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Breast cancer

Student name :- Kranti Nandalal sonawane
Vrushali Dnyaneshwer bhabadMansi Kashinath sanap Suvarna Anna Pawar
Harshad santosha shinde

Abstract:

Breast cancer is the most frequently diagnosed cancer in women and ranks second among causes for cancer related death in women. The ability to identify and diagnose breast cancer has improved markedly. Treatment decisions which were based in the past predominantly on the anatomic extent of the disease are shifting to the underlying biological mechanisms. Gene array technology has led to the recognition that breast cancer is a heterogeneous disease composed of different biological subtypes, and genetic profiling enables response to chemotherapy to be predicted. Breast conservation became an established standard of care and the oncoplastic approach enables wide excisions without compromising the natural shape of the breast. Sentinel lymph node biopsy has replaced axillary dissection as the standard procedure to stage the axilla and spared many patients the excess morbidity of axillary dissection. Targeted therapy to the oestrogen receptor plays a major role in systemic therapy; pathways responsible for endocrine resistance have been targeted as well. Biological therapy has been developed to target HER2 receptor and combination of antibody drug conjugates linked cytotoxic therapy to HER2 antibodies. Meaningful improvements in survival resulted from the new effective systemic agents and patients with metastasis are likelyto have a longer survival.

Keywords: cancer, breast cancer, women, gene

Introduction:

Breast cancer is the most common cancer in women and is curable in 70-80% of patients when detected early.Advanced breast cancer that has spread to other organs is considered incurable with current treatments.Breast cancer is a heterogeneous disease on a molecular level, meaning that the molecular features of the cancer can vary from person to person.Features of breast cancer can include activation of human epidermal growth factor receptor 2 (HER2), activation of hormone receptors, and BRCA mutations.Treatment for breast cancer depends on what molecular subtype of breast cancer a patient has.Breast cancer is managed through locoregional and systemic therapy approaches.Systemic therapies include endocrine therapy, chemotherapy, anti-

HER2 therapy, bone stabilizing agents, and immunotherapy.Future treatments for breast cancer aim to individualize therapy for each patient based on the biology of their tumor and their response to early treatmentThe incidence of this disease in developed countries varies from 1 to 2 percent, with almost 5% yearly increase in less developed country -According to estimates, more than 7 million people globally die from cancer. It is predicted that the number of new cancerous cases rises from 10 to 15 million by 2020 Meanwhile, breast cancer is the most prevalent type of malignant neoplasms among women. with more than one million new cases per year In Iran, breast cancer accounts for the major type of cancer among women with the incidence of 21.4 or 32%Breast cancer is the most common type of cancer among women in the US with the incidence rate of 12.5%. The risk of an individual dying from breast cancer is 1-in-35 At present, thechance of developing breast cancer over lifespan is 12% (1-in-8).

Who is at risk?

Female gender is the strongest breast cancer risk factor. Approximately 99% of breast cancers occur in women and 0.5–1% of breast cancers occur in men. The treatment of breast cancer in men follows the same principles of management as for women.

Certain factors increase the risk of breast cancer including increasing age, obesity, harmful use of alcohol, family history of breast cancer, history of radiation exposure, reproductive history (such as age that menstrual periods began and age at first pregnancy), tobacco use and postmenopausal hormone therapy. Approximately half of breast cancers develop in women who have no identifiable breast cancer risk factor other than gender (female) and age (over 40 years).

Family history of breast cancer increases the risk of breast cancer, but most women diagnosed with breast cancer do not have a known family history of the disease. Lack of a known family history does not necessarily mean that a woman is at reduced risk.

Cancer and quality of life:

The World Health Organization (WHO) defines the quality of life as an individual's perception of his/her position in life in the context of the culture and value systems in which he/she lives and in relation to his/her goals, expectations, standards, and concerns . Cancer affects patients' quality of life to varying degrees. The major problems affecting patients' life quality are the mental and emotional impacts of illness, diagnostic and therapeutic measures, stress, pain, depression, and disease consequences on family, marital, and social relations, as well as the induced economic burdens, nutritional issues, and treatment complications. Determination of the quality of life of cancer patients can provide medical staff with a new solution in helping them become

independent in performing life affairs under critical and non-critical situations . Improvement of quality of life of cancer patients is the primary objective of medical and therapeutic cares. Maximization of job capabilities and improvement of functional status and quality of life of the patients are of the important tasks of health care team .

Breast cancer and its etiology:

Breast cancer is the most common type of cancer and the second leading cause of death. This disease is the primary cause of mortality among women aged 45–55 years , and is the second leading cause of cancer-induced death. The incidence of breast cancer is almost 1-in-8 women, requiring complete tissue removal, chemotherapy, radiotherapy, and hormone therapy most of the time . Breast cancer is a type of tissue cancer that mainly involves inner layer of milk glands or lobules, and ducts (tiny tubes that carry the milk) . The primary risk factors of cancer include age , high hormone level , race, economic status, and iodine deficiency in diet Breast cancer is a multi-stage disease, in which viruses play a role in one stage of this pathogenic process. In general,viruses are involved with different cancer types .

Female breast cancer has overtaken lung cancer as the most common diagnosed cancer worldwide. The estimated new breast cancer cases reached 2.3 million in 2020, accounting for 11.7% of all new cancers, and 684,996 cases died of it . In China, breast cancer was the most common malignancy among women, with an estimated number of 306,000 new cases occurring in 2016 . The incidence of breast cancer has increased since the widespread uptake of mammography screening and continues to increase with the aging of the population.Increased incidence of cancer in recent years and its impact on different physical, mental, and social dimensions of human life have turned it to a major problem of the century . 2020. Meanwhile, breast cancer is the most prevalent type of malignant neoplasms among women with more than one million new cases per year .

Breast Cancer Epidemiology:

According to the WHO, malignant neoplasms are the greatest worldwide burden for women, estimated at 107.8 million Disability-Adjusted Life Years (DALYs), of which 19.6 million DALYs are due to breast cancer. Breast cancer is the most frequently diagnosed cancer in women worldwide with 2.26 million [95% UI, 2.24–2.79 million] new cases in 2020 . In the United States, breast cancer alone is expected to account for 29% of all new cancers in women . The 2018 GLOBOCAN data shows that age-standardized incidence rates (ASIR) of breast cancer are strongly and positively associated with the Human Development Index (HDI) . According to 2020 data, the ASIR was the high”st in very high

HDI countries (75.6 per 100,000) while it was more than 200% lower in medium and low HDI countries (27.8 per 100,000 and 36.1 per 100,000 respectively) .

Breast Cancer: Current Treatment

Surgery is the mainstay of treatment of the early stages of breast cancer, and it ranges from lumpectomy to modified radical mastectomy. Surgery typically includes sentinel lymph nodes (LN) dissection for staging the extent of spread into the axilla. Adjuvant treatment using pharmacotherapy and radiotherapy is required for treating residual micrometastatic disease and reducing the recurrences rate. In 2013, the St Gallen International Expert Consensus on the Primary Therapy of Early Breast Cancer suggested that breast cancer may be classified into 5 subtypes: luminal A, luminal B with HER2 negative, luminal B with HER2 positive, HER2-enriched, and basal-like: triple

Negative Breast Cancer: Prognosis and Recurrence

Breast cancer prognosis largely depends on the stage at diagnosis and the HR status. Early breast cancer (stages 0 and I) generally has a favorable prognosis, and the 5-year survival rate is close to 100%. The 5-year survival rates dramatically decline with higher stages of breast cancer, with the rates for stages II, III, and IV being approximately 93%, 72%, and 22%, respectively. 7 The 5-year survival rates are the highest for ER-positive and PR-positive cases, and lowest for ER-negative and PR-negative cases, across all stages of breast cancer.

Pathology Variables:

As part of the Pathways Study, the hematoxylin and eosin slides from each patient were centrally reviewed by a single breast pathologist (T.K.). Several variables were recorded during pathological review. Nottingham grade was scored from 1 to 3, incorporating the tubular formation, nuclear pleomorphism, and mitotic count.8 Histologic type was classified following World Health Organization criteria, including invasive carcinoma of no special type (IC-NST) (ductal), lobular, tubular, mucinous, cribriform, papillary, carcinoma with apocrine differentiation, micropapillary, micropapillary or mucinous, metaplastic, acinic cell, adenoid cystic, mucoepidermoid, secretory, tall-cell carcinoma with reverse polarity, neuroendocrine, microinvasive, and mixed. To have qualified for special type, the special type component needed to account for more than 90% of the tumor. To have qualified for mixed type, the special type component needed to account for

10% to 90% of the tumor.9 The percentage of ductal carcinoma in situ (DCIS) was also recorded. The percentage of TILs (on a scale from 0% to 100% with 10% increments) was recorded following the international TILs working group 2014. In short, to calculate the percentage of TILs, the stromal component was considered the denominator (areaoccupied by mononuclear inflammatory cells over total intratumoral stromal area). TILs were evaluated in the vicinity of the tumor with excluding surrounding tissue, normal epithelium, and DCIS.Diagnosis Of Breast Cancer:The best way to know about breast cancer is through early screening. The different types of breast cancer screening testsinclude:

Physical examination of the breast

Breast self-examination (BSE), as the name suggests, is a breast cancer screening test that can be done by oneself and at home. It usually takes 5-10 minutes and should be done every month by all women above 15 years of age.Stand topless in front of a mirror with your hands on your sides and shoulders straight.Look at your breasts in the mirror for any visual changes in the breasts such as dimpling, inverted nipple, puckering, andchanges in the size, shape or symmetry Delivering Overview

Any changes in the breast or nipples, lumps in the armpit, pain in the breast or nipples should not be ignored as it could be a symptom/s of breast cancer. Breast cancer affects breast tissue that contain milk producing glands called lobules and thin tubes called ducts. In breast cancer, the cells start growing and dividing in an uncontrolled way. These cancerous cells often invade other healthy breast tissue and lymph nodes, and can spread to other parts of the body.Breast cancer usually affects women but can also occur in men and children, though it is very rare. It is believed that 1 in 22 women in urban areas and 1 in 60 women in rural areas are likely to develop breast cancer during their lifetime. Breast cancer can be detected with the help of screening tests.

Key Facts:

1) Usually seen in Adults above 40 years of age

2) Gender affectedBoth men and women but more common in women3)Body part(s) involvedBreast

4)Prevalence Worldwide: 2.1 million (2018) India: 0.13 million (2015)5)Mimicking Conditions

6) Circumscribed breast lesions

7) Benign breast disease (fibroadenomas and cysts)8)Breast lymphoma

9) Metastasis to the breast from other primary sites (neuroendocrine orextramedullaryacute myeloid leukemia)

10) Necessary health tests/imaging11)CA 15.3

12)CA 27.29 (Breast cancer marker)13)Mammography

14)MR Mammogram

Treatment

1)Chemotherapy: Cyclophosphamide, Vinblastine, Fluorouracil & Gemcitabine2)Radiation therapy

3)Hormonal therapy: Tamoxifen, Fulvestrant, Letrozole & Megestrol4)Targeted therapy: Trastuzumab,

Pertuzumab, Neratinib & Alpelisib5)Immunotherapy: Pembrolizumab, Atezolizumab & Pertuzumab

6)Surgery: Mastectomy, Breast conserving therapy & Breast reconstruction therapy7)See All

Symptoms Of Breast Cancer

Although breast cancer may not show symptoms in the early stage, there are certain changes that happen

in the breast as you age. Knowing about these changes in the breast can help in the early detection and treatment of cancer.

Here are some of the common signs and symptoms of breast cancer every woman needsto be aware of:

Presence of a lump in the breasts that feels different from the rest of the breast tissue 1)Changes in the size, shape, or appearance of the breast

2) Inverted, painful, or enlarged nipple
3) Any discharge or bleeding from the nipple
4) Skin dimpling or appearance of folds on breast skin5)Pain around the breast/s

Swollen lymph nodes (in underarms and around the collarbone) may indicate that thecancer has spread.

Risk Factors For Breast Cancer:

Most people believe that genes put you at risk of breast cancer and it cannot be prevented. But in reality, only 5-10% of the cases of breast cancer have genetic predisposition. In the remaining 90% which are known to be sporadic breast cancers, the identified risk factors can be managed. The factors that increase the risk of breast cancerinclude:

Being woman as they are much more likely to develop breast cancer than men.

Old age as the risk increases with age. Most breast cancers are diagnosed after the ageof 50.

A personal history of breast conditions like lobular carcinoma in situ (LCIS) or atypical hyperplasia of the breast.

A personal history of breast cancer. Also a history of cancer in one breast, increases the risk of developing cancer in the other breast.

A family history of breast cancer or ovarian cancer. The risk for breast cancer increases if your mother, sister, or daughter or any family members have had breast or ovarian cancer. Also having a first degree male relative with breast cancer elevates the risk.

Presence of certain harmful mutations of genes [Breast Cancer genes 1 and 2 (BRCA1 and BRCA2)]. For example, BRCA2 mutation in women carries a lifetime risk of approximately 26% to 84%.

Having dense breasts.

Early menarche (before 12 years) or delayed menopause (after 55 years).Never being pregnant or having the first child after 30 years of age.

Smoking and excessive alcohol consumption.Obesity.

Hormone therapy after menopause (estrogen with progestin).

A personal history of radiation therapy especially to the head, neck or chest.Myth: A lump in your breast means you have breast cancer.

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Fact: Only a small percentage of lumps in the breast are cancerous. A lump can be a non- cancerous fibrous growth as well. Consult a doctor for a clinical breast examination. This examination becomes all the more important for if there is any discharge or change in thesize and/or shape of a lump.

Diagnosis Of Breast Cancer

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Stand topless in front of a mirror with your hands on your sides and shoulders straight.Look at your breasts in the mirror for any visual changes in the breasts such as dimpling, inverted nipple, puckering, and changes in the size, shape or symmetry.Lift your hands and place the palms on the back of the head to look for changes in the breast.Repeat this by lifting one breast at a time.

Feel your breasts by using the pads of your fingers (not the tips). Apply pressure and move your fingers over the breasts in a circular motion just like massaging the area. As you do this, make your way to the collarbone, center of the breastbone and near the armpits.

Inspect your breasts when lying down and again in the shower. The use of water and soap while taking a shower makes it easier for your fingers to glide over the skin and make it easy to feel the breasts.Repeat the procedure by placing one hand over the back of the head and massaging the breast with the other hand. Lastly, gently squeeze the nipple tocheck for any discharge.

2 Clinical breast examination (CBE)

A clinical breast exam is done by a doctor or a nurse. During this exam, the clinician uses his/her hands to feel any lumps, hardness, nipple discharge or any other changes in the breast. It should be done once in six months in women who are at a high risk of breast cancer or at the earliest sign of any abnormality or symptoms of breast cancer. If you observe any abnormality during BSE, it's advised to get a CBE done immediately to investigate further.

3 Blood marker tests

Also known as blood tests for tumor markers, these tests help to detect cancer activity in the body. In addition to being diagnostic tests, these can also help to determine whether the cancerous cells have moved to other areas of the body or to assess how the treatment is working. If you have already recovered from cancer, then these tests canhelp to check if the cancer has come back (recurrence).

4 Targeted therapy

is a treatment in which the drugs are targeted to the cancer's specific genes, proteins, or the environment that contributes to cancer growth and survival. Unlike chemotherapy, this treatment works in a focussed manner & limits the damage to the healthy cells. As tumors might have different targets, your doctor might need to run a few tests to identify the target before initiating the treatment. Some of the common blood markers that yourdoctor might recommend:

5. Immunotherapy

As the name suggests, immunotherapy works by helping the immune system work to fight cancer cells. This therapy uses substances either made naturally by the body or chemically (in the form of medicines) to:

Stop or slow down the growth of cancer cells Prevent the spread of cancer other parts of the bodyAid the

body to kill cancer cells

Some of the approved immunotherapy drugs to treat breast cancer are:

6 Adjuvant Therapy

Adjuvant therapy is also a critical strategy to avoid the risk of metastases with concomitant rapid progression and tumor recurrence activity . The MA5 study showed anthracycline-based drugs were not effective for treatment when BRCA-1 is expressed in TNBC, while other studies show anthracyclines had encouraging results as adjuvant therapeutics The decision whether or not to carry out adjuvant therapy must be evaluated for each patient by means of rigorous analysis of clinical-histopathological staging-conditions and an adequate categorization of genomic and proteomic profile.

Social support and breast cancer:

The incidence of breast cancer is 1-in-9 women over lifespan. There are no accurate statistics on the incidence of the disease in Iran, but studies show that breast cancer is the second prevalent type cancer . Breast cancer is among diseases with severe psychological impact, in which the thoughts of death and mastectomy cause fear and anxiety in the patient. A cancer patient goes through various psychological stages incoping with and diagnosing this disease. The world of a woman with cancer dramatically collapses in the blink of an eye. The patient becomes confused and her small hopes fade away to great disappointments. Nobody can deeply understand her feelings while, she strongly needs support. Studies show that support is a vital and multi-dimensional need that should frequently be provided to clients. Nurses and physicians usually prioritize physical support; whereas, psychological-mental supports are polled as more important than other things by such patients. Researchers in the field have addressed hidden suffering of the afflicted women and analyzed their description of the disease and suffering. They collected different reports of change in life cycle and style, in which various concepts such as transition, transformation, overcoming and exploration of meaning have been defined. The discovered meanings functioned as ways by which the patient obtained the accuracy, truth, balance, and integrity. In a qualitative study, Hamilton et al. used the grounded theory methodology to investigate the attitude of men as husband, life partner, father, and caregivers about the breast cancer and chemotherapy of their partners. They used semi-structured guided interviews, in which two major subjects were identified: Concentration on the partner's illness, caring for her, and paying attention to family to maintain its flow .

Family of 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 . To women, the loss of breast means losing feminine identity. In addition, although chemotherapy is an important cancer treatment method, it dramatically affects the quality of life of patients and impairs their physical, mental, social, and spiritual well-being .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 . Chronic disease of a family member dramatically affects the whole family. In such circumstances, several factors including role change, doubt, losing the sense of control, stepping into an unfamiliar environment, economic issues, etc. lead to family crisis . According to Landmark and Wall, many women wish that their life patterns become normal, the

sameas before...

Home-care For Breast Cancer:

There are certain changes that happen in the breast as you age. But these changes should not be ignored as they could indicate an underlying breast cancer. This is the reason why every woman above 25 years of age or those with a family history of breast cancer are recommended to do a self-breast examination as it could indicate early changes that happen in the breasts.In addition to following your treatment routine such as radiation and chemotherapy, here are a few tips you need to keep in mind.Eat foods rich in antioxidants as they help the body to fight free radical Stay away from processedand oily foods

Relegion of breast cancer:

Religion is a positive framework for grasping hidden meaning in disease. In the mentioned study, faith was considered as a powerful resource that alleviates concern and stress, and brings real comfort, which can be effective in adaptation with and return to the life .

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 years . however, the role of cigarette has not been considered as a cause until recently . Increased incidence of breast cancer parallel with lung cancer in women in recent decades have attracted researchers towards increased rate of female smokers, aiming at finding a similar cause for this ascending trend. It is almost for two decades that researchers have addressed the relationship between breast cancer and cigarette smoking, leading to at least 22 published articles only by the late 80s. Different studies have suggested a weak relationship, lack of relationship, or supportive effect. The emphasis of these articles has been on active cigarette smoking and breast cancer. Investigation into indirect correlation of cigarette smoking with breast cancer has been less undertaken, but has delivered fixed results. Women exposed to cigarette smoke during childhood or married to a cigarette smoker are more prone to breast cancer . In a meta-analysis by Kuder et al. into indirect exposure to cigarette-smoke and the risk of breast cancer, a weak relationship was found; therefore, further studies are required to prove this causal relationship . Results of Reynold et al.'s study on 116,544 women showed increased chance of developing breast cancer in cigarette-smokers, corroborating the role of cigarette in breast cancer etiology

Scope of the problem:

In 2022, there were 2.3 million women diagnosed with breast cancer and 670 000 deaths globally. Breast cancer occurs in every country of the world in women at any age after puberty but with increasing rates in later life. Global estimates reveal striking inequities in the breast cancer burden according the human development. For instance, in countries with a very high Human Development Index (HDI), 1 in 12 women will be diagnosed with breast cancer in their lifetime and 1 in 71 women die of it.

Treatment:

Treatment for breast cancer depends on the subtype of cancer and how much it has spread outside of the breast to lymph nodes (stages II or III) or to other parts of the body(stage IV).

Doctors combine treatments to minimize the chances of the cancer coming back (recurrence). These include:

Surgery to remove the breast tumour

Radiation therapy to reduce recurrence risk in the breast and surrounding tissues

Medications to kill cancer cells and prevent spread, including hormonal therapies, chemotherapy or targeted biological therapies.

Treatments for breast cancer are more effective and are better tolerated when started early and taken to completion.

Surgery may remove just the cancerous tissue (called a lumpectomy) or the whole breast (mastectomy). Surgery may also remove lymph nodes to assess the cancer's ability tospread.

Radiation therapy treats residual microscopic cancers left behind in the breast tissue and/or lymph nodes and minimizes the chances of cancer recurring on the chest wall.

Advanced cancers can erode through the skin to cause open sores (ulceration) but are

not necessarily painful. Women with breast wounds that do not heal should seek medical care to have a biopsy performed.

Medicines to treat breast cancers are selected based on the biological properties of the cancer as determined by special tests (tumour marker determination). The great majority of drugs used for breast cancer are already on the WHO Essential Medicines List(EML).

Lymph nodes are removed at the time of cancer surgery for invasive cancers. Complete removal of the lymph node bed under the arm (complete axillary dissection) in the past was thought to be necessary to prevent the spread of cancer. A smaller lymph node procedure called "sentinel node biopsy" is now preferred as it has fewer complications.

Medical treatments for breast cancers, which may be given before ("neoadjuvant") or after ("adjuvant") surgery, is based on the biological subtyping of the cancers. Certain subtypes of breast cancer are more aggressive than others such as triple negative (those that do not express estrogen receptor (ER), progesterone receptor (PR) or HER-2 receptor). Cancer that express the estrogen receptor (ER) and/or progesterone receptor (PR) are likely to respond to endocrine (hormone) therapies such as tamoxifen or aromatase inhibitors.

NEOADJUVANT THERAPY RATIONALE:

It has been shown in randomized clinical trials that systemic chemotherapy given before or after surgery results in no differences in long-term outcomes among breast cancer patients . The conventional clinical advantages of preoperative or neoadjuvant systemic therapy include tumor down-staging, which can improve surgical outcomes. Preoperative therapy may turn inoperable tumors into operable ones and allows surgical de-escalation in the breast and axilla in patients with early-stage breast cancer. Approximately 40% of patients with HER2-positive and triple-negative tumors initially requiring mastectomy can be converted to breast-conserving surgery (BCS) candidates . Further, neoadjuvant systemic treatment may offer prognostic information based on the extent of treatment response, which can also identify patients with residual disease who may require additional adjuvant therapy. Achieving a pCR after neoadjuvant chemotherapy is predictive of significantly better disease-free survival (DFS) and overall survival (OS) in early breast cancer, and the correlation was most pronounced in triple- negative cancer and HER2-positive disease . This observation has led to studies exploring the use of additional adjuvant therapy agents in patients with residual disease after standard neoadjuvant therapy. In the CREATE-X trial, the addition of capecitabine in the adjuvant setting improved DFS and OS in patients with HER2-negative breast cancer who did not achieve pCR after standard anthracycline and taxanes-containing preoperative therapy..

Methodology:

In this article, required information was collected through literature review and keyword (cancer, breast cancer, cell, gene, life quality, women, prevalence, productivity, age, obesity, alcohol, cigarette, menopause, genetic, Cytokine, and mortality) query in credible scientific websites such as SID, Google Scholar, and comprehensive portal of human sciences.

Breast cancer

prevention involves several strategies, some of which focus on lifestyle changes andothers on medical interventions:

1)Healthy Lifestyle

Diet:Eat a balanced diet rich in fruits, vegetables, whole grains, and lean proteins. Limitalcohol intake and avoid excessive consumption of processed or red meats.

Exercise: Engage in regular physical activity. Aim for at least 150 minutes of moderateexercise or 75 minutes of vigorous exercise per week.

Weight Management: Maintain a healthy weight. Obesity or overweight can increase therisk of breast cancer.

Regular Screening

Mammograms:Follow recommended guidelines for mammograms. Regular screeningcan help detect breast cancer early when it is most treatable.

Clinical Breast Exams: Have regular breast exams by a healthcare provider.

Genetic Testing: If you have a family history of breast cancer or specific genetic mutations (e.g., BRCA1 or BRCA2), discuss genetic testing with your doctor to assess your risk and consider preventive measures.

Medication: For women at high risk, medications like selective estrogen receptor modulators (SERMs) or aromatase inhibitors may reduce the risk of breast cancer.

Surgical Options: In some cases, preventive (prophylactic) mastectomy or oophorectomy (removal of ovaries) may be considered, particularly for those with a veryhigh risk due to genetic factors.

Limit Exposure to Radiation: Avoid unnecessary radiation, as excessive exposure can increase breast cancer risk.

Breastfeed If possible, breastfeeding for several months may reduce the risk of breastCancer

Observations :

Breast cancer is categorized into 3 major subtypes based on the presence or absence of molecular markers for estrogen or progesterone receptors and human epidermal growth factor 2 (ERBB2; formerly HER2): hormone receptor positive/ERBB2 negative (70% of patients), ERBB2 positive (15%-20%), and triple-negative (tumors lacking all 3 standard molecular markers; 15%). More than 90% of breast cancers are not metastatic at the time of diagnosis. For people presenting without metastatic disease, therapeutic goals are tumor eradication and preventing recurrence. Triple-negative breast cancer is more likely to recur than the other 2 subtypes, with 85% 5-year breast cancer–specific survival for stage I triple-negative tumors vs 94% to 99% for hormone receptor positive and ERBB2 positive. Systemic therapy for nonmetastatic breast cancer is determined by subtype: patients with hormone receptor–positive tumors receive endocrine therapy, and a minority receive chemotherapy as well; patients with ERBB2-positive tumors receive ERBB2-targeted antibody or small-molecule inhibitor therapy combined with chemotherapy; and patients with triple-negative tumors receive chemotherapy alone. Local therapy for all patients with nonmetastatic breast cancer consists of surgical resection, with consideration of postoperative radiation if lumpectomy is performed. Increasingly, some systemic therapy is delivered before surgery. Tailoring postoperative treatment based on preoperative treatment response is under investigation. Metastatic breast cancer is treated according to subtype, with goals of prolonging life and palliating symptoms. Median overall survival for metastatic triple-negative breast cancer is approximately 1 year vs approximately 5 years for the other 2 subtypes.

CONCLUSION AND PERSPECTIVE:

In the recent 20 years, we have seen the development of personalized/precision treatment in breast cancer. Current precision treatment strategies are based on molecular subtyping of breast cancer. Future therapeutic concepts will focus more on individualization of therapy for every single patient and escalation and de-escalation of treatment according to tumor biology and early predictive markers. Further classification of the current breast cancer subtypes (e.g., TNBC) combined with subtyping-based umbrella trials may help improve the disease outcome . In addition, developing novel drugs for both early and advanced breast cancer remains an unmet need. The mechanisms underlying drug resistance and ways to overcome it are the main focus of ongoing research. Single-cell technologies will provide insight into tumor- microenvironment interactions and may help to uncover new treatment biomarkers and targets. As an example, a single-cell study found that the level of the CXCL13-positive T cell subset was predictive of responses to anti-PD-L1 therapies in TNBC .

The major trend In breast cancer surgery is de-escalation. Future surgical treatment will focus more on tumor biology, and the treatment plan will be more individualized. In the future, two major questions in breast cancer treatment remain to be answered. Can breast surgery be omitted in patients with a pCR after neoadjuvant therapy And the other, can some patients be completely spared axillary surgery, both for the purpose of stagingand treatment.

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