) positive and progesterone receptor (PR) positive cancers. Hormone blocking therapy is normally used after surgery, but it may sometimes be used beforehand to shrink the tumor.

PREVENTION: There is no sure way to prevent breast cancer, but some lifestyle decisions can significantly reduce the risk of breast and other types of cancer.

These include:

- Avoiding excess alcohol consumption
- Following a healthy diet with plenty of fresh fruit and vegetables
- Getting enough exercise
- Maintaining a healthy body mass index (BMI)
- Women should think carefully about their options for breast-feeding and the use of HRT following menopause, as these can affect the risk.
- Preventive surgery is an option for women at high risk. (Xing P et al 2010).

CONCLUSION: There are two important aspects in breast cancer prevention: early detection and risk reduction. Screening may identify early noninvasive cancers and allow

treatment before they become invasive or identify invasive cancers at an early treatable stage. But screening does not, per se, prevent cancer. Breast cancer prevention really must be understood as risk reduction. In extremely high-risk patients, such as those who have BRCA mutations, risk reduction may involve prophylactic surgical removal of the breasts and ovaries. For the average patient, lifestyle modifications (diet, exercise, weight loss) may be easily recommended and have many' other benefits. For patients who have an increased risk based on other factors, the use of hormone-blocking agents, in addition to the usual lifestyle recommendations, may also be considered.

RECOMMENDATIONS

- The US Preventive Services Task Force (USPST) recommends biennial screening mammography for women aged 50 to 74 years. The decision to start screening mammography in women prior to age 50 years should be an individual one. Women who place a higher value on the potential benefit than the potential harms may choose to begin biennial screening between the ages of 40 and 49 years.
- For women who are at average risk for breast cancer, most of the benefits of mammography results from biennial screening during ages 50 to 74 years. Of all the age groups, women aged 60 to 69 years are most likely to avoid breast cancer death through mammography screening. While screening mammography in women aged 40 to 49 years may reduce the risk for breast cancer death, the number of deaths averted is smaller than that in older women and the number of false-positive results and unnecessary biopsies is larger. The balance of benefits and harms is likely to improve as women move from their early to late 40s.
- In addition to false-positive results and unnecessary biopsies, all women undergoing regular screening mammography are at risk for the diagnosis and treatment of noninvasive and invasive breast cancer that would otherwise not have become a threat to their health, or even apparent, during their lifetime (known as "over diagnosis"). Beginning mammography screening at a younger age and screening more frequently may increase the risk for over diagnosis and subsequent over treatment.
- Women with a parent, sibling, or child with breast cancer are at higher risk for breast cancer and thus may benefit more than average-risk women from beginning screening in their 40s.

The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening mammography in women aged 75 years or older.

The USPSTF concludes that the current evidence is insufficient to assess the benefits and harms of digital breast tomosynthesis (DBT) as a primary screening method for breast cancer.

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