Universe Scientific Publishing

Clinical Study of Endocrine Hormone Combined with Trastuzumab in Maintenance Treatment of HR and HER-2 Positive Advanced Breast Cancer

Xulong Zhu[1,2], Guangshuai Lin[1], Xinmiao Liu[1], Yangmeng Feng[1], Binliang Huo[1*]

1. Department of Surgical Oncology, Central Laboratory, Shaanxi Provincial People's Hospital, Xi'an 710068, China.

2. School of Life Science and Technology, Xi'an Jiaotong University, Xi'an 710049, China.

Abstract: **Objective:** To analyze the clinical effect of endocrine hormone combined with trastuzumab in maintenance therapy of HR (hormone receptor) and HER-2 (human epidermal growth factor receptor) positive advanced breast cancer. **Methods:** A total of 80 patients with HR and HER-2 positive advanced breast cancer admitted to our hospital from January 2020 to December 2022 were selected, and the 80 patients were divided into 2 groups by random number table method, the control group (N= 40) The patients in the observation group (N=40) were treated with trastuzumab, and the patients in the observation group (N=40) were treated with endocrine hormones and trastuzumab for maintenance. The therapeutic effects of the two groups were compared. **Results:** The two groups of patients had similar serum CD8+, CD4+, CD3+ before treatment and CD8+ after treatment (P>0.05). After treatment, the CD4+ and CD3+ in the observation group were higher than those in the control group (P<0.05). The total effective rate of the observation group was significantly higher than that of the control group. It was higher in the control group (P<0.05); the incidence of adverse reactions in the observation group was lower than that in the control group (P<0.05). **Conclusion:** Endocrine hormone combined with trastuzumab maintenance therapy for HR and HER-2 positive advanced breast cancer has significant clinical effect, can effectively improve the immune indexes of patients, and has less adverse reactions, which is worthy of clinical application.

Keywords: Endocrine Hormones; Trastuzumab; Hormone Receptors; Human Epidermal Growth Factor Receptor; Advanced Breast Cancer

Introduction

Breast cancer is caused by a variety of carcinogenic factors causing abnormal differentiation and proliferation of breast epithelial cells. At present, there is no clear conclusion on the cause of breast cancer. Some scholars believe that it is related to factors such as excess nutrition, endocrine hormones, excessive drinking, obesity, genetics and other factors. Later, the patient developed breast discharge, breast lump, and enlarged axillary lymph nodes. With the prolongation of the disease time, HR and HER-2 developed positive, the disease entered an advanced stage, cancer cells metastasized, and it may also cause multiple organ lesions, threatening the patient's life safety [1]. At present, there are many clinical treatment methods of acupuncture for advanced breast cancer, including targeted therapy, surgery, chemotherapy, endocrine therapy, drug therapy, and radiation therapy. In patients with HR and HER-2 positive advanced breast cancer, the effect of endocrine hormone combined with trastuzumab maintenance therapy was analyzed. The report is as follows:

1. Materials and methods

1.1 Normal information

A total of 80 patients with HR and HER-2 positive advanced breast cancer admitted to our hospital from January 2020 to December 2022 were selected. Inclusion criteria: ① The patients were diagnosed with advanced breast cancer by breast ultrasound, MRI, tumor markers and pathological examination breast cancer; ② Positive HR and HER-2 examinations,

breast lumps, and sunken skin; ③ Complete personal information; ④ Both patients and their family members are aware of the research content, voluntarily participate, and can cooperate with the research throughout the process; Exclusion criteria: ① Other serious organs disease; ② Drug allergy; ③ Mental illness, communication disorder, cognitive disorder; ④ Poor compliance, dropped out of the researcher; 80 patients were divided into 2 groups by random number table method, and the control group (N=40) was 21 males, 19 females, aged 32-75 years, mean age (53.5±4.2) years; observation group (N=40) 20 males and 20 females, aged 30-76 years, mean age (53.0±4.5) years; The two groups of patients were similar in gender and age (P>0.05) and were comparable.

1.2 Methods

The control group was only given trastuzumab (manufacturer: Shanghai Fuhong Henlius Bio-Pharmaceutical Co., Ltd.; Chinese medicine approved word: S20200019;) intravenous infusion, the initial dose was 8 mg/kg, and the infusion time was 90 min. The weekly maintenance dose was 6 mg/kg, the infusion time was 30 min, and the medication was administered once every 28 days for 6 months.

The observation group received the maintenance combination therapy of endocrine hormones and trastuzumab. The medication method of trastuzumab was the same as that of the control group. On the basis of trastuzumab, fulvestrant injection (manufacturer: AstraZeneca UK Limited; Approval number: H20100407), each dose is 10ml, once every 28 days, and the medication time is 6 months.

1.3 Observation indicator

(1) The CD8+, CD4+, CD3+ of the two groups of patients before and after treatment were recorded [2].

(2) Evaluate the clinical effect of the patient, markedly effective: the clinical symptoms of the patient disappeared completely, and the disease was well controlled; effective: the clinical symptoms of the patient were significantly improved, and the disease was well controlled; ineffective: the clinical symptoms and the condition of the patient did not improve; total effective rate = (number of markedly effective cases + number of effective cases)/total number of cases × 100%.

(3) The incidence of adverse reactions such as nausea and vomiting, fatigue, thrombocytopenia, and bone marrow suppression in the two groups were recorded.

1.4 Statistical methods

SPSS 24.0 statistical software was used for data analysis, measurement data were expressed as mean ± standard deviation (±s), and t-test was used for comparison between two groups; count data was expressed as rate, and $\chi 2$ test was used for comparison between groups, with P<0.05 as the difference was statistically significant.

2. Results

2.1 CD8+, CD4+, CD3+ in the two groups before and after treatment

Serum CD8+, CD4+, CD3+ before treatment and CD8+ after treatment were similar in the two groups (P > 0.05), and CD4+ and CD3+ after treatment in the observation group were higher than those in the control group (P < 0.05). The data are shown in Table 1 below.

Table 1 Comparison of CD8+, CD4+, CD3+ in the two groups before and after treatment (±s.%)

Group	Number of cases	$CD8^+$		$CD4^+$		$CD3^+$	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Observation group	40	29.32±6.96	29.91±6.85	30.72±5.33	27.81±5.04	61.14±5.46	50.63±5.32
Control group	40	29.54±6.50	29.86±6.72	29.89±6.14	24.02±5.10	61.05±5.69	38.71±5.67
t	-	0.1461	0.0329	0.6456	3.3430	0.0721	9.6962
p	-	0.8842	0.9738	0.5204	0.0013	0.9426	0.0000

2.2 Comparison of treatment effect between two groups of patients

The total effective rate of the observation group was 95.00%, and that of the control group was 65.00%. The total effective rate of the observation group was significantly higher than that of the control group ($P < 0.05$). The data are shown in Table 2 below.

Table 2 Comparison of treatment effect between the two groups [n. (%)]

Group	Number of cases	Excellent	Effective	Invalid	Total effective rate
Observation group	40	14（35.00）	24（60.00）	2（5.00）	38（95.00）
Control group	40	8（20.00）	18（45.00）	14（35.00）	26（65.00）
X^2	-				11.2500
P	-				0.0007

Comparison of the incidence of adverse reactions in the two groups of patients

The incidence of adverse reactions in the observation group was 10.00%, and that in the control group was 30.00%. The incidence of adverse reactions in the observation group was significantly lower than that in the control group ($P < 0.05$). The data are shown in Table 3 below.

Table 3 Comparison of incidence of adverse reactions between the two groups [n. (%)]

Group	Number of cases	Nausea and vomiting	Fatigue	Cytopenia	Bone marrow suppression	Incidence of adverse reactions
Observation group	40	2（5.00）	2（5.00）	0（0.00）	0（0.00）	4（10.00）
Control group	40	5（12.50）	4（10.00）	1（2.50）	2（5.00）	12（30.00）
X^2	-					8.6580
P	-					0.0032

3. Discussion

Breast cancer is a disease with high incidence in breast surgery, and ranks the forefront in the incidence of female malignant tumors. According to relevant statistics [3], the incidence of breast cancer in women worldwide accounts for 24.2%, and the incidence in developing countries accounts for 52.9%. In recent years, the incidence has been increasing, and the incidence group tends to be younger. The age of onset was mainly concentrated in the 45–50-year-old group. Early breast cancer has no obvious clinical symptoms, the breast bump, breast skin abnormalities, abnormal, nipple and areola of breast discharge, anemia, fever, the symptom such as anorexia, loss of appetite, emaciation, illness has developed to the late, after the surgery, if the patient testing positive for HR, its ehrs - 2, need to have targeted therapy and endocrine therapy after surgery, In order to avoid the metastasis of cancer cells and the aggravation of the disease leading to the death of patients [4].

Clinical on HR and its ehrs - 2 positive patients with advanced breast cancer mainly drug treatment, by bead sheet resistance is a recombinant DNA derived humanized monoclonal antibody, belong to solid tumor humanized against its ehrs - 2 receptor single drug resistance, drug antagonism in the antigrowth factor can control tumor cell growth, have ligand mediated the biological function of blocking effect, it is a common anti-HER-2 drug with high targeting and affinity in tumor cells. In the process of treatment, the HER-2 gene is taken as the target to block the signal transduction pathway mediated by HER-2, cause the degradation of HER-2 receptor protein, reduce the concentration of HER-2 in cell membrane, organize blood vessels and tumor growth, arrest cells in G1 phase, and kill tumor cells. Improve the survival rate of patients [5]. Fulvestrant is an endocrine therapy drug, which is a competitive estrogen receptor antagonist. In the process of treatment, the estrogen receptor on the surface of tumor cells competently binds, tissues cancer cells and estrogen, and tissues tumor growth to achieve anti-tumor effect [6]. In this study, it was found that the serum CD8+, CD4+, CD3+ indexes before treatment and CD8+ indexes after treatment were similar between the two groups ($P > 0.05$), and the CD4+ and CD3+ indexes after treatment in the observation group were higher than those in the control group ($P < 0.05$). The total effective rate of the observation group was significantly higher than that of the control group ($P < 0.05$). The incidence of adverse reactions in the observation group was lower than that in the control group ($P < 0.05$). The results suggest that endocrine hormone combined with trastuzumab maintenance therapy for HR and HER-2 positive advanced breast cancer is significantly more effective than single trastuzumab treatment, and can avoid nausea and vomiting, fatigue, thrombocytopenia, bone marrow suppression and other adverse reactions.

In conclusion, endocrine hormone combined with trastuzumab maintenance treatment for HR and HER-2 positive advanced breast cancer can effectively improve the immune indicators of patients with less adverse reactions, which is worthy of clinical application.

References

[1] Song ZJ. Effect of Trastuzumab Combined with Tamoxifen in the Treatment of Estrogen Receptor and Human Epidermal Growth Factor Receptor 2 Positive Advanced Breast Cancer [J]. Chinese Journal of Primary Medicine, 2018,25(11):1424-1427.

[2] Huang L, Wang DF, Li HL, et al. Survival Analysis of Everolimus Combined with Endocrine Therapy in Patients with Advanced Hormone Receptor-positive HER-2 negative Breast Cancer [J]. Chinese Journal of Gerontology, 2019, 39(8):1833-1836.

[3] Shen CY, Jin XX, Wang SL. Effects of Trastuzumab Combined with GEM and CAP Chemotherapy on Serum T cell Subsets, TPS Levels and Quality of Life in Patients with HER-2 Positive Advanced Breast Cancer [J]. China Medical Review,2019,16(19):93-97.

[4] Yun ZH, Li HP. Research Progress of Multi-targeted Therapy for Hormone Receptor-Positive/Human Epidermal Growth Factor Receptor-2 Positive Advanced Breast Cancer [J]. Cancer Progression,2021,19(18):1852-1857,1867.

[5] Breast Cancer Expert Committee of National Cancer Quality Control Center, Cancer Drug Clinical Research Committee of Chinese Anti-Cancer Association. Clinical Application of CDK4/6 Inhibitor in the Treatment of Hormone Receptor-positive Human Epidermal Growth Factor Receptor-2 Negative Advanced Breast Cancer [J]. Chinese Journal of Oncology, 2021,43(4):405-413.

[6] Chang W, Ding M, Zhou JH, et al. Efficacy and Safety of Trastuzumab Combined with Paclitaxel in the Treatment of Human Epidermal Growth Factor Receptor-2 Overexpressing Metastatic Breast Cancer [J]. Journal of Xinxiang Medical College, 2018, 35(6): 517-520.

Acknowledgments:

This work was supported by the Xi`an City Innovation Ability Enhancement Basic Plan, Medical Research Project（21YXYJ0092）, Clinical Research Fund of Wu Jieping Medical Foundation（320.6750.2021-10-39) and Clinical Research Center for Breast Diseases of Shaanxi Province (S2021-0-ZC-LCZX-0002).