

The Review on types of Breast Cancer and Associated Risk Factors

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Abstract:

Breast cancer is the most frequently diagnosed cancer in women Worldwide with more than 2 million new cases in 2020. Its incidence and death rates have increase over the last three decades due to the change in risk factor profiles, cancer is a result of uncontrolled growth of abnormal cell in the body caused by genetic and environmental factor. The two major pillars of breast cancer management are loco regional treatment and systemic therapy; the histological and molecular characteristics of breast cancer largely influence treatment decision. The molecular alterations that drive breast carcinogenesis are many, and several classification have been developed to group tumors accordingly as breast cancer is a global problem, major emphasis needs to be put on diminishing worldwide disparities in access to diagnosis, multimodal treatment and novel drugs. In this primer, we provide state-of-the-art information on the biology, diagnosis and treatment of early and metastatic breast cancer, emphasizing the necessity for multidisciplinary management of this heterogeneous disease. Treatment of breast cancer is complex and involves a combination of different modalities including surgery, radiotherapy, chemotherapy, hormonal therapy, or biological therapies delivered in diverse sequence.

Keywords: Breast cancer, risk factor, gene, prevalence, therapy.

INTRODUCTION:

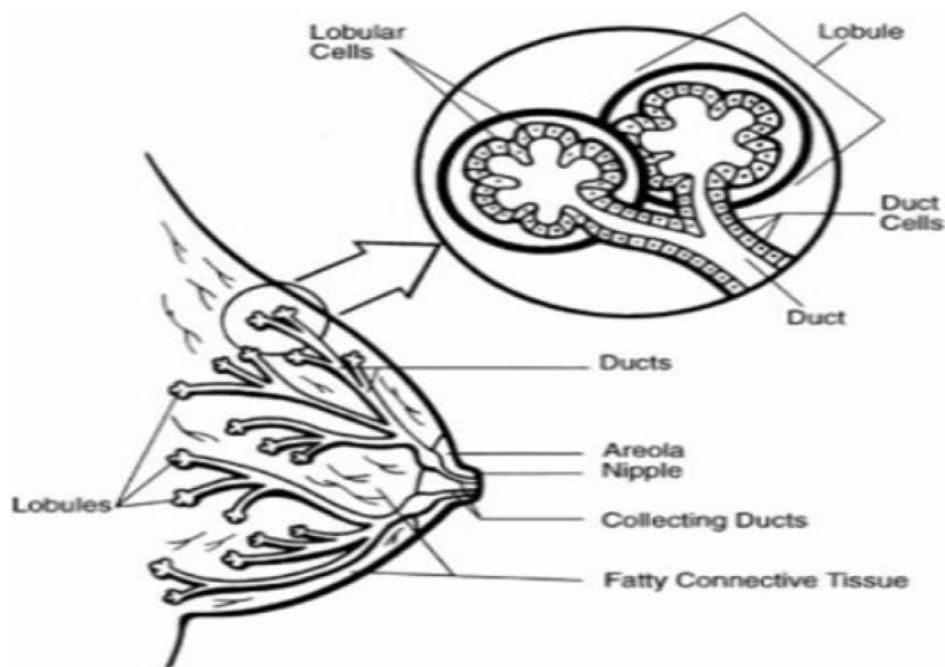
'Cancer' is characterized by uncontrolled multiplication and spread of abnormal forms of the body's own cell. It is second only to cardiovascular disease as cause of death in developed nation and one in every two people born after 1960 will be diagnosed with some form of cancer during their lifetime. According to cancer research UK 2016, over 356,000 new cases were reported in the United Kingdom in 2014 and mortality was in excess of 163,000 global figure, 8.8 million. Cancer is responsible for approximately 30 percent of all deaths in the United Kingdom. Lugs and bowel cancer and the commonest malignancies, closely followed by breast and prostate cancer. Statistic from most other countries in the developed world tell much the same story [1]. Being characterized by six major hallmark carcinogenesis might occur in every call, tissue, and organ, leading to the pathological alterations that result in a vast number of cancers. The major mechanisms that enable its progression include evasion of apoptosis, limitless capacity to divide, enhanced angiogenesis, resistance to anti-growth signal and induction of own growth signals, as well as the capacity to metastasis[2]cancer calls are formed from normal cell due to a modification/mutation of DNA and /or RNA. These modification/

mutation can occur spontaneously in Law of thermodynamic – increase of entropy or they may be induced by other factor such as; nuclear radiation electromagnetic radiation (microwaves, X-rays, gamma-rays, ultraviolet-rays etc.) viruses, bacteria and fungi, parasites[due to tissue inflammation / irritation, heat, chemicals cell-level injury, free radical, evolution and ageing of DNA and RNA, etc. All these can produce mutation that may start cancer. Cancer can be called therefore ‘Entropic Disease’ [3]

BREAST CANCER:

Usually, cancer is named after the body part in which it originated; thus, breast cancer refers to the erratic growth and proliferation of call that originated in the breast tissue [4] most breast cancer being in the calls that line the ducts (ductal cancers.) some being in the calls that line the lobules (lobular cancers.) while a small number start in the other tissues [5]. The breast cancer is composed of two main type of tissue i.e. glandular tissue and stromal tissue. Glandular tissues house the milk producing gland (lobules.) And the ducts (the milk passages.) while stromal tissues include fatty and fibrous connective tissues of the breast. The breast is also made up of lymphatic tissues-immune system tissue that removes cellular fluids and waste [6].

Fig 1.



TYPES OF BREAST CANCER:

Non-Invasive Breast Cancer:

Cell that are confined to the ducts and do not invade surrounding fatty and connective tissues of the breast. Ductal carcinoma in situ (DCIS) is a non- invasive or pre-invasive breast cancer. This means the cells that line the ducts have changed to cancer call but they have not spread through the walls of the ducts into the

nearby breast tissue. Lobular carcinoma in situ (LCIS) is less common and considered a marker for increased breast cancer risk [7].

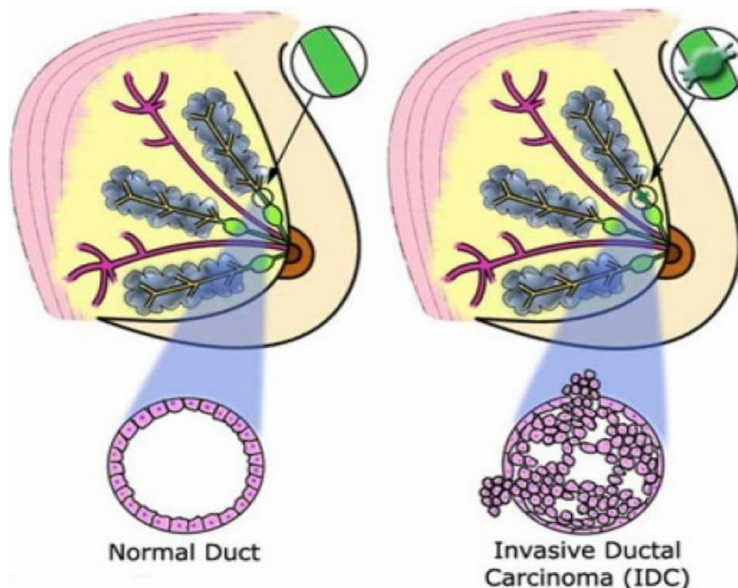
Invasive Breast Cancer:

Cell through the duct and lobular wall and invade the surrounding fatty and connective tissues of the breast. Cancer can be invasive without being metastatic (spreading) to the lymph nodes or other organs [8].

Ductal carcinoma in situ:

DCIS, the most common type of non-invasive breast cancer, is confined to the ducts of the breast. For example, ductal adenocarcinoma (lungs, and gastrointestinal tract) [9]

Fig 2.



Less commonly occurring Breast cancer:

Tubular carcinoma: Tubular carcinoma of the breast is a distinct relatively rare low- grade neoplasm, accounting for approximately 1 to 2 percent of invasive breast cancer.it is composed of well differentiated tubular structure with open Lumina, typically one layer thick surrounded by abundant stoma [10].

Medullary carcinoma: medullary carcinoma is an invasive breast cancer that forms a distinct boundary between tumor tissue and normal tissue. Only 5 percent of breast cancers are medullary carcinoma [11].

Inflammatory breast cancer: inflammatory breast cancer is a rare and very aggressive disease in which cancer cell block lymph vessels in the skin of the breast. This type of breast cancer is called ‘inflammatory’ because the breast often looks swollen and red, or inflamed. Inflammatory breast cancer is rare accounting for 1 to 5 percent of all breast cancer diagnosed in the United States [12].

Phylloides tumors: Phylloides tumors (also called Phylloides) are can either benign (non-cancerous or malignant) (cancerous). Phylloides tumors develop in the connective tissues of the breast and may be treated by surgical removal. Phylloides tumor are very rare; less than 10 women die of this type of breast cancer each year in the United States [13].

RISK FACTOR OF BREAST CANCER:

Family and breast cancer: Breast cancer is of the most important factors that risk physical, mental, and social health of women. Some therapeutic complications affect the patient's self-awareness, self-confidence, and sense of self-worthlessness and -acceptance. Suffering from disease, concerning about family future, fear of death, therapeutic complications, reduced performance, and mental imagery disorder are among factors that impair the mental health of patients with breast cancer [14]. Cancer is a disease that involves the whole family. Different studies have reported disruption in daily life of family caregivers. In a qualitative study, two main concepts were found from the experience of partners: concentration of the partner's illness and caring for her, and concentration on family to maintain it. Some marginal concepts in this study included presence, reliance on medical team, decision-making, and handling financial affairs [15].

Female sex: constitutes one of the major factors associated with an increased risk of breast cancer primarily because of the enhanced hormonal stimulation. Unlike men who present insignificant estrogen levels, women have breast cells which are very vulnerable to hormones (estrogen and progesterone in particular) as well as any disruptions in their balance. Circulating estrogens and androgens are positively associated with an increased risk of breast cancer [16].

Genetic Mutation: Several genetic mutations were reported to be highly associated with an increased risk of breast cancer. Two major genes characterized by a high penetrance are BRCA1 (located on chromosome 17) and BRCA2 (located on chromosome 13). They are primarily linked to the increased risk of breast carcinogenesis family history of breast cancer is the strongest one. Almost 20% of all breast cancers have family origin, and etiologically are dependent to a specific predisposing gene of that disease [17].

Cigarette smoking and breast cancer: Identification of Breast cancer, as the most important cancer in women, and exploring its risk factors have interested researchers for many year [18]. Carcinogens found in tobacco are transported to the breast tissue increasing the plausibility of mutations within oncogenes and suppressor genes (p53 in particular). Thus, not only active but also passive smoking significantly contributes to the induction of procarcinogenic events [19]. Breast cells differentiated from the parts 1 and 2 are susceptible to chemical mutagens that occur before menopause; whereas, those differentiated from the part 3 are mutagen-immune. According to this study, it is supposed that exposure period to breast carcinogens determines susceptibility to carcinogenesis. For example, an early exposure, especially before the first pregnancy, may end in breast cancer, due to genotoxic mechanisms; whereas, the subsequent exposures have protective effects because of anti-estrogenic characteristic of cigarette [20].

Nutritional factors and breast cancer: Among the nutritional factors, weight gain and high calorie intake are two causes of breast cancer development. Kopans and Greenwald put that obesity and high BMI in post-menopause increases the risk of breast cancer; whereas, there is not such relationship in pre-menopause women [21] for the first time in 1940, research findings showed that increased use of fat leads to breast tumor in animals [22]. Howe and Goodwin reported a positive correlation between high fat intake and the risk of breast cancer [23]. Another study reported a positive significant relationship between animal protein intake and the risk of breast cancer [24]. In general, the relationship with the risk of breast cancer development is uncertain [25]. On the one hand, calorie intake leads to weight gain and obesity; on the other hand, it results in increased height in childhood and preterm menopause. Both factors can establish the context for cancer development in future [26].

Alcohol Intake: Numerous evidences confirm that excessive alcohol consumption is a factor that might enhance the risk of malignancies within the gastrointestinal tract; however, it was proved that it is also linked to the risk of breast cancer. Namely, it is not alcohol type but rather the content of alcoholic beverages that mostly affect the risk of cancer [27]. The explanation for this association is the increased levels of estrogens induced by the alcohol intake and thus hormonal imbalance affecting the risk of carcinogenesis within the female organs [28]. Besides, alcohol intake often results in excessive fat gain with higher BMI levels, which additionally increases the risk. Other hypotheses include direct and indirect carcinogenic effects of alcohol metabolites and alcohol-related impaired nutrient intake. Alcohol consumption was observed to increase the risk of estrogen-positive breast cancers in particular [30]. Consumed before the first pregnancy, it significantly contributes to the induction of morphological alterations of breast tissue, predisposing it to further carcinogenic events.

CONCLUSION:

Breast cancer was and continues to be among the most prevalent and growing malignant diseases among Iranian women in the past four months. Breast cancer is a disease that involves the patient, family, and community, and wastes many financial and spiritual resources. This cancer is developed in breast tissues including ducts (tiny tubes that carry the milk) and lobules (milk-producing glands). Breast cancer is not gender-specific, but rarely develops in men. Although the exact cause of breast cancer is unknown, specific risk-factors have been identified. Different types of cancer have different risk factors. Some of these risk factors such as cigarette-smoking, alcohol use, and diet can be changed and depend on life style. However, other factors like age, race, gender, and family history are fixed and unchangeable. Having one or more of these risk factors does not necessarily mean infliction. This disease affects different physical, mental, and social aspects of women life. On the other hand, such factors as social and family supports during the illness can reduce its negative impacts.

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