Current Treatment Regimen for Breast Cancer

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Abstract

Breast cancer is one of the most commonly diagnosed cancer alongside the lung cancer and colorectal cancer, and the fourth leading cause of cancer-related deaths in worldwide. One of the major challenges for breast cancer treatment is its versatile nature, which selects the therapeutic options.

BC mainly categorized into 3 subtypes based on estrogen or progesterone receptor expression and HER2 expression. The selection of systematic therapy is based on the presence or expression of the receptors and DNA mutation. Triple negative BC is hard to treat because of the lack of expression [1].

Keywords: Breast Cancer; New Chemotherapy Regimen; HR Positive Breast Cancer; HER2 Negative; HER2 Positive; Triple Negative

Abbreviations

BC: Breast Cancer; HR: Hormone Receptor; HER2: Hormone Response Element; TNBC: Triple Negative Breast Cancer

Introduction

Breast cancer is one of the most commonly diagnosed cancer alongside the lung cancer and colorectal cancer, and the fourth leading cause of cancer-related deaths in worldwide. One of the major challenges for breast cancer treatment is its versatile nature, which selects the therapeutic options [1]. Breast cancer is classified into four sub types according to its molecular characters which are, (1) luminal A (HR+/HER2), (2) HER2+, (3) luminal B (HR+/HER2+) and (4) triple negative (TNBC; HR-/HER2-; also overlap with the basal-like subtype). Each of these subtypes are different in terms of its risk factors for incidence, therapeutic response, disease progression and preferential organ sites of metastases [2].

Breast cancer can be diagnosed with different procedure which includes, mammogram and its sub classification, biopsy, physical examination, ultrasound and breast MRI. And for staging the disease along with these procedures blood test, bone scan, CT scan and PCT scan can be carried out [3].

Materials and Methods

Conducted a search in PubMed and other sources for English-language articles related to the treatment of breast cancer form the year 2016. The indices of major medical and oncology journals were comprehensively reviewed and established a result [3].

Results and Discussion

Current treatment regimen for breast cancer

HR-positive breast cancer treatment

Targeted therapy is the method of using drugs and/or other substances to act on the cancer cells and produces the desired ef-

fect with less harm to normal cells. There is a new plan of adding targeted therapies and hormone therapy for advanced metastatic HR-positive breast cancer. These treatments will help to prolong the time until chemotherapy is required and ideally, with extend survival rate.

Drugs used in this include, Palbociclib (Ibrance), ribociclib (Kisqali), and everolimus (Afinitor) which all have been approved by the FDA recently to use with hormonal.

Abemaciclib (Verzenio) can be given with or after hormonal therapy to women with advanced metastatic, with ER positive, HRE2 negative. These combinations can prevent a relapse after treatment of early-stage ER-positive disease which was tested and conformed.

Alpelisib (Piqray) can be used for in combination with hormonal therapy to treat HR-positive and HER2-negative breast cancers that have a mutation in the PIK3CA gene.

HER2-positive breast cancer treatment

There are a number of combination which is approved by FDA, which includes: Trastuzumab (Herceptin) and pertuzumab (Perjeta) in alone or combination can be used with chemotherapy for both early stage and advanced breast cancer. Trastuzumab got approved for use to prevent a relapse in patients with early HER2-positive breast cancer.

Ado-trastuzumab emtansine (Kadcyla) is a treatment for advanced HER2-positive breast cancer got approved by FDA.

Lapatinib (Tykerb) got approved for treatment of HER2-positive metastatic BC. However, in another study it doesn't show significant effect.

Neratinib Maleate (Nerlynx) can be used in patients with early-stage HER2-positive BC and also can be used in combination with capecitabine (Xeloda) in some patients in advanced stage.

Triple-negative breast cancer

Due to the lack of HR and HER2 over expression triple negative BC is hardest of all PARP inhibitors, which include olaparib (Lynparza) and talazoparib (Talzenna), effectively target TNBC caused by different DNA mutation and damage. They also got approved for the treatment of metastatic ER-positive, HER2-negative BC in patients with gene mutation.

Immunotherapy drugs have shown effectiveness in small number of patients, Mainly those that are triple negative. Studies suggest that the immune therapy is more effective when the patients have their tumor expresses the protein PD-L1 or if it has a large number of mutations.

Studies are conducted to check the effectiveness of combination therapy. The immunotherapy drug atezolizumab (Tecentriq) got approved for using in combination with chemotherapy in patients with metastatic TNBC that expresses the PD-L1 protein [3-20].

Conclusion

Breast cancer classified in to 3 major tumor subtypes which is categorized accordingly to estrogen or progesterone receptor expression and HER2 expression. These 3 subtypes have their own distinct risk profiles and treatment strategies. Individualized therapy for each patient depends on tumor subtype, anatomic cancer stage and patients preferences are required or better therapeutic response [3].

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