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Case Report

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Complete response of Palbociclib in metastatic breast cancer patient: A case report

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Abstract

Palbociclib, an oral inhibitor of cyclin-dependent kinases 4 and 6 (CDK 4/6), has been approved for metastatic breast cancer (mBC) treatment of hormone receptor (HR)-positive/human epidermal growth factor receptor 2 (HER2)-negative. The study reported the efficacy of Palbociclib as a new oral drug in a patient with mBC. A 40-year-old female with stage 2 right BC change to stage 4 after about two years later referred to oncology clinic. Due to HR-positivity/HER2-negative, she has treated with Palbociclib 125 mg (per one day for two-week and one-week intervals) with Letrozole. In new assessment and after 8 months of this oral combination therapy, the chest x-ray of lung showed the complete response. Treatment with Palbociclib plus Letrozole had a complete response in the mBC patient after the common chemotherapies and hormone monotherapy.

1. Background

Breast cancer (BC) is the most frequent cancer among females that can be a leading problem of death through middle-aged females [1]. Palbociclib as an oral inhibitor of cyclin-dependent kinases 4 and 6 (CDK 4/6) present a critical function in cell cycle regulation [2]. Nowadays, this drug has been approved for the treatment of mBC of hormone receptor (HR)-positive/human epidermal growth factor receptor 2 (HER2)-negative [3]. Data show that Palbociclib is increased the response rate and duration in postmenopausal females with locally advanced or metastatic estrogen receptor (ER)-positive/HER2-negative BC [4]. This case showed the efficacy of Palbociclib as a new oral drug in mBC.

2. Case History

A 40-year-old female with stage 2 right BC referred to oncology clinic after modified radical mastectomy and axillary lymphadenectomy on March 16, 2014. In the history of the patient, hyperlipidemia, urinary tract infection, fatty liver grade 2 and ovarian cyst reported. She was treated with Epirubicin plus Paclitaxel for six cycles. After this treatment, the patient had the complaint of pain foot. Whole body scan showed bone metastases and the new pathology report was compatible with invasive and *in situ* (40%) or mixed mucinous ductal carcinoma of mBC. In immunohistochemistry staining for the tumor showed ER (Positive 1+), progesterone receptor (Positive 2+), Her2 (negative), Ki-67 (40% positive in tumoral cells), and P53 (Positive). She got 25 sessions of radiotherapy during 8 months and then was treated with Tamoxifen. Unfortunately, she went to worse condition with complaints of dyspnea. Chest computed tomography scan showed left lung metastasis in May 14, 2016 (Figure 1).

She was treated with Paclitaxel plus Carboplatin for eight courses. On November 15, 2016, due to hormone receptor-positivity/Her2-negative, she was treated with Palbociclib 125 mg (per one day for two-week and one-week intervals) with Letrozole. Before treatment of Palbociclib, Platelet, WBC, and hemoglobin (Hb) were the normal that after one course of this new treatment, WBC, Hb, and platelet became 3300, 11.5, and 57000, respectively, but they returned to normal range again in other courses. In the new assessment and after 8 months of this oral combination therapy, the chest x-ray of lung showed the complete response (clearing metastasis) (Figure 2). She is alive On March 1, 2018.

3. Discussion

Palbociclib represents a significant role in cell cycle regulation through phosphorylation of the retinoblastoma protein (Rb) and can inactivate Rb function as a tumor suppressor [5]. The trials comparing Palbociclib plus Letrozole compared to Letrozole alone or placebo plus Letrozole as first-line therapy for postmenopausal women with advanced ER+/HER2- BC showed the increase in progression-free survival [4,6,7]. One study [8] showed endocrine monotherapy has significant poor impact on patients with disease progression following previous exposure to endocrine therapy. In our study, oral combination therapy with Palbociclib plus Letrozole was done after two different protocols of chemotherapy before and after Tamoxifen. So it was observed a good result with the clearing lung metastasis. One trial reported the most common adverse events were neutropenia, leukopenia, fatigue, and nausea during Palbociclib therapy [8] as well as the anemia, thrombocytopenia, and neutropenia were other the most frequent adverse events in the trial of Finn *et al.* [6] that in the present case, there was leukopenia and thrombocytopenia as adverse events in the patient.



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Figure 1. Chest x-ray of lung before treatment.

4. Conclusion

Palbociclib plus Letrozole therapy had a complete response in the mBC patient after the common chemotherapies and hormone monotherapy.

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Figure 2. Chest x-ray of lung after treatment.

6. List of abbreviations

CDK: cyclin-dependent kinases; **ER:** estrogen receptor; **Hb:** hemoglobin; **HER2:** human epidermal growth factor receptor 2; **HR:** hormone receptor; **mBC:** metastatic breast cancer; **Rb:** retinoblastoma protein

7. Ethics approval and consent to participate

Not to be applied.

8. Competing interests

The authors declare that they have no conflicts of interest.

9. Funding

None.

10. Authors' contributions

Mehrdad Payandeh & Edris Sadeghi: Literature search, Clinical studies, Data acquisition, Data analysis; Edris Sadeghi: Manuscript preparation, Manuscript review, Guarantor; Masoud Sadeghi: Concepts, Design, Definition of intellectual content, Literature search, Manuscript editing. Mehrnoush Aeinfar & Saba Yari: Manuscript editing.

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