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Breast Cancer and Women's Health Bridging Prevention, Early Detection, and Unani Therapeutics in Integrative Oncology-A Review article.

Dr. Jameel Ahmad Mohammad Abbas [1]*, Dr. Abdul Rehman Shaikh [2], Dr. Rubeena Lukman Saudagar [3], Arfa S. Ahmed [4], Dr. Mohd. Raunaq Ali [5], Dr. Md. Ashif Akhlaque [6], Mr. Sayyed Mukhim Sayyed Salim [7]

*[1] Professor & HOD, Dept. of Pharmaceutics. Delight College of Pharmacy, Pune. (MH) India

[2] Professor & HOD, Dept. of Ain Uzn Anf Halaque wa Asnan,Yunus Fazlani Medical College and Hospital, Kunjkheda, Chatrapati Sambhaji Nagar (MH) India

[3] Professor & HOD, Dept. of Kulliyat, Yunus Fazlani Medical College and Hospital, Kunjkheda, Chatrapati Sambhaji Nagar (MH) India

[4] Principal, Abdul Majeed Central Education Society Institute of Pharmacy, Lonara. Nagpur (MH) India

[5] PG Scholar, Dept. of Medicine (Moalajat) Jamia Tibbiya Deoband, Dist: Saharanpur (U.P.) India

[6] PG Scholar, Dept. of Medicine (Moalajat) Jamia Tibbiya Deoband, Dist: Saharanpur (U.P.) India

[7] Ph. D Scholar, Dept. of Pharmaceutical Sciences, Maulana Azad University, Jodhpur. (Raj) India

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ABSTRACT

Breast cancer is the most frequently diagnosed cancer among women worldwide and remains a major public health challenge. It is a multifactorial disease influenced by genetic, hormonal, reproductive, lifestyle, and environmental factors. This review provides a comprehensive overview of breast cancer, including its epidemiology, classification, risk factors, clinical manifestations, prevention strategies, and current treatment approaches. Major risk factors such as advancing age, family history, BRCA1/BRCA2 gene mutations, obesity, alcohol consumption, early menarche, late menopause, and physical inactivity are discussed. Protective factors including regular physical activity, breastfeeding, multiparity, and healthy dietary habits are also highlighted. The review further examines conventional management strategies, including surgery, chemotherapy, radiotherapy, hormonal therapy, and targeted therapies. In addition, the potential role of Unani medicine and herbal therapeutics in integrative oncology is explored, with emphasis on medicinal plants such as Curcuma longa (Turmeric), Nigella sativa (Black Seed), Withania somnifera (Ashwagandha), and Camellia sinensis (Green Tea), which exhibit antioxidant, anti-inflammatory, immunomodulatory, and anticancer properties. The importance of early detection, regular screening, lifestyle modification, and multidisciplinary treatment approaches is emphasized. Integrating evidence-based traditional therapies with modern oncology may offer promising opportunities for improving patient outcomes, quality of life, and supportive care in breast cancer management

Keywords: Breast Cancer, Women's Health, Risk Factors, Early Detection, Unani Medicine, Herbal Therapeutics, Integrative Oncology, Prevention, Exercise, BRCA Mutations...

INTRODUCTION

Breast cancer is an abnormal growth of tissue in the breast that can sometimes be felt as a lump. The tumour develops when cells in the breast divide without control and produce extra tissue. It can be benign (non-cancerous) or malignant (cancerous). Cancerous cells can spread within the breast, to lymph nodes (glands) in the armpit, and to other parts of the body. Breast cancer is the most commonly diagnosed female cancer among Singaporean women. Almost 1 in 13 women in Singapore will be diagnosed with breast cancer in their lifetime.

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History of Female Breast Cancer

Period / Year	Milestone / Event	Key Figure(s)	Description / Significance	Impact on Breast Cancer Care
Ancient Egypt (1600 BC)	Earliest documented case	Imhotep (physician of Pharaoh)	The Edwin Smith Papyrus describes a case of a breast tumor, considered the earliest recorded reference to breast cancer.	Shows that breast cancer has been recognized since ancient times.
Ancient Greece (460–370 BC)	Hippocratic writings	Hippocrates	Hippocrates described tumors in the breast and emphasized observation and prognosis.	Early clinical description and the foundation of medical observation.
Roman Era (1st Century AD)	Medical literature reference	Aulus Cornelius Celsus	Celsus described breast tumors and recommended surgical removal when possible.	Early support for surgical intervention in breast tumors.
Middle Ages (5th–15th Century)	Limited medical advancement	–	Breast cancer knowledge declined; disease often attributed to humors or spiritual causes.	Little progress in diagnosis or treatment during this period.
Renaissance (16th Century)	Renewed interest in anatomy	Andreas Vesalius	Improved understanding of human anatomy laid groundwork for future surgical advancements.	Anatomical knowledge improved, supporting better surgical approaches later.
18th Century	Early surgical approaches	John Hunter	Advocated for early removal of breast tumors and studied patterns of spread.	Emphasized early surgery and importance of margins.
19th Century (1867)	First radical mastectomy	William Halsted	Performed the first radical mastectomy (removal of breast, chest muscles, and lymph nodes).	Established aggressive surgical treatment as standard for many years.
20th Century (Early 1900s)	Advances in pathology and diagnosis	George Thomas Beatson	Studied hormonal influence; induced ovarian suppression in advanced cases.	Introduced the role of hormones in breast cancer.
20th Century (1940s–1970s)	Radiation and chemotherapy development	Various researchers	Radiation therapy improved; chemotherapy agents (e.g., methotrexate, cyclophosphamide) introduced.	Expanded non-surgical treatment options and improved survival.
20th Century (1980s–1990s)	Molecular and hormonal discoveries	Researchers worldwide	Discovery of estrogen receptor (ER), HER2/neu, and improved understanding of tumor biology.	Enabled targeted therapy and personalized treatment approaches.
21st Century (2000–Present)	Targeted therapy, immunotherapy & precision medicine	Global scientific community	Development of targeted drugs (e.g., trastuzumab), immunotherapy, genomic profiling, and minimally invasive techniques.	Improved outcomes, personalized care, early detection, and quality of life.

Breast cancer is much more likely to occur in females than males, and it is also highly associated with advancing age and race with White females having the highest overall rates of breast cancer followed by Black, Asian, and Hispanic females respectively. Women with a first-degree relative who have had breast cancer are twice to three times more likely to develop breast cancer in their lifetime . The goal of this chapter is to explore the etiology of breast cancer to help provide a better understanding of the risk factors of this disease to potentially aid further research into the prevention and management of this disease.[1-2]

History of Female Breast Cancer in India

Period / Era	Timeframe	Milestone / Event	Key Figure(s) / Institution(s)	Significance / Impact
Ancient India	Before 1000 AD	References to breast lumps in Ayurvedic texts	Charaka Samhita, Sushruta Samhita	Ancient texts described "arbuda" (tumors), including granthi (lumps) in the breast and advised early intervention and surgery in some cases.
Medieval Period	1000–1700 AD	Limited documentation; traditional healing practices	Vaidyas, Hakims, local healing traditions	Breast lumps treated using herbal medicines, therapies and surgery in select cases; lack of systematic records.
British Colonial Era	1700–1947	Introduction of Western medicine and hospitals	British medical officers, missionary hospitals	Western medical practices introduced; early case reports of breast tumors in Indian women by colonial doctors.
Early 20th Century	1900–1947	Development of surgical services in India	Indian surgeons; hospitals in major cities	Breast cancer surgery started in some urban hospitals; low awareness and late diagnosis were common.
Post-Independence Era	1947–1960s	Growth of cancer care infrastructure	Government of India; Regional Cancer Centers	Establishment of cancer hospitals and departments in major cities; focus on radiotherapy and surgery; data collection began.
1970s–1980s	1970s–1980s	Improved diagnosis and awareness begins	Tata Memorial Hospital (Mumbai), ICMR	Mammography introduced in major centers; population-based cancer registries started; public awareness slowly increasing.
1990s	1990s	Rise in awareness and screening efforts	NGOs, medical societies, government programs	Breast cancer awareness campaigns started; self-breast examination promoted; more women sought medical help.
2000s	2000s	Advances in treatment and multidisciplinary care	AIIMS, TMC, Regional Cancer Centres, private hospitals	Better imaging, breast-conserving surgery, chemotherapy, and hormonal therapy became more accessible.
2010s	2010s	National screening and early detection initiatives	National Programme for Prevention and Control of Cancer, NCDIR	Nationwide awareness campaigns; emphasis on early detection, screening in high-risk women, and training of healthcare workers.
2020s and Beyond	2020s–Present	Precision medicine and patient-centered care	Indian research institutions, startups, oncology networks	Genetic testing, targeted therapies, immunotherapy, and digital health improving outcomes; focus on survivorship and quality of life.

Note: Breast cancer is now the most common cancer among Indian women. Early detection and timely treatment are key to better outcomes.

II. Types of breast cancer

The 2 most common types of breast cancer are:

A. Invasive ductal carcinoma: This occurs when cancer cells grow from within the ducts and invades the surrounding breast tissue. This type accounts for 70 – 80% of breast cancer cases.

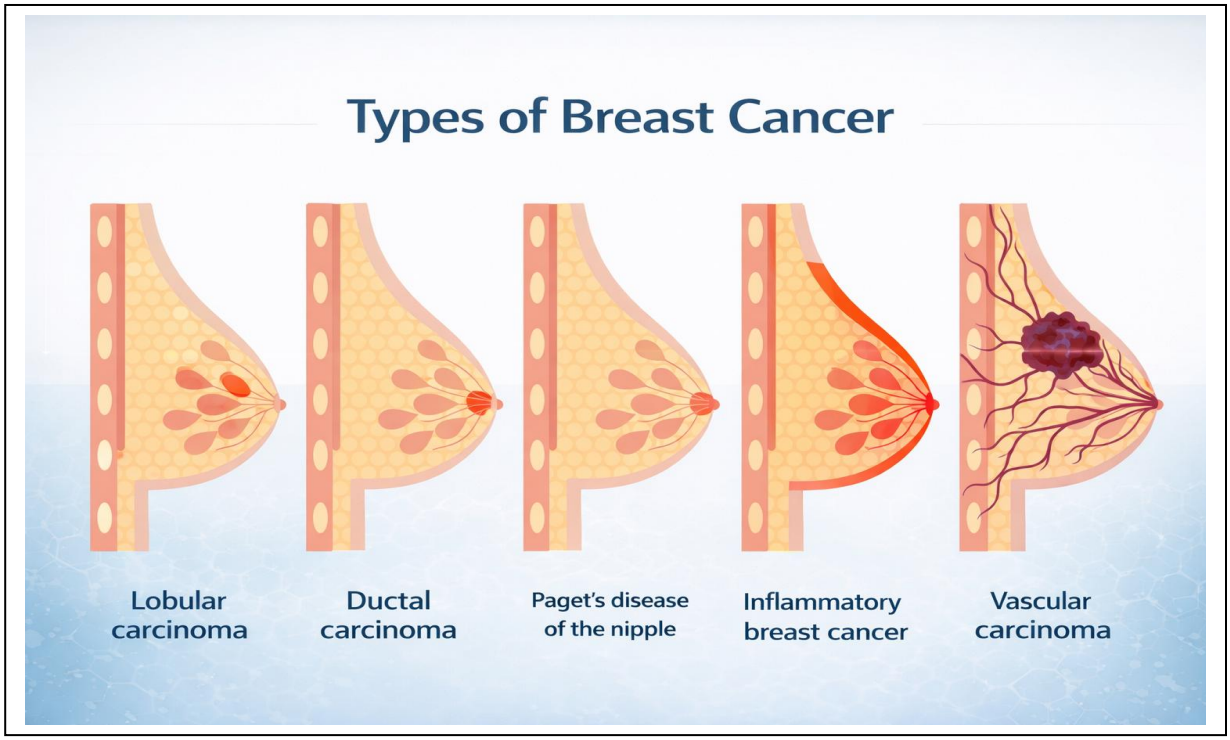
B. Invasive lobular carcinoma: This originates from the breast lobules and invades the surrounding tissue. This type accounts for 10 – 15% of all breast cancer cases.

Other rarer forms of breast cancer include:

Mucinous, papillary and tubular carcinomas, which usually have better prognoses than ductal and lobular cancers.

Paget's disease of the nipple, a condition where breast cancer manifests as changes of the nipple, usually as a rash, and may be mistaken for eczema. An associated breast cancer is typically diagnosed on further imaging of the breast, although the cancer is rarely limited to the nipple.

Inflammatory breast cancer, an uncommon but aggressive form of breast cancer. The breast has a red and swollen appearance, sometimes without the presence of a breast lump. When what appears to be breast infection (mastitis) does not resolve with antibiotic treatment, a biopsy is required to exclude inflammatory breast cancer.



III. Stages of breast cancer

Breast cancer is assessed in 5 stages:

Stage 0: This stage is often referred to as ductal carcinoma in situ (DCIS). During this stage, the cells are still limited to within a duct and have not yet started spreading to surrounding tissues.

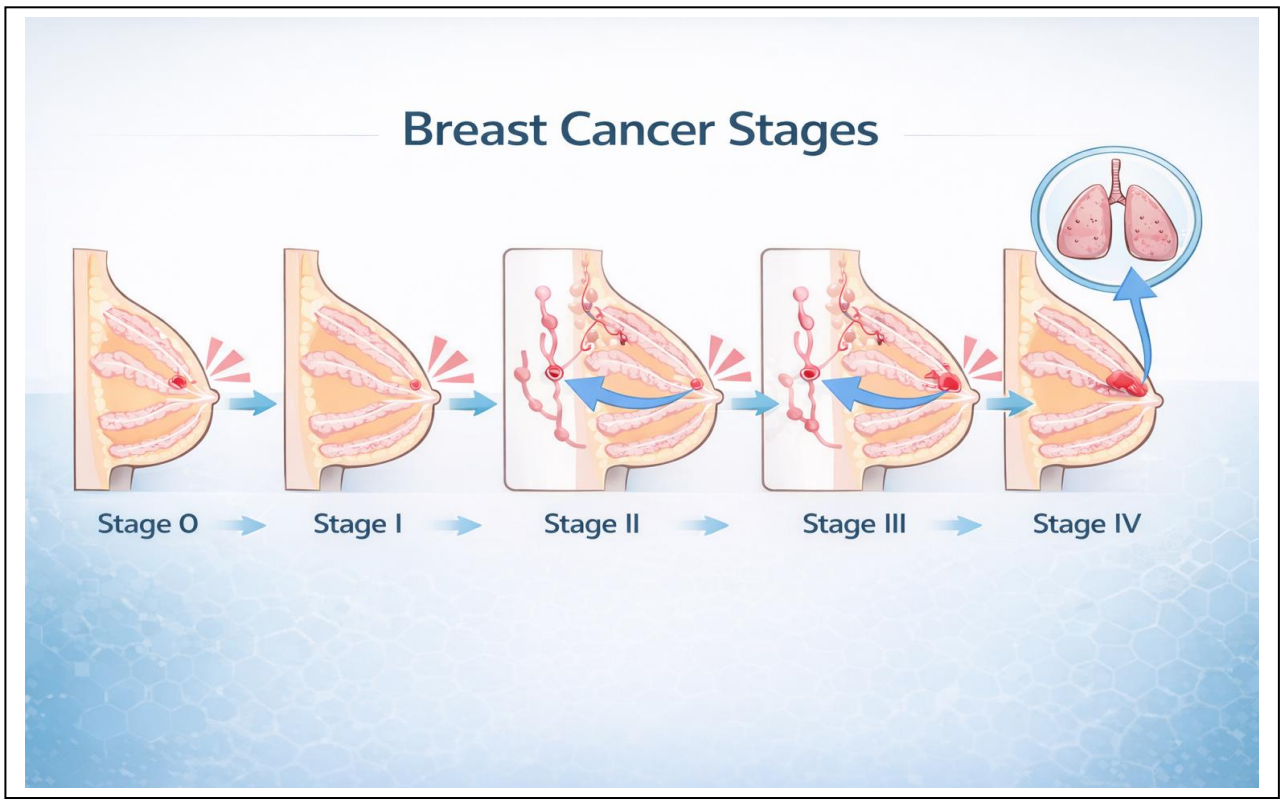
Stage I: At this stage, the tumour is <2cm. However, it has not begun to affect the lymph nodes and other surrounding tissues.

Stage II: The tumour is between 2 – 5cm, and may have started spreading to nearby lymph nodes.

Stage III: The tumour has become >5cm and/or has spread to surrounding lymph nodes and surrounding tissues. It may have also invaded the skin or chest wall.

Stage IV: The cancer has spread to distant body organs such as the brain, liver, and lungs.

Stage 0 and 1 breast cancers have close to 100% relative survival rates at 5 years, while Stage 2 and 3 breast cancers have lower 5-year relative survival rates of 90% and 70% respectively. Stage 4 breast cancer, however, has a relative 5-year survival rate of 23%.



IV. Symptoms of breast cancer

Breast cancer symptoms include:

A painless lump in the breast

Bleeding or unusual discharge from the nipple

Dimpled or puckered skin over the breast

Persistent itch and rash around the nipple

Pulled in or retracted nipple

Swollen and thickened skin over the breast

Learn more about breast lumps and when you should speak to a doctor about them.

causes breast cancer. The cause of breast cancer is unknown and likely due to a combination of genetic, environmental and lifestyle factors. All women, regardless of age and general health condition, are at risk of getting breast cancer. However, the following factors may increase the risk of breast cancer:

Age (women above 40 years)

Menstruating at a younger age (below 12 years)

Having menopause at a later age (above 55 years)

Having a late childbirth

Family history of breast cancer

V. Complications and related diseases of breast cancer

Breast cancer can lead to other diseases and complications. Potential complications include:

Bone resorption or breaking down of bones

Fractures due to weakening of bones

Spinal compression or pressure on the spinal cord and nerves can cause neck or back pain, numbness, tingling sensation, difficulty in walking, and problems in bladder and bowel control

Hypercalcaemia (high level of calcium in the blood) can lead to irregular heartbeat, kidney stones, kidney failure, confusion, dementia or coma

Lung complications that lead to chest discomfort, shortness of breath, wheezing, cough, tumour, pleural effusion or fluid in the lungs

Liver complications that lead to stomach pain, weight loss, vomiting, problems with waste removal, and jaundice

Brain complications that lead to frequent headaches, dizziness, nausea, vomiting and seizures

VI. Complications in breast cancer treatment

In any breast cancer treatment, the normal cells may be affected. Thus, treatments may lead to side effects and complications, such as:

Mouth sores

Nausea

Nerve damage

Diarrhoea

Burning pain and scarring due to radiation therapy

Post-surgery pain

Lymphoedema or swelling

Infection

Hematoma – blood build-up outside the blood vessels

Seroma – fluid build-up underneath the skin

Negative reaction to anaesthesia

Heart disease

Secondary cancers like leukemia and soft tissue sarcoma

VII. Prevention breast cancer.

While there is no certain way to prevent breast cancer, maintaining some healthy habits can help lower your risk. Here are some of them:

Maintain a healthy weight

Engage regularly in physical activities

Limit or avoid alcohol

Breastfeed

Perform monthly breast self-examinations and go for regular breast screening

In case an increased risk of breast cancer, paitient may also wish to consider:

Undergoing genetic counselling and testing

Taking hormonal therapy to lower your breast cancer risk

Preventive surgery (for women with very high risk)

VIII. Factor affecting on Breast cancer.

A. Gender: Breast cancer occurs far more frequently in women than in men, with approximately 280,000 women and 3,000 men diagnosed annually in the United States. The higher incidence in women is largely attributed to greater lifetime exposure to the hormones estrogen and progesterone, which stimulate breast tissue growth and can promote cancer development. Elevated levels of circulating estrogens and androgens, particularly in postmenopausal women, are associated with an increased risk of breast cancer. In men, an increased estrogen-to-androgen ratio resulting from hormonal imbalances can also raise breast cancer risk. Additionally, women experience significant hormonal fluctuations throughout life due to menstruation, pregnancy, and menopause, leading to greater cumulative hormonal exposure compared with men. These hormonal influences play a crucial role in the development, progression, and management of breast cancer. [3-6]

B. Age: Age is one of the most significant risk factors for breast cancer. Most breast cancer cases are diagnosed in women over the age of 50, and the risk increases progressively with advancing age. According to data from the Surveillance, Epidemiology, and End Results (SEER) program, the probability of developing breast cancer rises from approximately 2.4% among women aged 50–59 years to 3.5% among those aged 60–69 years, and reaches 7.0% in women aged 70 years and older. This age-related increase is attributed to the accumulation of genetic mutations, cellular damage, and prolonged exposure to carcinogenic factors over time. Age also influences prognosis, as women diagnosed before the age of 50 generally have lower survival rates compared with those diagnosed between 50 and 70 years of age. The poorer outcomes observed in younger women are largely associated with a higher prevalence of aggressive tumor subtypes, particularly triple-negative breast cancer, which tends to occur more frequently in women aged 40 years or younger. [7-11]

C. Heritable factors and cancer genetics: A personal history of breast cancer is associated with an increased risk of developing cancer in the opposite (contralateral) breast. Breast cancer survivors experience an estimated annual increase of approximately 0.5% in the risk of developing a second breast cancer after their initial diagnosis. However, much of this increased risk may be related to advancing age rather than the previous cancer itself. Family history is a well-established risk factor for breast cancer. Women with a first-degree relative (mother, sister, or daughter) who has had breast cancer have approximately twice the risk of developing the disease compared with women without a family history. The risk increases further when multiple first-degree relatives are affected; women with two first-degree relatives diagnosed with breast cancer have nearly three times the risk. Even second-degree relatives (grandmothers, aunts, and nieces) with breast cancer contribute

to an elevated risk, increasing it by approximately 20–30%. The association between family history and breast cancer is largely explained by inherited genetic mutations, particularly in the **BRCA1** and **BRCA2** genes. These genes normally function as tumor suppressors, helping to repair damaged DNA and prevent uncontrolled cell growth. Women carrying pathogenic variants of **BRCA1** or **BRCA2** face a substantially higher lifetime risk of breast cancer. Studies estimate the cumulative lifetime risk to be approximately **72% for BRCA1 mutation carriers** and **69% for BRCA2 mutation carriers**. Additionally, breast cancer tends to develop at younger ages in mutation carriers, with incidence increasing from around age 35 years in BRCA1 carriers and around age 45 years in BRCA2 carriers. Overall, BRCA1 mutation carriers have a slightly higher breast cancer risk than BRCA2 mutation carriers. [12-18]

D. Geography, ethnicity and race: Breast cancer incidence varies worldwide, with higher rates reported in North America, Europe, Australia, and New Zealand. In the United States, White women have the highest overall breast cancer incidence, followed by Black women. However, Black women are more likely to develop breast cancer before age 45, present with advanced disease, and experience higher mortality rates. Lower incidence rates are observed among Asian/Pacific Islander, Hispanic, and American Indian/Alaska Native women. These differences are influenced by genetic, biological, socioeconomic, and healthcare-related factors. [19-22]

E. Obesity: Obesity is an important risk factor for breast cancer, particularly in postmenopausal women. A higher Body Mass Index (BMI ≥30 kg/m²) is associated with an increased risk of estrogen receptor-positive breast cancer, mainly due to higher estrogen production from adipose tissue. Studies show that breast cancer risk increases with increasing BMI in postmenopausal women. In contrast, a higher BMI in premenopausal women has been associated with a lower risk of breast cancer, although the exact reason for this protective effect remains unclear. Overall, obesity plays a significant role in breast cancer development, especially after menopause. [23-30]

F. Stature: Tall stature has been identified as an independent risk factor for breast cancer. Studies have shown that women who are 1.75 meters (69 inches) or taller have a higher risk of developing breast cancer compared with women shorter than 1.60 meters (63 inches). This increased risk is observed in both premenopausal and postmenopausal women. Although the exact mechanism remains unclear, factors such as genetics, childhood nutrition, environmental influences, and growth hormone exposure during early life may contribute to the association between greater height and increased breast cancer risk. [31-32]

G. Physical activity and nutrition

Regular physical activity is associated with a reduced risk of breast cancer in both women with and without a family history of the disease. Exercise may lower breast cancer risk by helping maintain a healthy body weight and reducing estrogen and insulin levels. Since obesity is a major risk factor for postmenopausal breast cancer, physical activity plays an important protective role. Dietary habits may also influence breast cancer risk. Studies suggest that diets rich in fruits, vegetables, and fiber are associated with a lower risk of breast cancer and improved survival, whereas high consumption of red meat, processed foods, and fatty foods may increase risk. However, findings regarding the impact of specific dietary factors remain inconsistent, and further research is needed to establish definitive conclusions. [33-40]

H. Alcohol consumption and smoking: Alcohol consumption is associated with an increased risk of breast cancer, even at low to moderate levels of intake. Studies have shown that women who consume alcohol regularly have a slightly higher risk of developing breast cancer compared with non-drinkers, and the risk increases with greater lifetime alcohol consumption. This association is thought to result from alcohol's effects on hormone metabolism, particularly its ability to increase circulating estrogen levels, which can promote breast cancer development. Therefore, limiting alcohol intake may help reduce breast cancer risk. [41-43]

I. Menarche and menopause: Early menarche (onset of menstruation) and late menopause are associated with an increased risk of breast cancer. Women who begin menstruating at a younger age or experience menopause later in life have a longer lifetime exposure to endogenous estrogen, which can promote breast cancer development. Studies indicate that the risk increase is more pronounced with early menarche than with late menopause, suggesting that factors beyond the duration of estrogen exposure may contribute to breast cancer risk. Further research is needed to better understand the underlying mechanisms of this association. [43]

J. Reproductive history and breastfeeding: Multiple studies have demonstrated that multiparity (having multiple childbirths) **and** breastfeeding provide protection against breast cancer. Breastfeeding for at least six months appears to offer the greatest protective benefit. Research shows that breast cancer risk decreases with both increasing number of births

and longer duration of breastfeeding. On average, the risk of breast cancer is reduced by approximately 7% for each child-birth **and** 4.3% for every year of breastfeeding. This protective effect is particularly notable for receptor-negative breast cancers, which are often more aggressive forms of the disease. [43].

IX. Treatment / Management

Breast cancer treatment is nuanced and based on various factors, including the disease stage, pathology, patient preference, and available resources. In general, breast cancer management approaches are divided into early breast cancer, locally advanced breast cancer, and metastatic breast cancer treatment.

A. Early Breast Cancer

Early breast cancer includes tumors <5 cm in size without clinically positive lymph nodes. Treatment involves surgery, chemotherapy, radiation, and hormonal therapy, depending on the stage and molecular profile. The modalities used include:

Surgical treatment: Options to excise the primary tumor include breast conservation surgery (eg, partial mastectomy or lumpectomy) or a total mastectomy.

Axillary lymph node management: Sentinel lymph node biopsy is performed during the operation. Without extranodal extension, no further axillary surgery is required if 2 to 3 axillary lymph nodes are microscopically positive. A completion axillary dissection or axillary radiation is indicated in patients with >3 positive lymph nodes or extranodal extension.

Chemotherapy: Systemic chemotherapy is indicated based on the final stage and the tumor's molecular profile.

In hormone receptor-positive tumors, the decision to initiate chemotherapy is based on risk stratification using genomic analysis of the primary using commercially available kits (eg, Oncotype Dx). High-risk patients benefit from chemotherapy in addition to hormonal therapy.

All HER2-positive patients with tumors >1 cm should receive anti-HER2-directed therapy.

All triple-negative patients with tumors > 1 cm should receive systemic chemotherapy.

Radiation: Patients undergoing breast conservation surgery (BCS) must receive radiation to the breast with a boost to the tumor bed to reduce local recurrence. Patients who undergo mastectomy do not need breast radiation, except in certain circumstances (eg, >5 cm tumor, chest wall invasion, skin involvement, multifocal tumour, ≥4 positive nodes).

Hormonal therapy: Anti-estrogen or aromatase inhibitor therapy is indicated in all hormone receptor-positive patients.

Up-front chemotherapy (ie, neoadjuvant therapy) has been increasingly used in early-stage triple-negative and HER2-positive tumors. Delivering the chemotherapy up-front has several advantages, including allowing response assessment, a greater likelihood of completing chemotherapy, and an increased likelihood of breast conservation therapy; therefore, clinicians will likely use this strategy more extensively.

Treatment of Female Breast Cancer

Treatment Type	Examples	Purpose
Surgery	Lumpectomy, Mastectomy	Removes the tumor and affected breast tissue.
Radiation Therapy	External Beam Radiation	Destroys remaining cancer cells after surgery.
Chemotherapy	Doxorubicin, Cyclophosphamide, Paclitaxel	Kills cancer cells throughout the body.
Hormone Therapy	Tamoxifen, Letrozole, Anastrozole	Blocks hormones that promote cancer growth in hormone receptor-positive tumors.
Targeted Therapy	Trastuzumab, Pertuzumab	Targets specific cancer proteins such as HER2.
Immunotherapy	Pembrolizumab	Helps the immune system attack cancer cells.
Palliative/Supportive Care	Pain management, Nutritional support, Counseling	Improves quality of life and relieves symptoms.

Stage-wise Treatment

Stage	Common Treatment
Stage 0	Surgery ± Radiation Therapy
Stage I	Surgery + Radiation ± Hormone Therapy
Stage II	Surgery + Chemotherapy/Radiation ± Hormone Therapy
Stage III	Chemotherapy + Surgery + Radiation Therapy
Stage IV	Targeted Therapy, Hormone Therapy, Chemotherapy, Immunotherapy, Palliative Care

B. Locally Advanced Breast Cancer (LABC)

Locally advanced breast cancer (LABC) primarily consists of tumors larger than 5 cm or those with clinically positive lymph nodes. Most patients with LABC will receive some form of neo-adjuvant therapy, with adjunct surgery and radiation therapy. Patients with LABC typically undergo a breast MRI at baseline. The primary tumor and the involved lymph nodes must have radio-graphically detectable markers placed before initiation of chemotherapy, as tumors can shrink and disappear after therapy. [30]

Chemotherapy regimens vary based on the tumor pathology (eg, hormone receptor-positive, HER2-positive, or triple-negative), the patient's age and physical status, and locally available resources. The goals of upfront chemotherapy are to reduce the size of the primary, eradicate micrometastatic disease, and assess disease biology based on the responsiveness of the tumor to chemotherapy. After completion of the chemotherapy regimen, breast and axillary imaging are repeated to assess response to chemotherapy and determine further management, including:

Surgical treatment: Options to excise the primary tumor include BCS or a total mastectomy. Contraindications to BCS include large tumors, chest wall or skin involvement, multifocal disease, inability to receive radiation, and large tumor size to breast size ratio.

Axillary lymph node management: In patients with a clinically positive axilla at diagnosis, an axillary dissection is always performed, regardless of the response of the tumor to neoadjuvant chemotherapy. In patients with a clinically negative axilla, sentinel lymph node biopsy is performed at the time of surgery. At least 3 lymph nodes should be harvested using a dual-tracer technique. Patients with residual disease should undergo a completion axillary dissection or axillary radiation.

Systemic chemotherapy: Patients with residual disease after systemic chemotherapy may benefit from additional chemotherapy based on the molecular characteristics.

Radiation therapy: The indications for radiation are similar to BCS.

Hormonal therapy: Anti-estrogen or aromatase inhibitor therapy is indicated in all hormone receptor-positive patients

X. **Herbal Drugs Used in Breast Cancer: Mechanisms and Therapeutic Potential**

Herbal Drug	Botanical Name	Active Constituents	Mechanism of Action	Potential Benefits in Breast Cancer
Turmeric	*Curcuma longa*	Curcumin	Inhibits NF-κB, COX-2, and inflammatory pathways; induces apoptosis	Anticancer, anti-inflammatory, anti-metastatic
Green Tea	*Camellia sinensis*	EGCG, Catechins	Suppresses tumor growth and angiogenesis	Reduces cancer cell proliferation
Ashwagandha	*Withania somnifera*	Withaferin A, Withanolides	Induces apoptosis and inhibits metastasis	Antitumor and immunomodulatory effects

Herbal Drug	Botanical Name	Active Constituents	Mechanism of Action	Potential Benefits in Breast Cancer
Black Seed	*Nigella sativa*	Thymoquinone	Antioxidant, anti-inflammatory, apoptosis induction	May inhibit breast cancer cell growth
Garlic	*Allium sativum*	Allicin, Sulfur compounds	Enhances detoxification enzymes and immune response	Protective against cancer progression
Ginseng	*Panax ginseng*	Ginsenosides	Regulates cell cycle and apoptosis	Supports immune function and inhibits tumor growth
Flaxseed	*Linum usitatissimum*	Lignans, Omega-3 fatty acids	Modulates estrogen metabolism	Beneficial in hormone-dependent breast cancer
Aloe vera	*Aloe barbadensis*	Aloe-emodin, Aloin	Antioxidant and antiproliferative activity	May reduce cancer cell viability
Milk Thistle	*Silybum marianum*	Silymarin	Antioxidant and hepatoprotective effects	Supports patients during chemotherapy
Ginger	*Zingiber officinale*	Gingerols, Shogaols	Anti-inflammatory and antioxidant actions	Helps reduce chemotherapy-induced nausea
Boswellia	*Boswellia serrata*	Boswellic acids	Inhibits inflammatory mediators	May reduce tumor-associated inflammation
Holy Basil	*Ocimum sanctum*	Eugenol, Ursolic acid	Antioxidant and immune-enhancing properties	Potential chemopreventive effects

XI. Role of Exercise in Breast Cancer Prevention and Management

Regular physical activity is one of the most effective lifestyle measures for reducing breast cancer risk and improving outcomes among breast cancer patients and survivors. Numerous epidemiological studies have demonstrated that women who engage in regular exercise have a lower risk of developing breast cancer compared with sedentary women. Exercise helps maintain a healthy body weight, reduces body fat, and regulates hormone levels, particularly estrogen and insulin, which are known to influence breast cancer development. Physical activity also enhances immune function, reduces chronic inflammation, and improves overall metabolic health, thereby contributing to cancer prevention.

Benefits of Exercise in Breast Cancer

Benefit	Effect on Breast Cancer
Weight Management	Reduces obesity-related breast cancer risk

Benefit	Effect on Breast Cancer
Hormonal Regulation	Lowers circulating estrogen and insulin levels
Immune Enhancement	Improves body's defense against cancer cells
Reduced Inflammation	Decreases chronic inflammatory processes
Better Quality of Life	Improves physical and mental well-being
Reduced Fatigue	Helps manage cancer-related fatigue
Improved Survival	Associated with better prognosis and lower recurrence rates

Recommended Physical Activities

Type of Exercise	Examples	Recommended Duration
Aerobic Exercise	Walking, jogging, cycling, swimming	150–300 min/week
Strength Training	Weight lifting, resistance bands	2–3 sessions/week
Flexibility Exercise	Stretching, yoga	2–3 sessions/week
Mind–Body Exercise	Yoga, Tai Chi	Regular practice

CONSLUSION:

Breast cancer remains one of the most prevalent and significant health challenges affecting women worldwide. Its development is influenced by a complex interplay of genetic, hormonal, reproductive, lifestyle, and environmental factors. Early detection through regular screening, breast self-examination, and increased public awareness plays a crucial role in improving survival rates and treatment outcomes. Advances in modern medicine, including surgery, chemotherapy, radiotherapy, hormonal therapy, and targeted therapies, have substantially enhanced the management of breast cancer. In addition, growing evidence supports the role of lifestyle modifications such as regular physical activity, maintaining a healthy weight, balanced nutrition, limiting alcohol consumption, and breastfeeding in reducing breast cancer risk. The integration of evidence-based Unani medicine and herbal therapeutics, including medicinal plants such as *Curcuma longa*, *Nigella sativa*, *Withania somnifera*, and *Camellia sinensis*, offers promising supportive approaches due to their antioxidant, anti-inflammatory, immunomodulatory, and potential anticancer properties.

A multidisciplinary and patient-centered approach that combines preventive strategies, early diagnosis, conventional treatment modalities, and complementary traditional therapies may contribute to improved clinical outcomes and quality of life for breast cancer patients. Future research should focus on strengthening the scientific evidence for integrative oncology practices and developing personalized treatment strategies to further enhance breast cancer prevention and management...

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