



Effects of Herceptin on circulating tumor cells in HER2 positive early breast cancer

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ABSTRACT. The objective of this study was to determine the changes in peripheral blood circulating tumor cells in HER2-positive early breast cancer before and after Herceptin therapy, and to explore the effects of the HER2 gene and Herceptin on circulating tumor cells. CK19 mRNA expression in peripheral blood was evaluated by qRT-PCR as an index of circulating tumor cells in 15 cases of HER2-positive breast cancer and 18 cases of HER2-negative breast cancer before, and after chemotherapy as well. Ten cases of HER2-positive breast cancer continued on Herceptin therapy for 3 months after chemotherapy, and their peripheral blood was again drawn and assayed for CK-19 mRNA expression. Preoperatively, all cases of HER2-positive cancer were positive for CK19 mRNA in peripheral blood, but 6 cases of HER2-negative breast cancer were positive (33.3%), where there was a substantial difference between the two groups. After 6 cycles of adjuvant chemotherapy, CK19 positive rates in cases of HER2-positive and -negative breast cancer reduced by 93.3 and 11.1%, respectively, with a significant difference still existing. After 3 months of Herceptin therapy, expression of CK19 mRNA declined

considerably in 10 cases of HER2 positive breast cancer (113.66 ± 88.65 vs 63.35 ± 49.27 , $P = 0.025$). HER-2 gene expression closely correlated with circulating tumor cells in peripheral blood of early breast cancer patients. Moreover, Herceptin, a monoclonal antibody for HER2, can reduce the number of circulating tumor cells, which can be an early predictive factor for Herceptin therapy effectiveness against breast cancer.

Key words: Herceptin; Breast cancer; Circulating tumor cells