Pattern of failure and timing of progression on CDK4/6 inhibitor as first line therapy for HR+HER2- metastatic breast cancer invading different organ

Ruoh-Yun Gau1\*, Shin-Cheh Chen1, Hsiu-Pei Tsai1, Shih-che Shen1, Wen-Ling Kuo1, Hsu-Huan Chou1, Hui-yu Ho1, Chia-Hui Chu1, Wei-Shan Chung1, Yung-Chang Lin2, Meng-ting Peng2, Chan-Keng Yang2, Chi-Chang Yu1\*

1Division of Breast surgery, Department of Surgery, Linkou Chang Gung Memorial Hospital, Taoyuan, Taiwan

2Division of Hematology and oncology, Department of Internal medicine, Chang Gung Memorial Hospital, Linkou, Taoyuan, Taiwan

**Purpose**

To investigate the pattern and timing of failure on CDK4/6 inhibitor (CDK4/6i) as first line therapy in patients with HR+HER2- metastatic breast cancer (mBC) invading different organ.

**Materials and Methods**

A total of 172 patients with HR+HER2- mBC using CDK4/6i as first line therapy in Chang Gung Memorial Hospital from 2019 to 2022 were retrospectively reviewed, and grouped by initial invaded organs. The pattern and timing of failure were further analyzed among 84 patients with disease progression on CDK4/6i.

**Results**

The 172 patients were grouped by initial invaded organs: bone only (n=46, 26.6%), lung (n=64, 37.0%), liver (n=21, 12.1%), lung and liver (n=19, 11.0%), lymph node only (n=12, 6.9%) and atypical metastasis (n=10, 5.8%). The progression-free and overall survival were significantly different among the groups (p<0.001, p=0.020, respectively). In 84 patients with disease progression, patients with initial liver invasion tends to fail from progression of liver lesion (94.1%) rather than spreading to new organ (11.8%). Moreover, the timing of progression of liver metastasis was significantly shorter (median 12.0 month, 8.4-15.5) in patients with initial invasion of liver, compared to those without (median 36.0 months, 28.7-43.2) (p<0.001). This difference was not observed in mBC patients with initial invasion of bone (p=0.710) or lung (p=0.115).

**Conclusion**

Our findings demonstrate that pattern and timing of progression were significantly different among HR+HER2- mBC patients with different initial invaded organs using CDK4/6i as first line therapy. We suggested that close monitor of liver lesion should be considered in those with initial invasion of liver.