

AN OVERVIEW ABOUT BREAST CANCER IN WOMEN

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ABSTRACT

The most frequent cancer in women and the second most common cancer overall among newly diagnosed cases is breast cancer. There is much evidence showing the influence of life style and environmental factors on the development of mammary gland cancer (high-fat diet, alcohol consumption, lack of physical exercise), the elimination of which may contribute to a decrease in morbidity and mortality. Secondary prevention aids in the early detection of tumours or abnormalities predisposing to tumours and includes diagnostic procedures (such as mammography, ultrasonography, magnetic resonance imaging, breast self-examination, as well as contemporary and more precise imaging techniques). Hormone replacement therapy (HRT) is also medical treatment that involved in breast cancer.

KEYWORDS: Breast cancer, Oestrogen, Progesterone, Menopause, lifestyle factors.

Overview

Breast cancer is the most common cancer among women in both developed and less-developed countries. The incidences of breast cancer are rising globally, with postmenopausal and oestrogen receptor-positive patients increasing in particular cases. In order to avoid cancer, the World Cancer Research Fund (WCRF) and American Cancer Society (ACS) suggest keeping a healthy weight, participating in limiting alcohol consumption, exercising in at least 150 minutes of moderate-intensity activity per week, and following a plant-based diet. Researchers have observed a decreased risk of pre- and postmenopausal breast cancer with lifelong following to physical activity and alcohol guidelines. Maintaining a healthy weight throughout life seems to prevent cases after menopause.

Although maintaining a nutritious diet does not specifically lower the risk of developing breast cancer, it is still essential because it lowers the risk of developing other chronic diseases like dementia, diabetes, and cardiovascular disease (CVD). Recent research indicates that smoking in adolescence or early adulthood increases the risk of breast cancer in the future. According to recent expert reports, successful lifestyle improvements could prevent 25% to 30% of breast new cancer cases.

INTRODUCTION

Breast cancer is one of the most important health problems global women's issues and morbidity and mortality are expected to increase significantly over the next 5 to 10 years.^[1-2] Some studies have reveals the main causes of breast cancer and specific molecules

related to breast cancer. Technologies have been developed to improve early detection of breast cancer. Today, therapy compounds, synthetic or natural, that can effectively inhibit or potentially controlling molecular targets are available to increase survival rates for breast cancer patients.^[3-6] However, the death toll is still high and so the researchers continue researching new treatments for breast cancer. It is now accepted that radiation therapy, chemotherapy, and surgery are used to treat breast cancer in women. In the hope of reducing side effects and increasing overall survival rates, ongoing research is making treatments more individualized.^[7]

Increasing cases of breast cancer in young women have caught the attention of researchers. Strong data indicates that breast cancer is more common in women under 45 years old without a doubt the main factor in cancer-related deaths. Furthermore, data to date indicate that a disproportionately large percentage of young women died from breast cancer, which is a considerable burden in developing countries compared to developed countries. Most articles refer to women who are 35, 40, or 45 years old when defining young women in breast oncology settings, but there are exceptions to this rule as a youngster.^[8] In this article, we deal with breast cancer in women and its treatment.

Causes

When DNA damage to cells occurs and is not repaired at the cellular level, cancer may develop. Precancerous mutations and malignant tumours are two different phases in the progression of cancer. Cancer begins in a

single cell. Many variables can influence the development of cancer, from genetics (such as the BRCA genes) and lifestyle factors (such as smoking, sun tanning, and diet) to environmental exposures to carcinogens.^[9]

Obesity, overweight, and breast cancer risk

Menopausal status and disease subtypes have different effects on how obesity affects breast cancer risk. According to recent research, a high BMI is highly correlated with an increased risk of breast cancer following menopause but is associated with a lower risk of breast cancer before menopause.

Sign and Symptoms

1. Colour changes of nipple
2. Retracted or inverted nipple
3. Breast or nipple pain
4. Lumps
5. Nipple discharge
6. Swelling
7. Redness or rash
8. Changes to skin texture
9. Lump around collar bone or underarm

Types of breast cancer

According to site, it is divided into invasive and non-invasive breast cancer

A. Non-invasive breast cancer

1. Lobular carcinoma in situ (LCIS)
2. Ductal carcinoma in situ

B. Invasive breast cancer

1. Infiltrating ductal carcinoma
2. Infiltrating lobular carcinoma (ILC)
3. Medullary carcinoma
4. Mucinous carcinoma
5. Tubular carcinoma
6. Inflammatory breast cancer

A. Non-invasive breast cancer

It is a carcinoma that has not spread beyond the ducts or lobules where it is located.^[10]

1. Lobular carcinoma in situ (LCIS)

This sort of breast cancers develops into breast lobules.^[11] The breast cancer has now no longer prolonged outside to the lobules into the breast tissue.^[12] Lobular carcinoma in situ is commonly identified as non-invasive breast cancer.^[13]

2. Ductal carcinoma in situ

It is the type of non-invasive breast cancer that affects the breast duct only and is the most common. Ductal comedocarcinoma is an example of ductal carcinoma in situ.^[14]

B. Invasive breast cancer

It occurs when abnormal cells from the milk ducts or lobules split out and get in close contact with breast

tissue.^[15] Cancer cells can spread from the breast to several body areas via the immune system or the circulatory system.^[16]

1. Infiltrating ductal carcinoma

A different name for invasive ductal carcinoma is invasive ductal carcinoma. IDC begins in the milk ducts of the breast and spreads to the duct wall before infiltrating the fatty tissues of the breast and likely other body areas.^[17]

2. Infiltrating lobular carcinoma (ILC)

A related term for invasive lobular cancer is invasive lobular carcinoma. The milk glands (lobules) in the breast where ILC begins, but it frequently spreads to other parts of the body.^[18]

3. Medullary carcinoma

A defined boundary of normal tissue and medullary tissue is designed by the invasive breast cancer known as medullary carcinoma.^[19]

4. Mucinous carcinoma

Mucinous carcinoma, also known as colloid carcinoma, is a rare form of breast cancer caused by cancer cells that produce mucus. In general, ladies with mucinous carcinoma typically have a favorable survival than females with other types of invasive carcinoma.^[20]

5. Tubular carcinoma

Women with tubular carcinoma typically have higher chances than women with other types of invasive cancer.^[21]

6. Inflammatory breast cancer

Breasts that are swollen, heated and red, with broad ridges and/or dimples are signs of inflammatory breast cancer because the cancer cells have blocked the lymphatic channels or veins in the skin above the breast. Strong inflammatory breast cancer is rare and growing really quickly.^[22]

Stages of breast cancer

Breast cancer reports indicate that the size, shape, and extent of the tumour, as well as how deeply the malignant cells have permeated the breast tissues, determines the stage of the disease.^[23]

Stage 0

The ductal cell carcinoma in situ tumour stage is an example of a non-invasive tumour stage in which both cancerous and non-cancerous cells are contained within the boundaries of the area of the breast where the tumour first appears and there is no evidence of their invasion of the tissues around that area (DCIS).^[24]

Stage 1

This stage of the disease is known as an invasive breast cancer, and microscopic invasion is still possible. It is divided into two stages: stage 1A and stage 1B. Category

1A refers to a tumour up to 2 cm in size with no lymph nodes included, whereas stage 1B refers to a small cluster of cancer cells larger than 0.2 mm observed in a lymph node.^[25]

Stage 2

There are also two categories in Stage 2: 2A and 2B. Stage 2A indicates a tumour that is identified in the sentinel or axillary lymph nodes but not in the breast. The tumour can range in size from less than 2 cm to more than 5 cm. Stage 2B, however, states that the tumour may exceed 5 cm in size but cannot reach the axillary lymph nodes.^[26]

Stage 3

It has been subdivided into the three subcategories 3A, 3B, and 3C. Stage 3A describes a tumour that is not found in the breast but may be found in 4 to 9 axillary lymph nodes or in sentinel lymph nodes, Stage 3B describes a tumour of any size that has caused swelling or an ulcer on the breast's skin and has spread up to 9 axillary lymph nodes or to sentinel lymph nodes Stage 3B breast cancer is known as inflammatory breast cancer and is characterised by red, heated, and swollen breast skin. Stage 3C, although, refers to the spread of the tumour to 10 or more axillary lymph nodes, as well as to the lymph nodes above and below the collarbone.^[27]

Stage 4

This stage of cancer is advanced and metastatic, and it indicates how the disease has progressed to several body organs, including the lungs, bones, liver, brain, and others.^[28]

Diagnosis

Self-Examination

The majority of doctors instruct women to perform monthly BSE (Breast Self-Examination) so that they may be recognised by their typical structure and authorised with regard to their own healthcare. Women are instructed on how to check for breast cancer by themselves. By self-examination, women can find irregularities in the size and shape of their breast.^[29-32]

Ultrasound breast imaging

If a tumour is solid or fluid-filled and needs to be biopsied to rule out cancer, ultrasound breast imaging reveals its size and location. That check is rapidly turning into a common procedure for identifying tumours in young women.^[33-34]

Oestrogen and progesterone receptors

Breast cancer cells are examined for oestrogen and progesterone receptors, as well as the HER2 antigen, in order to identify the disease. These tests provide details on the cancer's aggressiveness and the effectiveness of specific medications used to treat breast cancer.

MRI and Breast cancer

Mammography has been considered for years to be an effective screening method to detect breast cancer, but it cannot distinguish between solid and cystic masses and can miss up to 10-15% of cases. In comparison, MRI yields more accurate results and is clearly beneficial for women who are at an increased risk of breast cancer due to the BRCA1 and BRAC2 genetic mutation and have axillary lymph adenopathy.^[35-36]

Breast biopsy

The best method for detecting breast cancer is a breast biopsy. Breast biopsies come in a wide variety of different forms. Breast imaging, clinical breast examination, and biopsy are done together to increase diagnosis accuracy and eliminate as many false negative results as possible (triple test)

Fine needle aspiration

To remove cells from an aberrant region or a breast lump, a thin thorn is used.^[38]

The prickle can be managed with the aid of ultrasound. The area where the prickle will be introduced may be anaesthetized with a limited anaesthetic.^[39]

Core biopsy

To obtain some tissue (a core) from the abnormal area or breast lump, a larger prickle is used.^[40] For the duration of the core biopsy, MRI, ultrasound, and mammography can be utilised to guide the prickle.^[41]

Digital mammography

Finding tumours in dense tissue is helpful. Also, it is simple to store and send the image to a different radiologist for a second opinion.^[42-44] Although mammography is regarded as the gold standard test for the early diagnosis of breast cancer, in the event that there are insufficient resources in

For the purpose of early detection of breast cancer, some programmes for breast health awareness should be promoted, and staff members should also receive training in clinical breast examination so that patients can be diagnosed at an earlier stage, particularly in places where mammography is not available.^[45-46]

PEM and MRI in breast cancer patients

Thus, both positron emission mammography and magnetic resonance imaging have shown their ability to identify breast cancer; yet, the sensitivity of PEM and MRI is unaffected by hormone replacement treatment, postmenopausal status, or breast tissue density. Patients who don't want to have an MRI for a number of reasons, such as tight schedules, a lack of interest, or claustrophobia (fear of being kept in a small region), can use positron emission mammography as a replacement.^[47]

Treatment

The stage of the cancer, as well as its location, size, whether it has spread to other body organs, and the patient's physical health, all impact how the disease is managed. Targeted therapies, hormone therapy, radiation therapy, and surgery are now used in the treatment of breast cancer.

Surgery

This is the most efficient healthcare method for those whose breast cancer has not spread to other body parts and is also an option for people in more advanced, difficult stages of the illness.^[48-50] The quantity of tissue removed with the cancer depends on the kind of breast cancer surgery, how far the cancer has spread, and the patient's personal preferences.

Lumpectomy (Breast conserving surgery)

According to the American Cancer Society, a lumpectomy or partial mastectomy is a treatment where the majority of the breast is preserved as much as possible while removing the portion of the breast that has a malignant tumour along with some healthy tissues and surrounding lymph nodes.^[51] Most doctors and patients prefer lumpectomies over whole breast removals at first, especially when the patient is more worried about losing her breast. However, side effects of a lumpectomy include discomfort, acute inflammation, sclerosis, and altered breast appearance, among others.^[52-53]

Mastectomy

The purpose of a mastectomy is to lower the chance of developing breast cancer.^[54] A mastectomy is considered to be the most effective treatment for breast cancer that has already spread and for which a lumpectomy was insufficiently effective. Yet, the loss of a breast leads most women to feel asexual, lose their self-confidence, and fall into depression.^[55]

Reconstructive surgery

Women who undergo a mastectomy may also choose to undergo immediate or delayed breast reconstruction. It is done to improve the appearance of the breast after tumour surgery. All females having mastectomy procedures must be given the choice of reconstructive surgery.^[56]

Radiation therapy

It assists in decreasing the need for mastectomy surgery. In the early stages of breast cancer, a lumpectomy and as well as radiation therapy is increasingly preferred over a mastectomy.^[57] Radiation therapy uses high-energy beams to attack cancer cells. Only the treated cells are influenced by this therapy. After breast cancer surgery, radiation therapy may be used to remove any leftover cells in the chest region.

Brachytherapy

It is a form of radiation treatment. As enhanced partial breast radiation, it might be detected. Only the region

immediately surrounding the cancer is exposed to radiation. This could take the place of the need to irradiate the entire breast. Also, it reduces the amount of management session.^[58-59]

Chemotherapy

Chemotherapy is the term used to describe the method of using specific medications to kill cancer cells.^[60-61] To prevent or slow the spread of metastatic breast cancer, chemotherapy can be recommended. Moreover, it can be used to reduce some manifestations. Prior to or simultaneously with chemotherapy, various forms of treatment can be started.

Complementary therapies

Sometimes breast cancer patients want to supplement their medical treatment with complementary therapies.^[62] Randomized clinical trials are generally not carried out to investigate these treatments.^[63] Some women feel that some of these therapies have been beneficial to them. Complementary therapies include vitamins, nutritional supplements, yoga, meditation, visualisation, traditional drugs, and acupuncture.^[64]

Targeted therapies

These medicines are prescribed to treat some forms of breast cancer. The medication Herceptin is the most widely used targeted therapy.^[65] It is prescribed to treat breast cancer that is HER2 positive. It works by inhibiting the growth and spread of the cancer cells.^[66]

Oncogenes inactivation

A wide range of cancers have been connected with several oncogenic proteins. The use of antisense alternatives is a common and effective clinical study method.^[67] Adenoviral gene E1A can stop the transcription of oncogenes (Cancer causing gene) and erbB-2, which is a useful strategy for treating cancers that overexpress this oncogenic protein.^[68]

Cancer stem-cell therapy for breast cancer

The cancer stem cell theory has a foundation because of current research in breast biology.^[69] According to this concept, cancer develops in progenitor cells or mammary stem cells as a result of a dysregulation of the process of self-renewal, which is usually highly regulated. The early detection, prevention, and management of human breast cancer are significantly impacted by the cancer stem-cell theory. Both sporadic and hereditary breast cancers are influenced by dysregulation of stem cell renewal mechanisms. These aberrant stem cells could function as targets for the development of more effective cancer preventive actions. Also, the development of additional effective treatments for breast cancer may need the effective targeting of this cell type because breast cancer stem cells may be particularly resistant to chemotherapy and radiation.^[70]

Immunotherapy

It prevents cancer cells by making use of the body's immune system. One such example is the cancer vaccine. For the creation of vaccinations, cancer cell fragments or whole cancer cells are used.^[71] These cells stimulate the immune system of the body to help fight and eliminate cancer cells.^[72] In the treatment of breast cancer, immunotherapy has grown significantly. HER2 over expressing breast cancer therapy currently includes HER2 targeted treatment as a key component.

Anti-oestrogens and prevention of breast cancer

Many studies assessed the use of anti-oestrogens as a mediator to prevent breast cancer in high-risk females as a result of their success in the treatment of breast cancer.^[73,74] Antioestrogens are currently recommended as a kind of chemotherapy for women who have abnormal hyperplasia, a hereditary tendency to cancer, and a significant family history of breast cancer. Moreover, they are administered as part of the post-operative concomitant management of patients with oestrogen receptor positive cancers for a period of five years after surgery.^[75]

Breast cancer prevention

On the basis of the correlations of these factors with decreased risk, lifestyle modification (physical activity, avoiding postmenopausal obesity, dietary change, and vitamin supplementation) has also been recommended as a method of preventing breast cancer. Long-term lifestyle change is doubtful, although motivated women are likely capable of making moderate changes. A slight (9%) but statistically insignificant reduction in breast cancer risk was seen in a Women's Health Initiative randomised trial of diet fat reduction; more devoted women experienced a bigger benefit. There is no proof that vitamin D supplementation reduces the incidence of breast cancer, according to randomised trials.^[76-78]

CONCLUSION

Increasing women's awareness of how their behaviour affects the development of breast cancer and educating them about how they can control the disease by changing their habits are important aspects of the fight against it. The development of breast cancer is increasingly influenced by lifestyle and environmental variables, in part because of the modern way of life and a variety of easily accessible stimulants.

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