



Mini Review

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# Approaches Used in Breast Cancer Treatment



**Rana Khalid Iqbal\*, Rehana and Muhammad Umar Farooq**

*Institute of Molecular Biology and Biotechnology, Bahauddin Zakariya University, Pakistan*

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**\*Corresponding author:** Rana Khalid Iqbal, Institute of Molecular Biology and Biotechnology, Bahauddin Zakariya University, Pakistan

## Abstract

Cancer (BC) is a very common tumor in women. It is classified main molecular subtypes according to hormone and growth factors expression. over a few years before, considerable advancements have been made in the finding of new medicines for treating Breast cancer. Improved understanding of the biologic heterogeneity of Breast cancer has allowed the development of an extra effective and individualized method for treatment. In this review, we provide an update of various developing novel therapies like hormonal therapy, Immunotherapy, surgery, chemotherapy, and radiation therapy for breast cancer (BC) treatment.

**Keywords:** Therapy; Surgery; Radiation; Risk; Women; Cancer; Aromatase

**Abbreviation:** BC: Breast cancer; CPM: Contralateral prophylactic mastectomy; ALS: Aromatase inhibitors; PR: Progesterone receptor; PHD-1: Programmed cell death 1 receptor; TNBC: Triple-negative breast cancer; SNLD: Sentinel lymph node; ALND: Axillary lymph node diseases

## Introduction

Breast cancer is the primary causes of cancer in women nearly 1.38 million new cause every year worldwide [1,2]. Breast cancer is the second major foremost causes of cancerous death among women. The most common types are ductal carcinoma in situ, invasive ductal carcinoma, and invasive lobular carcinoma and others include Paget's disease of the nipple that causes 1-4% of breast cancer. BC is a frequently occurring tumor in females and primary result in humanity from cancer in women. About 1.15 million new breast cancer cases in 2002 [3].

Approximately 5% of metastatic breast cancer in a patient with a Germline BRCA mutation [4]. Common risk features for Breast cancer such as a family history of the disease such as menarche and late age menopause, late age at first childbirth and use of alcohol. In contrast, physical inactivity is an adaptable risk factor that has been connected with increased risk of Breast cancer [5-8]. Mammography is helpful for screening and reduces breast cancer-specific mortality [9,10]. Breast cancer is diagnosed through either screening or a sign (e.g pain or palpable mass) that support a diagnostic test [9,11]. Breast cancer develops metastatic, skeletal participation is very common, with informed rates between 47-80% in "autopsy" and 69-80% when defined radiographically [12,13]. Over past years, Antiestrogen Tamoxifen has been the most commonly used treatment for a patient with ER+ Breast cancer and nearly 40% of patient reception adjuvant tamoxifen finally relapse.

## Treatment of Breast Cancer

### Hormonal therapy (endocrine therapy)

Hormonal therapy for breast cancer was described in the early clinical studies of the Scottish surgeon, Beatson (1898). Beaton presented more than 100 years previously as the first effective endocrine management for progressive breast cancer. After several years of discovery of steroid hormones, the possible for non-surgical interference with chemical endocrine set began [14]. Endocrine therapy for advanced breast cancer as first-line therapy for a patient who have ER+ or progesterone receptor (PR)-positive metastatic breast cancer. Tamoxifen and Aromatase inhibitors (Als) are regularly used endocrine therapy. while tamoxifen has a satisfactory therapeutic profile there are associated risks [15].

The MBS method is described in detail elsewhere, and will be summarized briefly [16-19]. This treatment methodically interferes with the action of estrogen in the body and brain, with possible neurocognitive dysfunction [17,18]. Endocrine therapy broadly used in the adjuvant treatment of patients with breast cancer to decrease diseases recurrence and improve survival, with recommending treatment of lasting few years [20].

Aromatase inhibitors, letrozole, exemestane, and anastrozole are the group of drugs used both early-stage and cancer grow in response to hormone estrogen treatment. In the experimental

test that in postmenopausal women have established an insignificant helpful in containing AI primarily or completed course of treatment rather than 5 years of tamoxifen alone [21]. Anastrozole and letrozole are anti-inflammatory drugs derived from antimycotic medication and these factors interconnect Anastrozole and reversible with the cytochrome P450 moiety of aromatase [22]. today endocrine therapy plays an important role in ER-positive breast cancer and can be used alone in addition to chemotherapy, which causes toxicity. Endocrine therapy in premenopausal women can be used to treatment of ER-positive breast cancer where their use is usually combined with drugs such as goserelin (Zoladex) to suppress ovarian estrogen production.

### Immunotherapy

Based on the findings of William Coley, as well as investigators, different approaches for cancer immunotherapy have been proposed, trying to combine improving the immune response against tumors. These therapeutic approaches can be divided into two groups: active and passive immunotherapy, based on how the patient's immune system is involved. Active immunotherapy is designed to stimulate the host's immune system, to generate endogenous defense response against cancer cells [23]. The idea of cancer immunotherapy basically refers to the challenge of applying and stimulate natural immune response, to combine external therapy (chemo-/radiotherapy/surgery) with the internal defense and control machinery at hand, thereby maximizing treatment competence [24]. Monoclonal antibodies (Mab) are deployed in passive cancer immunotherapy specific binding molecules to tumor anti-gens over expressed on the surface of cancer cells [25]. Mab can be targeted against the tumor micro-environment or even directly to immune cells [26]. Cytokines are immunomodulating agents secreted by immune cells as well as endothelial cells, diverse stromal cells and fibroblasts and can mediate paracrine, endocrine or autocrine signaling [27]. The ability of cytokines immune effector cells, increase cancer cell recognition and activation of cytotoxic cells at the cancer location makes them talented agents for cancer therapy [28]. on other hand most effective immunotherapeutic strategies, such as targeting of checkpoint molecules, induce so called immune-related adverse events in 60%-75% of patients [28].

### Surgery

Breast conservation surgery (BCS) was founded by Fischer et al. [29] and Veronesi et al. [9], who described that survival with lumpectomy and radiation was equal to that mastectomy in the cure of early breast cancer. Surgical treatment and radiation therapy including armpit lumps can cause lymphatic edema. The retention of lymph fluid produces a stern inflammation of the arm. it affects nearly 20% of women who suffer ALND and 6% of patient who accept SLNB. There are many ways of therapies for lymphatic edema, and some suggestion shows that and physical

therapy and upper body exercise may decrease the danger and lower the harshness of that state [30].

### Chemotherapy

Taxanes in primary 1990s paclitaxel were recognized as an agent with important action compared to MBC with impartial retort ratio in additional of 50% [31]. Taxanes are significant medicines in the treatment of breast cancer (BC). Improvement of these agents is categorized by a quick assembly of an unparalleled quantity of information from recurrent bulky, high-value potential random task trial that contains ten thousand of the patient [32]. Usage of cytotoxic chemotherapy in both advanced and first-stage breast cancer have made suggesting growth in the previous ten years with many revolutionary revisions classifying strong existence aids for fresher therapies. this development, the best method for any definite patient cannot be strongminded from the review of a work [33]. Anthracyclines have important activity in chemo-naive patients or those who received them in the adjuvant therapy more than 12 months before. Respond rates of 30-40% have been known in patients with MBC [31]. Recent clinical results showed that both chemotherapy and endocrine therapy recover existence in early breast cancer [34]. Polychemotherapy, using an anthracycline-containing treatment, is the most important basis of handling for women absent pre-existing heart disease who prerequisite adjuvant chemotherapy for breast cancer [33].

### Radiation Therapy

Radiation therapy is types of cancer treatment that uses beams of intense energy to kill cancer cells. conventionally, outside ray radiation therapy is directed five days per week over five to seven weeks, but then choose patients a three-week course look to be as active [35]. Breast cancer is nearly tracked radiotherapy to the Breast because such process decreases the risk of cancer reappearance by approximately 50% at ten years and risk of breast cancer death by almost 20% at fifteen years [36]. Clinical trials have developed equal existence for the greater number of patients through the stage I or II breast cancer who have BCS tracked by radiotherapy or mastectomy [37-40]. Furthermore, as compared to BCS plus radiation the risk of complication is closely double as in height for women who suffer mastectomy with rebuilding [41]. Receiving of Radiotherapy after BCS has been found to be connected with patients and race, geography "operating" surgeon, and persevering from radiotherapy amenities [42-45]. The current report exposed that radiotherapy source to important medical aids, by a general 16% total reduction (19%vs 35%) in the risk of breast cancer reappearance and a 14% decline (21%vs 25%, $p<0.0001$ ) in danger of dying from breast cancer [34].

### Conclusion

The handling of breast cancer is a poster teen-ager of in what way the integrative organization can improve the result of

an oncogenic disease. National Vital statistic evidence and the SEER record, Smith et al. could display that from 1990 - 2007, the breast cancer decease rate reduced about 2% per year [46]. At the current chance of developing breast cancer over a lifecycle is 12% (1-in-8) in united states [47]. The elementary goal to recover treatment value may include different methods and aim conditional on the exact risk-organization of disease. We can hope these overhead approaches have the capacity to decrease the chance of expansion of breast cancer in women the next few years.

## References

1. Viridi G (2017) Reconstructive Breast Surgery following Mastectomy for Breast Cancer : A Review. *Journal of Advanced Surgical Research* 2(1): 10-14.
2. Maddams J, Utley M, Møller H (2012) Projections of cancer prevalence in the United Kingdom, 2010-2040. *Br J Cancer* 107(7): 1195-1202.
3. Zhao Z, Wu F (2010) Minimally-invasive thermal ablation of early-stage breast cancer : A systemic review. *Eur J Surg Oncol* 36(12): 1149-1155.
4. Kurian AW, Gong GD, John EM, Miron A, Felberg A, et al. (2010) NIH Public Access. 18(4): 1084-1091.
5. Monninkhof EM, Elias SG, Vlems FA, van der Tweel I, Schuit AJ, et al. (2007) Physical Activity and Breast Cancer A Systematic Review. *Epidemiology* 18(1): 137-157.
6. Friedenreich CM (2001) Physical Activity and Cancer Prevention : From Observational to Intervention Research. *Cancer Epidemiol Biomarkers Prev* 10(4): 287-301.
7. Fuemmeler BF, Pendzich MK, Tercyak KP (2014) Weight, Dietary Behavior, and Physical Activity in Childhood and Adolescence : Implications for Adult cancer risk. *Obes Facts* 2(3): 179-186.
8. Abrahamson PE, Gammon MD, Lund MJ, Britton JA, Marshall SW, et al. (2006) Recreational Physical Activity and Survival Among Young Women with Breast Cancer. *Cancer* 107(8): 1777-1785.
9. Mcdonald ES, Clark AS, Tchou J, Zhang P, Freedman GM, et al. (2016) Clinical Diagnosis and Management of Breast Cancer. *J Nucl Med* 57(Suppl 1): 9S-16S.
10. Pace LE, Keating NL (2015) A Systematic Assessment of Benefits and Risks to Guide Breast Cancer Screening Decisions. *JAMA* 311(13): 1327-1335.
11. Fuller MS, Lee CI, Elmore JG (2016) Breast Cancer Screening: An Evidence-Based Update. *Med Clin North Am* 99(3): 451-468.
12. Maldaun MVC, Mccutcheon ÆIE, Nader ÆR, Theriault R, Rhines ÆLD, et al. (2007) Positive and negative prognostic variables for patients undergoing spine surgery for metastatic breast disease. *Eur Spine J* 16(10): 1659-1667.
13. Collignon J, Lousberg L, Schroeder H, Jerusalem G (2016) Triple-negative breast cancer : treatment challenges and solutions. *Breast Cancer (Dove Med Press)* 8: 93-107.
14. Weinberg OK, Marquez-garban DC, Pietras RJ (2005) New approaches to reverse resistance to hormonal therapy in human breast cancer. *Drug Resist Updat* 8(4): 219-233.
15. Hussain SA, Palmer DH, Moon S, Rea DW, Hussain SA, et al. (2015) Expert Review of Anticancer Therapy for metastatic breast cancer Endocrine therapy and other targeted therapies for metastatic breast cancer. p. 7140.
16. Ganz PA, Kwan L, Castellon SA, Oppenheim A, Bower JE, et al. (2013) Cognitive Complaints After Breast Cancer Treatments : Examining the Relationship with Neuropsychological Test Performance. *J Natl Cancer Inst* 105(11): 791-801.
17. Dyk KV, Crespi CM, Bower JE, Castellon SA, Petersen L, et al. (2019) The Cognitive Effects of Endocrine Therapy in Survivors of Breast Cancer : A Prospective Longitudinal Study up to 6 Years After Treatment. *Cancer* 125(5): 681-689.
18. Ganz PA, Petersen L, Castellon SA, Bower JE, Silverman DHS, et al. (2014) Cognitive Function After the Initiation of Adjuvant Endocrine Therapy in Early-Stage Breast Cancer : An Observational Cohort Study. *J Clin Oncol* 32(31): 3559-3567.
19. Ganz PA, Petersen L, Bower JE, Crespi CM (2016) Impact of Adjuvant Endocrine Therapy on Quality of Life and Symptoms : Observational Data Over 12 Months from the Mind-Body Study. *J Clin Oncol* 38(4): 816-824.
20. Medical C, Accreditation E, Nursing C, Accreditation E (2016) American Cancer Society / American Society of Clinical Oncology Breast Cancer Survivorship Care Guideline. *CA Cancer J Clin* 66(1): 43-73.
21. Shi R, Yu H, McLarty J, Glass J (2004) Igf-i and breast cancer: a meta-analysis. *Int J Cancer* 111(3): 418-423.
22. Susana MC (2004) Aromatase Inhibitors for Breast Cancer in Postmenopausal Women. *The Oncologist* 24(5): 126-136.
23. Ernst B, Anderson KS (2015) Immunotherapy for the Treatment of Breast Cancer. *Curr Oncol Rep* 17(2): 5.
24. Karakhanova S, Link J, Heinrich M, Shevchenko I, Yang Y, et al. (2015) Characterization of myeloid leukocytes and soluble mediators in pancreatic cancer : Importance of myeloid-derived suppressor cells. *Oncolmmunology* 4(4): 37-41.
25. Weiner LM, Dhodapkar MV, Ferrone S (2009) Monoclonal antibodies for cancer immunotherapy. *Lancet* 373(9668): 1033-1340.
26. Weiner LM, Surana R, Wang S (2010) oId Monoclonal antibodies : versatile platforms for cancer immunotherapy. *Nat Publ Gr* 10(5): 317-327.
27. Dinarello CA (2007) Historical insights into cytokines. *Eur J Immunol* 37(Suppl 1): 34-45.
28. Rusch T, Bayry J, Werner J, Shevchenko I, Bazhin AV, et al. (2018) Immunotherapy as an Option for Cancer Treatment. *Arch Immunol Ther Exp (Warsz)* 66(2): 89-96.
29. Fischer JP, Wes AM, Tuggle CT, Nelson JA, Tchou JC, et al. (2014) Mastectomy with or without immediate implant reconstruction has similar 30-day perioperative outcomes. *Br J Plast Surg* 67(11): 1515-1522.
30. Cheema BS, Kilbreath SL, Fahey PP, Delaney GP (2014) Safety and efficacy of progressive resistance training in breast cancer : a systematic review and meta-analysis. *Breast Cancer Res Treat* 148(2): 249-268.
31. Hassan MSU, Ansari J, Spooner D, Hussain SA (2010) Chemotherapy for breast cancer ( Review ). *Oncol Rep* 24(5): 1121-1131.
32. Crown J, O'Leary M, Ooi WS (2004) Docetaxel and Paclitaxel in the Treatment of Breast Cancer : A Review of Clinical Experience. *Oncologist* 9(suppl 2): 24-32.
33. Hussain SA, Palmer DH, Stevens A, Spooner D, Poole CJ, et al. (2005) Role of chemotherapy in breast cancer. *Expert Rev Anticancer Ther* 5(6): 1095-1110.
34. Wolfe CDA, Rudd AG (2011) Radiotherapy and survival in breast cancer. *Lancet* 378(9804): 1680-1682.
35. Trial R (2015) HHS Public Access. 1(7): 931-941.
36. Breast E, Trialists C, Group C (2011) Effect of radiotherapy after breast-conserving surgery on 10-year recurrence and 15-year breast cancer

- death : meta-analysis of individual patient data for 10 801 women in 17 randomised trials. *Lancet* 378(9804): 1707-1716.
37. Siesling S (2016) 10 year survival after breast-conserving surgery plus radiotherapy compared with mastectomy in early breast cancer in the Netherlands : a population-based study. *Lancet Oncol* 17(8): P1158-1170.
38. Hartmann-johnsen OJ, Kåresen R, Schlichting E, Nygård JF (2017) Better survival after breast-conserving therapy compared to mastectomy when axillary node status is positive in early-stage breast cancer : a registry-based follow-up study of 6387 Norwegian women participating in screening , primarily operated between 1998-2009. *World J Surg Oncol* 15(1): 118.
39. Hwang ES, Lichtensztajn DY, Gomez SL, Fowble B, Clarke CA, et al. (2013) Survival After Lumpectomy and Mastectomy for Early Stage Invasive Breast Cancer: The Effect of Age and Hormone Receptor Status. *Cancer* 119(7): 1402-1411.
40. Agarwal S, Pappas L, Neumayer L, Kokeny K, Agarwal J, et al. (2014) Effect of Breast Conservation Therapy vs Mastectomy on Disease-Specific Survival for Early-Stage Breast Cancer. *JAMA Surg* 149(3): 267-274.
41. Smith BD, Jiang J, Shih Y, Giordano SH, Huo J, et al. (2017) Cost and Complications of Local Therapies for Early-Stage Breast Cancer Cost and Complications of Local Therapies for Early-Stage Breast Cancer. *J Natl Cancer Inst* 109(1).
42. Article O, States U (2011) Disparities in the Application of Adjuvant Radiotherapy After Breast-Conserving Surgery for Early Stage Breast Cancer: impact on overall survival. *Cancer* 117(12): 2590-2598.
43. Lin H, Parker C (2016) HHS Public Access. 150(8): 778-786.
44. Lautner M, Lin H, Shen Y, Parker C, Kuerer H, et al. (2015) Disparities in the Use of Breast-Conserving Therapy Among Patients with Early-Stage Breast Cancer. *JAMA Surg* 150(8): 778-786.
45. Tuttle TM, Jarosek S, Habermann EB, Yee D, Yuan J, et al. (2012) Omission of Radiation Therapy After Breast-Conserving Surgery in the United States. *Cancer* 118(8): 2004-2013.
46. Krug D, Baumann R, Budach W, Dunst J, Feyer P, et al. (2017) Current controversies in radiotherapy for breast cancer. *Radiat Oncol* 12(1): 25.
47. Olson JA, Lively T, Badve SS, Saphner TJ, Wagner LI, et al. (2018) Adjuvant Chemotherapy Guided by a 21-Gene Expression Assay in Breast Cancer. *N Engl J Med* 379(2): 111-121.



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