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Editorial Open Access

"Breakthrough Therapies" for Breast Cancer Metastasis

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Editorial

Breast Cancer Metastasis (MBC) is an ultimate death sentence remains a challenge for clinicians worldwide.According to the Metastatic Breast Cancer (MBC) Awareness Network about 155,000 patients are living nowadays with *MBC*, and about 40,000 deaths are reported annually in the United States of America. About 10% of the patients visiting the clinic or appearing at the emergency sittings are diagnosed with stage IV breast cancer at the initial screening and require an urgent and effective treatment, which mainly focuses on controlling the disease and improve the quality of life. A breakthrough in the clinical trials for the treatment of breast cancer metastasis has been observed recently, most of these treatments are mainly drug therapies.

Recently, Palbociclib (Ibrance®) has breakthrough media and newspapers as an effective, novel and exciting drug that have received in Feb 2015 a granted accelerated approval by the FDA to be used in the clinical sittings in combination with Letrozole (Femara®) for patients with advanced Metastatic Breast Cancer (MBC). The drug has shown well tolerance with slight neutropenia. Palbociclib (Ibrance®) is a potent drug acts by selectively inhibiting CDK4 and 6. It prolongs and doubles the progression-free survival rate for patients with ER-positive/ HER2-negative MBC from 10.2 to 20.2 months as shown in several clinical trials on about 165 post-menstrual women when combined with Letrozole (Femara®) with no prior systemic therapy. Other studies have shown the possibility to be used also as a synergistic drug with both Transtuzumab (Herceptin®) (Herceptin®) and Tamoxifen (Nolvadex®) in patients with ER/HER2 positive MBC. Other CDK4, 6 inhibitors such as LY2835210 and LEE001 are also taking place in the clinical trials, however their development is still slow. Palbociclib (Ibrance®) trials were not limited to MBC, but have also been tested in leukemia, brain tumors and mantle cell lymphoma.

A multicenter study has described the effectiveness of using Eribulin Mesylate (Halaven®) in patients with Metastatic Breast Cancer (MBC) who had been heavily treated with chemotherapy; the study has proven the effectiveness of the drug with a clinical benefit at 6 months in approximately 40% of the total enrolled patients. This drug has also shown significant efficacy in brain metastasis. Eribulin is a microtubule dynamic inhibitor that has also shown significant effect on the Triple Negative Breast Cancer cells as well, a recent research has studied its mechanism of action and found that it decreases the expression of mesenchymal genes while increasing the epithelial markers, therefore it mainly works by reversing EMT and inhibiting Smad2 and Smad3 phosphorylation.

SYD985 is a novel antibody-drug conjugate based on Transtuzumab and (vc-seco-DUBA), this drug has significantly address the medical need for patient diagnosed with HER2 1+/2+ Metastatic Breast Cancer (MBC) including triple negative, and may include in the future as well FISH-negative/IHC-HER2 1+/2+ with no effective current medical treatment. The results have shown similar potency and activity of both drugs in cell lines expressing HER2 3+; however, SYD985 exhibit higher potency and activity against HER2 2+/1+ than T-DM1. SYD985 showed potent anti-tumor activity against FISH-negative cells with HER2 1+ or 2+, while T-DM1 did not show activity; this study indicates superior anti-tumor activity better than T-DM1.

Accordingly, significant and remarkable success have been made to treat Metastatic Breast Cancer (MBC), the above-mentioned drugs have delivered hope for those patients and enhanced the progression free-survival rate dramatically. Many novel therapies are also under clinical trial phases to improve the care and enhance the outcomes of Breast Cancer Metastasis.

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