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UNDERSTANDING AND AWARENESS OF BREAST CANCER TYPES AND ASSOCIATED CONDITIONS (REVIEW)

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Abstract
The most frequent cancer among women that poses a serious risk to their life right now is breast cancer diagnosed globally. A particular type of cancer that begins as a tissue-wide cell proliferation. Breast cancer, however, does not just affect women. Survivability as a percentage has been rising over time. Furthermore, there is a slow decline in the incidence of casualties from cancer of the breast. Growing public awareness and screening efforts have made early diagnosis possible. There are numerous ways to prolong life even in cases where breast cancer cannot be cured. The significant drop in breast cancer mortality rates can be attributed to improved treatment options, early detection, and increasing awareness. Advances in breast cancer research are assisting medical professionals in selecting the most efficacious treatment regimens with the aid of new discoveries and research.
Keywords: Tumor, Early diagnosis, Malignancy, Carcinoma of Breast.

Introduction

Breast lobes, milk ducts, or, in some cases, the tissue in between, can all be the source malignancy of breast. The several forms of carcinoma of the breast, such as aggressive, invasive, metastatic, and intrinsic or molecular subtypes, are covered in this review paper.

Ductal Carcinoma In Situ (DCIS)

"Ductal carcinoma" associated with milk ducts. Since DCIS hasn't broken through the healthy breast tissue that covers the milk ducts, it is regarded as "non-invasive" (van Seijen, etal. 2019). These tissues include breast tissue. DCIS does not immediately pose a threat to your life, but it can raise your chances of later developing invasive breast cancer. The word "in situ" refers to the cancer "in its original location" (van Seijen, etal. 2019). Compared to someone who has never had breast cancer, you have a larger probability of the cancer coming back or establishing a new instance if you have had DCIS. Nine months to ten years after the first diagnosis is when most relapses happen. Less than 30% of cases will recur, according to (Vinay et al. 2010) and Lakhani et al.(2012). If radiation therapy is not administered, ladies with DCIS who had lumpectomies, or breast-conserving surgeries, have a 25–30% probability of experiencing a recurrence in the future. Approximately 50% of recurrent DCIS cases are noninvasive (recurring DCIS) while the other 50% develop into invasive

illness after DCIS therapy (Lakhani, et al. 2012).

Invasive Ductal Carcinoma, Use The Acronym IDC.

Approximately 80% of instances are Ductal invasive carcinoma is referred to as IDC is defines as invasive having "invaded" or spreaded to the breast tissue around it. "Ductal" cancer is defined as cancer that has spread to the milk tubes" called ducts (Rosai, 2011). When cancer has entered the breast tissue and broken through the walls of the milk duct, it is often referred to as "invasive ductal carcinoma" (Rosai, 2011). In addition to the lymph nodes, invasive ductal carcinoma has the potential to spread to other body areas over time (Lakhani, etal. 2012). Women can be affected by it at any age, although the incidence of invasive ductal carcinoma increases with age. Women 55 years of age or older account for almost two thirds of cases of breast cancer that has spread. According to researcher invasive ductal carcinoma is also possible in men (Helvie, et al. 1993). Important technologies that have greatly influenced the management of IDC include diagnostic imaging used in diagnosis, and development of specific therapies that cause minimal side effects. Knowledge of the statistical factors, of which age and gender are included, may assist in early identification of people who require extra and frequent health check-ups (Lakhani et al., 2012).

IDC Type Breast Tubular Cancer

The term "tubules" refers to tube-like growths that are often very small (less than 1 cm) and usually indicate tubular cancer. These tumors usually contain low-grade cells, which develop more slowly and resemble typical, healthy cells in appearance. In the past, tubercular carcinoma was the cause of 1%–4%. But because screening mammography is now more widely accessible, tubular carcinoma is found more frequently—oftentimes before a lump is felt by you or your physician. Although exact statistics are unavailable, research indicates that tubular carcinoma is less common in men and may represent fewer than 8% to 27% of all breast cancer cases. While women can be diagnosed at any age, data indicates that the early 50s are the typical age at which tubular cancer is diagnosed. Although tubular carcinoma a kind of carcinoma of the breast that is lethal, it typically responds well to treatment. With this feature and given the availability of modern therapeutic regimens, the prognosis is favorable for patients with this type of breast cancer (Rakha et al., 2010; Silverstein, 2003).

IDC Type: Breast Medullobar Cancer (MBC)

Three to five percent of all instances of carcinoma of breast are invasive ductal carcinoma, which includes medullary breast carcinomas. An unusual kind of the illness known as "cancer that starts in the milk ducts and spreads beyond." The tumor is called "medullary" cancer because of its resemblance to the medulla, a soft, fleshy part of the brain (Pedersen. etal. 1995). A BRCA1 mutations doubles a woman's likelihood of suffering medullary cancer. Although it can affect anyone at any age, women with ovarian cancer usually get the disease in their late 40s or early 50s. According to projections, approximately 1,384,155 while recent instances and in nearby areas 459,000 deaths were reported (Abdul Rashid, etal. 2009 and Rezaianzadeh, etal. 2014). Histologically speaking, there is a great deal of variability in breast cancer cases; some grow slowly and have excellent prognoses, while other tumors may have a very aggressive clinical history (Verma, etal. 2012). The most prevalent cancer among women in the Middle East is breast cancer. Medullary breast carcinoma (MBC) was initially identified by Ridolfi et al. being one among the most aggressive and deadly forms of carcinoma of the breast (Ridolfi, etal. 1977). Though haemorrhage and necrosis can occasionally be observed, MBC is well-defined, soft in substance, and has a uniformly grey, wet cut surface. Tumor cells are big when viewed histologically. A substantial lymphocytic infiltration of the tumor stroma is the defining hallmark of MBC (Foschini and Eusebi 2009; Malyuchik and Kiyamova 2008). The characteristics of MBC include a big tumour size, high nuclear grade, and young age. MBCs appeared to have a notably larger percentage of the triple-negative phenotype (Wang, etal. 2016). Although exhibiting traits similar to highly aberrant and aggressive cancer cells, medullary carcinoma cells typically have a high quality appearance coupled with poor behavior. Because they do not proliferate quickly and do not typically migrate to lymph nodes outside of the breast, medullary carcinoma cells are frequently simpler an effective treatment

is available to compare to various kinds of carcinoma of the breast (Foschini and Eusebi. 2009; Malyuchik and Kiyamova. 2008).

IDC Type Breast Mucinous Carcinoma

Breast cancer with mucins is an uncommon malignancy of duct also known as Breast Mucinous Carcinoma. The hallmark of this disease's dissemination from the milk ducts to adjacent healthy tissue. It is also known as colloid carcinoma. The aberrant cells that make up the tumor in this type of cancer "swim" in a puddle of mucus, the main ingredient in the slimy, slick mucus (Atif, etal. 2021). A large portion of our bodies' interior surfaces, such as the liver, lungs, digestive tract, and other important organs, are usually covered in mucus. The majority of cancer cell types, including the majority of breast cancer cells, secrete very little mucus. On the other hand, in mucinous carcinoma, the breast cancer cells are encased and integrated into the tumor by the mucin. Cancer cells appear to spread in mucus pools under a microscope (Diab et al., 1999). Approximately 2 to 3 percent of breast tumors that have spread are "absolute" mucinous carcinomas, which indicate the tumor is made entirely of one kind of malignancy, according to research (Atif, etal. 2021). Mucous cells appear to be present in about 5% of invasive breast tumors; however, other types of cancer cells are also present. Male mucosal cancer is quite uncommon. Mucosal carcinoma is less likely than other forms of breast cancer to spread to the lymph nodes (Di Saverio et al., 2008). Although invasive, mucinous carcinoma often acts less aggressively and heals more quickly. Mucinous carcinoma is seen in all age groups, though more commonly in postmenopausal women and hence underscoring the significance of patient’s age while handling the disease (Atif, etal. 2021; Di Saverio et al., 2008; Fu et al., 2013).

Type IDC Cylindrical Breast Cancer

When invasive cribriform carcinoma occurs, cancer cells nestle between the ducts and lobules in the breast's stroma, or connective tissue. The tumor resembled Swiss cheese because of the holes that emerged from the cancerous cells. Since most invasive cribriform carcinomas are low-grade, they resemble normal, healthy breast tissue in both appearance and behavior. Between five and six percent of instances of invasive breast cancer may be scalloped cases but is also a prevalent variant. it has been found that patients belonging to this subtype of invasive ductal carcinoma have relatively low risk of recurrence and metastasis, which also points to the fact that there is a need to classify the tumors according to their histopathological types in order to plan the treatments effectively (Rakha et al., 2010).

Lobular Carcinoma Invasive (ILC)

After invasive ductal melanoma (cancer that starts in the milk tubes and extends outside of them), invasive lobular melanoma Infiltrating Breast cancer with lobular metastases is the next fastest growing kind is also referred to as (ILC) invasive lobular carcinoma (ILC) (Borst and Ingold, 1993; Martinez and Azzopardi, 1979). Breast cancer that appears frequently. Lobular neoplasia is said to be "in situ," which hasn't spread outside of its original site. The breast's milk glands, or lobules, have a marked rise in cell count known as LCIS. When a cancer is classified as invasive, it means that it has "invaded" the breast tissue around it. "Invasive lobular carcinoma" is a term that's employed to characterize varieties of carcinoma through the lobule walls and started to penetrate the breast tissue (Borst and Ingold, 1993 Martinez and Azzopardi, 1979). Although it can strike women at any age, older women are more likely to be affected by invasive lobular carcinoma (Helvie et al., 1993). The malignancy may eventually spread to the lymphatic system and maybe other organs and regions as an invasive malignancy (Harake et al., 2001). Men and women 55 years of age or older account for around two thirds of all instances of breast cancer that is invasive (Harada et al. 2001). When there is an invasive malignancy, the surrounding breast tissue has been "invaded" by the cancer. Hormone replacement medication may raise the incidence of ILC during and after menopause and these characteristics is essential for specific treatments to be designed and increasing

the precision of the diagnosis of this type of breast cancer (Harake et al., 2001; Li et al., 2000).

In Situ Lobular Carcinoma (LCIS)

An area (or regions) of abnormal cell growth likelihood of an aggressive course of carcinoma of the breast in later life (Perou, et al., 2000). The aberrant cells known as "lobules" that have begun to proliferate in the glands that produce milk at the end of milk ducts and it begins in the tissues that protect internal organs, such as breast tissue, or the skin. A malignant growth that stays "in situ," or "in its original location," within the lobule if it does not invade the surrounding tissue (Hanby and Hughes. 2008). When someone is diagnosed with LCIS, more than one lobe is typically damaged (Harake, etal. 2001). Though "carcinoma" appears in the nomenclature, LCIS and actual breast cancer are not the same.

On the other hand, LCIS suggests that a person may raises the possibility that a person will eventually develop a higher risk of breast cancer. Some medical professionals would rather name "lobular neoplasia" than "lobular carcinoma". Less than 10% of women with LCIS have had menopause, despite the fact that the bulk of instances occur in the 40–50 age range prior to menopause (Hanby and Hughes. 2008). Men rarely have LCIS (DeSantis, et al., 2019). Although LCIS is thought to be uncommon, it is unclear how common it is. Largely due to LCIS's discreet presentation and the fact that it may be asymptomatic and difficult to identify, it is crucial to have individual tailored screening and follow-up plans. Current research in the molecular aspect of LCIS may in the future make it possible to better define risk factors, and introduce specific preventative interventions(DeSantis, et al., 2019).

Inflammation and Breast Cancer in Tandem

One kind of breast cancer is called Inflammatory Breast Carcinoma (IBC). One harsh and uncommon variant. Instead of being immediately apparent as a lump, the symptoms of inflammatory breast cancer typically start off as breast redness and swelling. IBC usually spreads quickly, and symptoms can get worse in a matter of hours or days. It's critical to notice the symptoms and seek out emergency medical attention. Remember that treatment options are better now than they were in the past, even though this type of particularly deadly type of carcinoma of the breast. IBC can also strike men, much like other types (Resetkova, 2008; Rosen, 2001).

Inflammatory Breast Carcinoma is peculiar and seems to be aggressive since it may present without the normal symptoms like a breast lump, the prognosis being worsened. However, due to the fast growing nature of IBC especially in the African region and its close resemblance with an infection, diagnosis in its early stage is difficult but very vital. In addition, equity in diagnostic patterns like onset at a younger age in Black women shows dire importance for screening programs and awareness in at-risk populace. Some current studies indicate that there is some association between obesity and higher body mass index and the risk of IBC and therefore targeted lifestyle intervention could form part of general cancer prevention measures (Hance et al., 2005).According to a 2008 study, a higher body mass index raises the risk of IBC (Resetkova, 2008).

Male Breast Carcinoma

Under one percent of incidences of breast cancer impact men. Tissue from the breast does exist is present in both males and women (Bevier, etal. 2012; Niewoehner, .etal. 2008). Breast-stimulating hormone is generally not produced in large quantities by the bodies of boys and men. As such, the majority of their breast tissue is flat and little hormone levels, men may occasionally acquire genuine mammary glands (Sørlie 2004). Because male breast cancer is uncommon, only a small percentage of cases necessitate more research. Male patients are diagnosed later and the major reason is lack of awareness of symptoms such as a lump or changes in breast tissue. There has been little work done about male breast cancer but current study is starting to generate useful data on risk factors such as genes BRCA. Such factors can help in the formulation of preventive measures and management strategies in respect of at-risk males (Giordano et al., 2004).

Paget's disease

Regarding this disease, which is unique malignancy arises when cancer cells build up in or around the nipple. The cancer typically begins in the nipple ducts, which are tiny tubes that produce milk, and then spreads to the surface of the nipple as well as the areola, the dark area of skin that encircles the nipple. The areola and nipples are typically red, scaly, itchy, and irritating, (Serour et al., 1988; Lloyd etal. 2000; Piekarski etal. 2003; Seetharam and Fentiman 2009). Since more than ninety seven percent of people may get invasive or DCIS when they have Paget's disease in another area of chest, it is critical to recognize the symptoms. Abnormal alterations in the areola and nipple are frequently indicative of breast cancer (Serour et al. (1988). In addition, physicians remain puzzled about the cause or course of male Paget's illness. One theory is that the cancer cells began to multiply in the breast's milk ducts before moving to the nipple's surface. This would seem to explain why so many individuals with nipple-based Paget's disease also have metastatic breast cancer. Additionally, the nipple cells could develop malignancy. The tiny proportion of individuals who either have only nipple Paget's disease or have a second breast cancer that seems to be totally unconnected to nipple Paget's disease may be explained by this theory (Serour et al., 1988; Piekarski etal. 2003; Seetharam and Fentiman 2009). However women are more likely to be affected than men (Serour et al. 1988). This illness typically shows symptoms over fifty. Men receive their diagnosis at age 69 and women at age 62 (Serour et al. 1988). Present management modalities therefore include surgery with the use of adjuvant radiotherapy or chemotherapy based on the stage of the disease and involvement of breast cancer.

Hereditary Carcinoma of Breast

Luminal carcinoma of breast is indicated by reduced expression Ki-67 protein, this regulates the rate at which malignant cells divide. Decreased Ki-67 protein levels, which assists in identifying Luminal breast cancer, regulate the pace of cancer cell proliferation. High levels of Ki-67, HER2 positivity or negativity are located on hormone receptors are characteristics of Luminal B breast cancer. Compared to Luminal A malignancy, Luminal B carcinoma frequently grows a little faster and has a somewhat worse prognosis (Arteaga, etal. 2011; Soomin, etal. 2020; Misung, etal. 2022). Receptors Progesterone and estrogen hormone as well as HER2 are absent in breast cancer that is triple negative or basal. This kind of cancer strikes women more frequently in individuals who have gene alterations that codes for BRCA1. ER positive, and given the paucity of information about the drug's benefits in BRCA carriers, patients who would prefer not to have risk-reducing surgery may find that using Tamoxifen is a possibility. (Phillips, et al. 2013; King, et al. 2001). Estrogen receptor (ER) and progesterone receptor (PR) are the two hormonal receptors that are expressed by around 80% of breast tumours, which is known as hormonal receptor-positive disease (Ignatiadis and Sotiriou, 2013;Perou .2000). By attaching to the promoters of particular gene sets, ligand-activated transcription factors PR and ER both increase the expression of those gene sets (Jacobsen and Horwitz.2012). There is still discrepancy in certain breast tumours despite the fact that ER and PR expression were frequently highly consistent and closely associated. According to reports, just 2% of PR-positive breast cancers were ER-negative, but 15% of ER-positive breast cancers were [4], indicating that ER is more commonly expressed than PR. In fact, ER+/PR-status hormonal receptors are present in roughly 12% of all breast cancer patients (Li Y. etal. 2020). The loss of copy number in the PR-encoding PGR gene is one of the potential pathways for PR loss. The prognosis for HER2-enriched tumors is poorer, and their growth rate is faster. Certain malignancies can be successfully treated with targeted medicines including Enhertu (famtrastuzumab-deruxtecan-nxki), Herceptin (transtuzumab), Perjeta (pertuzumab), Tykerb (lapatinib), Nerlynx (neratinib), and Kadcyla (chemical name: T-DM1 or adotrastuzumab emmisine). HER2 negative, positive for hormone receptors and race levels of the protein Ki-67 (which aids in controlling the rate of cancer cell multiplication) are characteristics typical of carcinoma of the breast which is shared with Luminal A disease. The prognosis for normal breast cancer is reasonable, although not as good as that of Luminal A cancer(Misung, etal. 2022;Soomin, etal. 2020; Arteaga, etal. 2011).

Triple Negative Carcinoma

Triple negative carcinoma of the breast is classified by having overexpressed levels of HER2, progesterone, and estrogen. These results imply that neither the HER2 protein nor the progesterone or estrogen hormones are responsible for the development of cancer. Therefore, medications that target the HER2 protein receptor or interfere with hormone therapy are ineffective when treating breast cancer that is triple-negative (Arteaga, etal. 2011; Soomin, etal. 2020; Misung, etal. 2022). Nevertheless, a number of drugs can be used to treat this carcinoma successfully. Cases of breast cancer that are triple negative account for ten to twenty percent of cases. Hormone receptors and HER2 amplification are not present in TNBC so chemotherapy becomes the mainstay of systemic therapy for this breast cancer subtype and may require higher doses of the chemotherapy regimen than other subtypes of breast cancer. the discovery of new genetic and molecular characteristics of TNBC resulted in new approaches to treatment, including those targeting specific signaling pathways and DNA repair mechanisms (PARP inhibitors) and immune, or immunological, therapy (Lehmann et al., 2011).

Phyllodes Breast Tumor

A rare type of breast tumor is called a Phyllode tumor. Carcinomas begin in the connective tissue of the breast, known as the stroma, and progress to the ducts or lobules. A tiny portion are malignant (cancer), however the majority are benign (Guerrero et al., 2003; Khosravi-Shahi 2011). Less than 1% of breast tumors are phylloid tumors, which is an extremely unusual malignancy. The term "phyllodes," which translates from Greek to mean "leaf-like," refers to the way tumor cells proliferate similarly to leaves and occasionally referred to as a phyllodes tumor or phyllodes cystosarcoma (Plaza et al. (2015).

The majority of phylloid tumors are benign (non-cancerous) and some are borderline (between good and cancerous), a tiny percentage of them are malignant (cancerous). All three forms of Phyllodes carcinoma tend to grow quickly and need to be surgically removed in order to lower the risk (Guerrero et al. (2003). Although phylloid tumors can occur at any age, women in their 40s typically have their first symptoms. Men rarely have phylloid tumors (Guerrero, et al. 2003). Phyllodes tumors are treated through wide local excision with ‘margin-free’ status, and in rare circumstances, mastectomy due to size and recurrence of tumor. Current research is directed at dissecting the molecular and genetic profiles of the phyllodes tumors in hope of developing new therapeutic strategies in the future (Tan et al., 2022).

Recurring Breast Cancer

Often referred to as simply "recurrent breast carcinoma," recurrent breast cancer is defined through the recurrence of cancer to the same or opposite breast or chest wall following an unknown amount of time without a diagnosis (van Denderen etal. 2013). Surgeon eliminates all palpably felt and detectable cancer during the lumpectomy or mastectomy treatment, which is performed to reverse the original diagnosis of breast cancer. After surgery, some of the tiny cancer cell clusters might still be present, and the tumor might not respond well to cancer tests (Arteaga, etal. 2011; Soomin, etal. 2020; Misung, etal. 2022). The possibility of isolated cell clusters being resistant to chemotherapy and radiation would lessen the chance of recurrence. Even treatment-resistant cells have the capacity to multiply and eventually develop into tumors (van Denderen etal. 2013).

Three General Sites Are Where Most Breast Cancers Might Recur

Recurrences in the same breast area where breast cancer was initially detected are referred to as local recurrences. A regional recurrence is a cancer that was originally found in lymph nodes in the armpit or collarbone area. Some medical professionals may refer to a recurrence of breast cancer as "locoregional" since they think many of the symptoms are comparable

between a local and regional recurrence. This also includes a different body part, such as he brain, lungs, bones, or, in severe cases, the other breast. Additionally, there's a chance that the HER2 status and the initial breast cancer are unrelated (Foschini et al., 2016). It can switch from being hormone-receptor-positive to hormone-negative depending on the hormone-receptor state (Arteaga, etal. 2011; Soomin, etal. 2020; Misung, etal. 2022).

Metastatic Breast Carcinoma

An instance of the fourth stage of malignancy, commonly as metastatic breast carcinoma. Cancerous cells have the ability to separate from the lymphatic system, a huge network of blood vessels and glands that removes waste products, bacteria, and pathogens from cells and from their original tumor and dispersed to several bodily areas (Misung, etal. 2022; Soomin, etal. 2020; Arteaga, etal. 2011). Breast cancer in other body parts may return months or years despite detection and therapy. Metastases are found in about 30% female diagnosed with tumor in their breasts in its early stages. "De novo metastatic" refers to the situation where a person receives a breast cancer diagnosis for the first time (Cardoso et al., 2018). Breast cancer is not discovered until it has disseminated to numerous bodily areas (Misung, etal. 2022; Soomin, etal. 2020; Arteaga, etal. 2011). Tumors from breast cancer cells metastasize to other parts of the body. Consequently, in the event that breast cancer has spread to the bone, breast cancer cells rather than bone cells make up the metastatic tumor in that location. Receiving a metastatic breast cancer diagnosis can be upsetting; symptoms include anxiety, resentment, tension, wrath, and despair. Certain patients might be unhappy with their physician or themselves for being unable to recover from their illness, or they might be worried about the quality of care they are getting areas (Misung, etal. 2022; Soomin, etal. 2020; Arteaga, etal. 2011). Recall that metastases are NOT irreversible. Many individuals enjoy long, happy lives at this stage of the disease. There are numerous possibilities for treatment available for aggressive breast carcinoma and there is constant research being done on novel medications. Treatment for metastatic breast cancer is enabling an increasing number of patients to resume normal lives (Misung, etal. 2022; Soomin, etal. 2020; Arteaga, etal. 2011). Treatment can keep metastatic breast cancer under control for several years, even though it may not totally go away. The cancer might heal or become more aggressive at different times. Numerous treatments are frequently applied one after the other, in combination, or in chronological order.

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