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Original Research Article

Breast cancer, a systematic review of epidemiology, diagnosis, surgical treatments, radiotherapy and chemotherapy

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ABSTRACT

In breast cancer epidemiology, we study high-risk groups, geographical distribution and prevalence in Iran. Next, we examine the etiology of breast cancer, which includes three factors: hormonal, genetic, and environmental. Types of breast cancer include 1- Invasive carcinoma 2- Non-invasive carcinoma, each of which is divided into duct and lobular and there are other types that include medullary, mucosal, inflammatory and Paget carcinomas. We will examine each raga separately in the following. Following the types of breast cancer, we examine risk factors or risk factors, including, gene mutation, aging, personal and family history of breast cancer, premature menstruation, late menopause, and... each of which is discussed separately. Following are four stages of breast cancer and the clinical signs of the disease. Explain the screening and diagnosis, which includes: 1- Personal examination 2- Examination of the breasts by a doctor 3- Mammography 4- Galactography 5- Ultrasonography 6- Magnetic resonance imaging 7- Fine needle aspiration 8- Biopsy. We also describe separately the treatments that are performed for this disease today, which include: 1- Modified radical mastectomy 2- Breast maintenance surgery 3- Radiation therapy 4- Chemotherapy 5- Hormone therapy 6- Bone marrow transplantation in addition to future therapies.

Keywords: Breast cancer, Radiotherapy, Surgery, Chemotherapy

Introduction

Breast cancer is one of the most important diseases in women and knowing the basic information about it is necessary for every woman, even if she does not have this disease, because it is common and important. Today, despite information from newspapers, magazines, and radio and television debates about the symptoms of breast disease [1], women are still unaware of the disease and its symptoms, prevalence, and treatments. Although many women are more inclined to know the facts about breast cancer, fewer facts are drawn than the assumptions made to begin with [2]. For example, most breast lumps are not cancerous, and treatment for breast cancer does not always lead to breast augmentation, and for many women in the early stages of the disease, there is a chance of a real cure with new treatments. Many women also show signs of breast disease but are not really aware of their importance [3, 4].

Epidemiology of breast cancer

Geographical distribution: Breast cancer rates are higher in urban areas [5, 6]. Breast cancer shows a wide range of international changes, with the highest rates in North America and Western Europe and the lowest rates in Japan [7, 8]. African blacks are now less likely to get breast cancer than American blacks. Studies of Japanese immigrants to the United States have shown that the incidence of breast cancer between them gradually increases and reaches the level of American women after 2 or 3 generations [9]. The incidence of the disease is reported to be very low in most Asian countries. Statistics from the American Cancer Society show that more than 175,000 cases of breast cancer are diagnosed each year and 43,300 deaths occur due to the disease. About 1% of these cancers occur in men. In Iran, the prevalence of breast cancer in women 35 years and older is estimated at 0.66% in Shiraz and 12.6% of all cancers in Iran. In Iran, breast cancer is the third most common type of cancer in women after cervical cancer [10].

Etiology of breast cancer

Hormones: The role of hormones and their association with breast cancer is controversial and has been criticized and debated. Studies show a link between breast cancer and estrogen exposure. In laboratory studies, tumors grow much faster when exposed to estrogen, and epidemiological studies have shown that women who have been exposed to estrogen for a long

time have a higher risk of developing breast cancer [13]. Early menstruation at a younger age, no pregnancy, postpartum delivery, and late menopause are known to be minor risk factors. All of these factors are thought to prolong the period of contact with estrogen due to the continuation of menstruation. According to this theory, each menstrual cycle exposes breast cells to another opportunity to mutate, increasing the chances of getting cancer.

Invasive carcinoma: Invasive carcinoma of the ducts of the breast: It is the most common type of histology of breast cancer, which accounts for 75% of breast cancer cases. These tumors are noticeable due to their difficulty in touch. They usually metastasize to the axillary lymph nodes. Its prognosis is weaker than other types of breast cancer.

Invasive carcinoma of the breast lobules: Invasive carcinoma of the breast lobules is rare and makes up 5-10% of all breast cancers. These tumors are usually characterized by thickening and hardening of the breast tissue. They have several different foci. There may be several hard, thick centers in one or both breasts. Invasive carcinomas of the ducts and lobules of the breast usually metastasize to bone, lung, liver, or brain. However, lobular carcinomas may spread on the surface of the brain or other parts of the body.

Non-invasive carcinoma: DCIS is more common than lobular carcinoma and is histologically divided into two main subgroups: comedo and non comedo. But the non-comedo subgroup also has different forms. The use of breast retention surgery for invasive cancer is called breast preservation therapy, which is used for localized DCIS lesions. Currently, half of DCIS cases are treated this way, but the rate of local recurrence is about 15-20%. In some cases, only a lumpectomy [mass removal] may be performed. In each other, the decision varies.

Medullary carcinoma: It accounts for 60% of all breast cancers and grows in the capsule inside the mammary duct. This type of tumor can grow, but the prognosis is usually better.

Cancer musicin: accounts for 3% of all breast cancers. This type of tumor produces mucin and is slow growing. Therefore, its prognosis is more favorable than other types of cancer.

Tubular duct cancer: Very rare and accounts for only 2% of all breast cancers. Because metastasis of this tumor to the axillary lymph nodes is not common. Therefore, its prognosis is excellent.

Inflammatory carcinoma: It is a rare type of breast cancer [1-2% of cases] whose symptoms are different from the symptoms of other breast cancers. The tumor is localized, tender, and painful, and the breast becomes abnormally hard and enlarged. The skin above the lesion is red

and swollen. There is often nipple edema edema. These symptoms quickly intensify and force the woman to seek medical attention. While small breast tumors do not cause such conditions. The disease can spread rapidly to other parts of the body. Chemotherapy agents play an important role in controlling the progression of the disease. Radiation therapy and surgery are also used to control the spread of the disease.

Breast cancer staging: There is no doubt that smaller tumors that are diagnosed in the early stages guarantee the patient more hope of survival, regardless of the treatment that is provided to him. Some clinical evaluations can determine the stage of the disease at the initial examination. Simply put, stage 1 disease is limited to the breasts and the lumps are less than 2 cm in diameter, either without skin depressions or nipple stretch. In stage 2, the masses are less than 5 cm in diameter, or the masses are smaller, with the involvement of the axillary lymph nodes, which are motile. But they are not fixed to the surrounding tissues and can be treated in stages 1 and 2 and can be treated with Aggressive surgery and other treatments with toxic side effects such as chemotherapy or radiotherapy. Conical examinations are not completely reliable in diagnosing stages 1 and 2. In stage 3 breast cancer, it progresses locally so that the tumor or lymph nodes in the breast have infiltrated or other muscles and structures have infiltrated and are clearly fixed to them. In stage 4, a clear spread of the disease to other parts of the body is evident. Stages 3 and 4 are categorized as an advanced disease, and patient relief is done as part of a treatment goal that is healing [and not easily achievable]. Some surgeons use more practical techniques for staging. Tumors that are less than 1 cm in diameter and have not reached the lymph nodes, or if a small tumor is a rare tubular or mucinous subtype, better results can be predicted and are Minimal Risk. Medium-sized tumors with others between 1-2 cm and less than 4 axillary lymph nodes are involved. Other types than the above two are at risk [high risk]. In this system, when the patient is assessed as a minimal risk, he has a 95% chance of surviving 10 years after local surgery and rarely needs additional treatments with toxic side effects. Clinical staging can be performed by a more precise TNM system, depending on the condition of the tumor: nodules and metastases. This staging is recommended by the International Union [Aganist cancercu ICC], for example a tumor. It is small when it is confined to the breast and has no signs of lymph node involvement or tumor metastasis elsewhere.

Clinical signs: The only early sign of breast cancer is a small, palpable lump. This is the first symptom in 90% of breast cancer patients. Wrinkling and shrinkage of the skin, its shrinkage,

changes in skin color on the lesion, changes in the overall appearance of the skin, nipple deviation, serous or bloody discharge from the nipple, and abnormal scaling or rotation of the nipple inward. Symptoms are related to a lesion that is well established and has invaded adjacent tissue. An uncommon but very severe breast cancer called Inflammatory Carcinoma initially invades the breast lymphatics, giving the impression of a red, hot, completely swollen breast. In such cases, in the absence of mastitis associated with breastfeeding, the patient should be referred to a physician immediately. In advanced cases and delayed disease, the skin may be injured, resulting in necrotic tissue infection beneath it. Diffusion into the axillary lymph nodes occurs soon. Depending on the distribution of the lymph vessels, the malignant cells may spread rapidly and metastasize to the bone, lung, or brain. The discovery of large lymph nodes or pain in the ribs and vertebrae may first alert the patient to a problem. This is especially true if the lesion is deep in the breast tissue, or if the BSE is not a routine monthly or breast augmentation by a doctor. It is now believed that [1] finding a subsequent malignancy in the breast of the opposite side or the other side before it is metastatic is another primary tumor, and [2] it may have existed since the time of the initial malignancy, but because of its size. Or his position could not be identified [2].

Treatments

Modified radical mastectomy: Modified radical mastectomy involves the removal of all breast tissue along with the axillary lymph nodes. Large and small breast muscles remain intact. Prior to surgery, the surgeon plans the location and method of incision to allow more removal of the tumor and glands. The incision should be made in such a way that, while providing a better possibility of surgery, it does not create a large and visible scar with stretching and shrinkage. One of the goals of surgical treatment is to maintain the normal function of the hands, arms and shoulders on the affected side. During surgery, the skin and tissue flaps are manipulated with a large amount of tissue to ensure that the tissue survives, the bleeding stops, and the discharge drains properly [1]. If breast reconstruction is to be performed after a mastectomy, a reconstructive surgeon should be consulted before the mastectomy. After removing the tumor, the bleeding points are closed and the skin of the area is sewn to the chest wall. When the skin on the wound is not enough to close the wound, a skin graft is used to cover the wound. A non-stick

coating is applied to the wound and covered with a pressure bandage. Two drains are placed to drain the discharge in the axilla and under the upper part of the skin, and a portable suction device may be used; This suction device removes blood and lymph fluid that collects in the wound after surgery. An elastic bandage can be used to hold the dressing in place.

Breast maintenance surgery: Breast maintenance surgery, including a biopsy, a partial or segmental mastectomy, a quadrectomy [removal of a quarter of the affected breast], and removal of the axillary lymph nodes in tumors that are invasive, followed by the course of radiation therapy is for the treatment of microscopic disease and its remnants. The goal of breast maintenance treatment is to completely remove the tumor with a portion of the surrounding healthy margin while maintaining the appearance and beauty of the breast. The axillary lymph nodes are also removed through a semicircular incision in the underarm hair. Through another small wound created by the incision of a scalpel, a drainage tube is inserted into the axilla to drain lymph and blood. The dressing is placed on the breast and underarms and is protected by a bandage or surgical brace. Survival rate after breast maintenance surgery was adjusted to be radical mastectomy.

Conclusion

Radiation therapy: After breast-conserving surgery, a course of external beam radiotherapy is performed to reduce the chance of local recurrence and eradication of any microscopic remnants of cancer cells following removal of the tumor. Radiotherapy is necessary to achieve similar results to mastectomy. If radiation therapy is not contraindicated, the only treatment is mastectomy. With fixed ink, small marks are placed on the skin to determine the area where the radiation is emitted. Patients should be instructed on treatment and self-care methods regarding side effects and how to treat side effects. Radiotherapy is not common today following mastectomy, but it is still performed in some patients: when the mass has spread locally [chest wall involvement, multiple positive lymph nodes, or a large tumor larger than 5 cm]. Meter 2] Sometimes mastectomy patients may need chest wall radiation therapy, which is usually done after completing a course of systemic chemotherapy.

Chemotherapy: Chemotherapy is given to remove metastases and microscopic scattering of the disease. Although chemotherapy is usually performed after breast surgery, there is no single standard for the timing and sequencing of systemic chemotherapy and radiation therapy.

Continuous clinical trials can lead to the selection of the appropriate sequence with the best results. In chemotherapy regimens for breast cancer, a number of drugs are combined to increase the destruction of cancer cells and reduce drug resistance. The most commonly used chemotherapy drugs are a combination of cytoxan [C], methotrexate [M], fluorouracil [F], and doxorubicin [adriamycin] [A]. Pakli taxel [Taxol] [T] has also recently been added to chemotherapy drugs, and data from clinical trials have shown promising results. The CMF or CAF combination diet is a common treatment plan. AC, ACT [given first AC and then T], or ATC [all three drugs are given together] are other treatment programs that may be used. Decisions about chemotherapy are made based on the patient's age, physical condition, medical condition, and whether or not the patient is participating in a clinical trial. Chemotherapy methods are summarized in the table.

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