Effect of Huangqi Fuzheng Decoction on Immune Function in Patients with Breast Cancer Undergoing Postoperative Chemotherapy

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Abstract: Objective: To analyze the application effect of Huangqi Fuzheng decoction in postoperative chemotherapy of breast cancer and its influence on immune function of patients. Methods: Eighty breast cancer patients who underwent surgical treatment from January 2021 to May 2022 were selected and randomly divided into two groups. The control group only received conventional chemotherapy regimen.The observation group was added Huangqi Fuzheng decoction on the basis of the control group. The incidence of adverse reactions of chemotherapy was compared between the two groups,the changes of immune indexes, quality of life score and sleep quality score before and after treatment were compared between the two groups. Results: ① The incidence of adverse reactions in the observation group was lower than that in the control group ($P < 0.05$). ② The changes of CD4+, CD8+, CD4+/CD8+ in the observation group before and after treatment were higher than those in the control group ($P < 0.05$). ③ The changes of quality of life score and sleep quality score before and after treatment in the observation group were higher than those in the control group ($P < 0.05$). Conclusion: The application of Huangqi Fuzheng decoction is helpful to reduce the incidence of adverse reactions of chemotherapy and improve the immune function of patients, so as to improve the quality of life and sleep quality of patients.So it can be widely used.
***Keywords*:** Huangqi Fuzheng decoction, radical mastectomy for breast cancer, postoperative chemotherapy, the immune function

Breast cancer is a common gynecological malignant tumor, which poses a great threat to the health of patients. In recent years, with the increasing incidence of breast cancer, it has attracted extensive clinical attention[1]. At present, surgery is the main clinical treatment. Postoperative adjuvant chemotherapy can further reduce the recurrence rate of this disease and prolong the survival time of patients. However,chemotherapy can damage normal cells while killing cancer cells.At the same time,a variety of adverse reactions are added,such as nausea,vomiting, liver and kidney function injury, bone marrow suppression, etc.These adverse reactions will affect the quality of life of patients[2].Effective interventions are therefore needed. With the wide application of traditional Chinese medicine in modern medicine, it has been found that traditional Chinese medicine has high efficacy and safety in improving postoperative chemotherapy patients with breast cancer. Traditional Chinese medicine can reduce the occurrence of adverse reactions, improve the immune function of patients and help improve the prognosis of patients[3]. In order to observe the application value of Huangqi Fuzheng Decoction, this paper selected 80 breast cancer patients who underwent surgical treatment from January 2021 to May 2022 for comparative observation, and the research is as follows.

1. Data and methods

1.1 Clinical Data

A total of 80 breast cancer patients undergoing surgical treatment from January 2021 to May 2022 were selected and randomly divided into groups. The patients in the observation group were all female, aged 26-47 years, with an average age of (32.6±4.6) years; TNM staging: 10 cases of stage II, 24 cases of stage III, and 6 cases of stage IV; 27 cases of ER and PR were positive , 7 cases of HER-2 positive, 6 cases of triple negative. The patients in the control group were all female, aged 39-79 years, with an average age of (55.3±4.1) years; TNM stage: 12 cases of stage II, 23 cases of stage III, and 5 cases of stage IV; 26 cases of ER and PR were positive , 9 cases of HER-2 positive, 5 cases of triple negative. This study was approved by the Hospital Ethics Committee. Inclusion criteria: ①Patients who were diagnosed with breast cancer by surgical pathological examination and received chemotherapy after surgery; ②Patients and their family members were informed of the study and voluntarily signed the consent form. Exclusion criteria: ① patients with severe liver and kidney failure; ② patients with allergic constitution. There was no statistically significant difference between the two groups in terms of general data and they were comparable.

1.2 Methods

The control group only took conventional chemotherapy regimens, according to the csco guidelines for breast cancer chemotherapy regimens. For example, the HER-2 positive chemotherapy regimen is epirubicin + cyclophosphamide followed by paclitaxel + trastuzumab + pertuzumab. The specific plan is: d1, 100mg/m2 epirubicin; d1, 600mg/m2 cyclophosphamide, 21 days as a course of treatment, 4 courses of continuous chemotherapy. The sequential treatment plan is: d1, 80mg/m2 paclitaxel, 7 days as a course of treatment, continuous administration for 12 weeks; d1, the first dose of trastuzumab is 8 mg/kg, followed by 6 mg/kg dose On d1, the first dose of pertuzumab was 840 mg, followed by 42 mg, 21 days as a course of treatment, and continuous chemotherapy for 1 year. Triple-negative patients need to take AC-T chemotherapy regimen, the specific method is: d1, 100mg/m2 epirubicin; d1, 600mg/m2 cyclophosphamide, 21 days as a course of treatment, 4 consecutive courses of chemotherapy. The sequential treatment plan is: d1, 80mg/m2 paclitaxel, 7 days as a course of treatment, continuous administration for 12 weeks.

In the observation group, Huangqi Fuzheng decoction was added on the basis of the control group, and the chemotherapy regimen was the same as that of the control group. The formula of Huangqi Fuzheng decoction was:Sealwort,wolfberry, Ligustrum lucidum, Ganoderma lucidum 10g, Astragalus 15g; Dialectical addition and subtraction, 10g pinellia pinellia can be added to patients with severe nausea and vomiting symptoms.10g psoralea can be added to patients with bone marrow suppression.10g night rattan can be added to patients with upset and impatient. Decocted with water, one dose per day, two times in the morning and evening.

1.3 Observation Indicators

The incidence of adverse reactions was compared between the two groups. ② The changes of immune indexes, quality of life score and sleep quality score before and after treatment were compared between the two groups. In this study, 5mL fasting venous blood was collected before and after treatment, and flow cytometry was used to measure CD4+ lymphocytes, CD8+ lymphocytes, and CD4+/CD8+. At the same time, the quality of life scale was used to evaluate the quality of life of patients. The higher the score, the higher the quality of life of patients. Pittsburgh Sleep Quality Index was used to evaluate the sleep quality of patients, and the higher the score, the lower the sleep quality of patients.

1.4 Statistical analysis

SPSS22.0 statistical software was used for statistical analysis, measurement data were expressed by standard deviation, measurement values of the two groups were expressed by t-value test, count data were expressed by percentage, and the calculated values of the two groups were analyzed by X^2 value test. $P < 0.05$ was considered statistically significant.

2. Results

2.1 Difference in incidence of adverse chemotherapy reactions between the two groups

The incidence of chemotherapy adverse reactions in the observation group was lower than that in the control group ($P < 0.05$), as shown in Table 1.

Table 1. Differences in the incidence of adverse chemotherapy reactions between the two groups

Groups	Nausea and vomiting	Myelosuppression	Liver and kidney function damage	Total Incidence（%）
Observation group（n=40）	2	1	1	10.0
Control group（n=40）	4	3	2	22.5
X^2				5.165
P				0.041

2.2 Changes of immune indexes in the two groups

The changes of CD4+、CD8+、CD4+/CD8+ in the observation group before and after treatment were higher than those in the control group ($P < 0.05$), as shown in Table 2.

Table 2. Changes of immune function in the two groups

Groups	CD4+（%）		CD8+（%）		CD4+/CD8+	
	Pr-treatment	Post-treatment	Pr-treatment	Post-treatment	Pr-treatment	Post-treatment
Observation group	35.1±5.4	42.5±6.2	30.5±4.1	26.5±3.6	1.0±0.3	1.5±0.7
Control group	35.2±5.3	39.1±5.1	30.6±4.2	28.5±4.1	1.1±0.3	1.3±0.5
T value	1.235	5.263	1.168	5.118	1.325	5.365
P value	0.114	0.042	0.107	0.041	0.123	0.043

2.3 Changes in scores of the two groups

The changes of quality of life score and sleep quality score in the observation group before and after treatment were higher than those in the control group ($P < 0.05$), as shown in Table 3.

Table 3. Changes in scores of the two Groups (points)

Groups	living quality scores		Sleep quality score	
	Pr-treatment	Post-treatment	Pr-treatment	Post-treatment
Observation group	60.2±1.2	74.6±0.8	12.6±4.2	8.6±2.1
Control group	60.3±1.3	67.2±1.0	12.5±4.1	10.4±3.2
T value	1.235	5.231	1.154	5.326
P value	1.114	0.042	0.106	0.043

3. Discussion

Breast cancer is the most common malignant tumor in gynecology. With the change of modern women's living environment, the incidence of breast cancer is also increasing year by year, whichhas attracted extensive attention in clinical medicine[4]. At present, there are many clinical treatment options for this disease, including surgery, chemoradiotherapy, targeted therapy, immunotherapy, etc., among which surgery is the main treatment option. For middle and advanced patients, postoperative adjuvant chemotherapy is helpful to further prevent disease recurrence and improve clinical efficacy[5]. However, chemotherapy drugs can cause more adverse reactions, and some patients even interrupt treatment because of intolerance to adverse reactions, which affects the prognosis of patients. Effective interventions are therefore needed.

Traditional Chinese medicine scholars believe that breast cancer patients with postoperative radiotherapy are mostly characterized by deficiency of vital qi, deficiency of vital qi and blood, and invasion of pathogenic toxins, which lead to meridians and collaterals block, phlegm and blood stasis block, so they are mostly characterized by deficiency of both qi and Yin, deficiency of both qi and blood, etc. Huangqi Fuzheng Decoction is a classic TCM recipe.Astragalus and ganoderma lucidum have the effect of tonifying qi and helping Yang.Wolfberry can nourish liver and kidney.Ligustrum fructus has the effect of nourishing Yin and nourishing essence.Sealwort strengthens spleen and kidney and qi. The whole recipe can achieve the effect of tonifying spleen and kidney and regulating Yin and Yang[6]. This prescription has a good therapeutic effect on people with low immunity. It has been proved by clinical experiments that it can improve the immune function of tumor patients. Breast cancer, surgery and chemotherapy will affect the immune function of patients. Therefore, the use of Huangqi Fuzheng decoction can further improve the immunity of patients ,at the same time prolong their survival time and help improve the prognosis of patients.

In this study, the five flavors of Huangqi Fuzheng Decoction have been proved by pharmacological studies to have the effect of enhancing the body's immunity, so it can improve the immune function of breast cancer patients. Astragalus contains a variety of active components, including polysaccharides, saponins, amino acids, linoleic acid, alkaloids, choline, etc., which has anti-tumor, anti-virus and immunological functions. It can promote tumor cell apoptosis and anti-tumor angiogenesis, so as to achieve anti-tumor effect.Ganoderma lucidum is a kind of precious Chinese herbal medicine and its chemical composition is complicated.The main active components are polysaccharides and triterpenes which have anti-tumor, anti-aging and immune-regulating effects. Ganoderic acid in Ganoderma lucidum has cytotoxic effects on a variety of tumor cells and can effectively inhibit tumor growth and metastasis, thus prolonging the survival of patients [7]. Sealwort contains aspartate, polysaccharide and anthraquinone compounds. It has the functions of lowering blood glucose and blood lipid, anti-oxidation, anti-tumor and immunomodulatory. It has been found in vitro that it can effectively inhibit the growth of sarcoma cells, breast cancer cells and can improve the immune function of the body so as to achieve the effect of inhibiting tumor growth. Wolfberry contains a variety of nutritional elements and active substances. In addition to the medical effect, it also has food value, which can play the effect of anti-tumor, lowering blood sugar and lipids, anti-aging and regulating immunity. Clinical studies have found that LBP can accelerate the differentiation and maturation of dendritic cells [8].Fructus Ligustri contains triterpenoids lipid-soluble active components, which have anti-inflammatory, anti-aging and immune-regulating effects, among which Fructus Ligustri polysaccharide has a good immune-regulating effect. In this study, the incidence of chemotherapy adverse reactions in the observation group was lower than that in the control group ($P < 0.05$), indicating that Huangqi Fuzheng decoction can reduce the incidence of chemotherapy adverse reactions in patients. The changes of CD4+、CD8+、CD4+/CD8+ in the observation group before and after treatment were higher than those in the control group ($P < 0.05$), which indicated that Huangqi Fuzheng decoction could effectively improve the immune function of patients. The changes of quality of life score and sleep quality score in the observation group before and after treatment were higher than those in the control group ($P < 0.05$), indicating that Huangqi Fuzheng decoction can improve the

prognosis of patients. However, due to the small number of samples in this study, it is necessary to further expand the number of samples for multicenter randomized controlled observation, so as to improve the credibility of the research conclusions.

In conclusion, the application of Huangqi Fuzheng decoction is helpful to reduce the incidence of adverse reactions of chemotherapy, improve the immune function of patients, and thus improve the quality of life and sleep of patients, which can be widely used.

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