ISSN 2706-6819 Vol.3, Issue 2: 37-42, DOI: 10.25236/IJFM.2021.030208

Research Progress of Traditional Chinese Medicine Injection for Improving the Quality of Life of Cancer Patients

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Abstract: *Traditional Chinese medicine injection is widely used in the treatment of cancer patients. It can reduce toxins and increase efficacy for patients with radiotherapy and chemotherapy, thereby improving patients' living quality. The curative effect is remarkable. Based on its more and more in-depth researches, the treatment of Chinese medicine injection in tumors is studied in this paper from the aspects of basic research and clinical research.*

Keywords: *Chinese medicine injection, tumor, living quality*

In recent years, due to environmental degradation, improper diet, radiation and many other factors, the incidence of malignant tumors has gradually increased. WHO reported that more than 10 million people die of malignant tumors worldwide each year. Among the various clinical treatments such as surgery, chemotherapy, and radiotherapy, chemotherapy as a systemic treatment can prolong the survival time of most patients. However, studies have shown that conventional chemotherapy regimens with the ability of killing body's normal proliferation and differentiated cells can significantly inhibit the immune function of patients, weaken body's anti-tumor immunity and affect the long-term survival rate of patients. Therefore, how to improve the effect of chemotherapy and reduce its adverse reactions is a problem that needs to be solved urgently in the current tumor clinic. These adverse symptoms are closely related to the cancer patients' quality of life. Quite a number of clinical research reports show that patients' quality of life has deteriorated.

Cancer always belongs to the categories of "sickness" and "accumulation" in Chinese medicine. A large number of clinical studies have found that TCM therapy can significantly improve the patients' quality of life with advanced malignant tumors [1]. With the development of traditional Chinese medicine pharmaceutical technology, a variety of traditional Chinese medicine injections have been widely used in clinical treatment. The emergence of traditional Chinese medicine injection has pushed the way of traditional Chinese medicine administration to be changed into the dominant intravenous infusion, acupoint injection and other medication methods, thus providing more options for clinical treatment. Traditional Chinese medicine injection can not only inhibit the growth of tumors, but also have a certain effect on improving cellular immune function, thereby improving the patient's own immunity, regulating the internal environment in the body, and alleviating the adverse gastrointestinal reactions caused by chemotherapy drugs, bone marrow suppression and other organ damages, so as to improve the patient's life cycle and quality of life. In recent years, scholars have conducted a lot of research on the anti-tumor mechanism of Chinese medicine injection. The research progress in recent years is summarized as follows.

1. Basic research on traditional Chinese medicine injection

1.1 Cell experiment

Zhang studied the immunomodulatory effects of water-soluble polysaccharides in ginseng, and obtained two types of ginseng polysaccharides through ion exchange, ethanol precipitation and gel permeation separation and purification [2]. Using the lymphocyte proliferation test, the results showed

ISSN 2706-6819 Vol.3, Issue 2: 37-42, DOI: 10.25236/IJFM.2021.030208

that both neutral polysaccharides and acidic polysaccharides can stimulate the proliferation of T lymphocytes and B lymphocytes, indicating that both polysaccharides have immunomodulatory activity. Ren Ming extracted and isolated ginseng polysaccharides from ginseng, and conducted preliminary identification and analysis to observe the anti-tumor activity of ginseng polysaccharides in vitro [3]. Compared with the control group, the CTL experiment showed that the release rate of cytotoxic lactate dehydrogenase in different concentrations of ginseng polysaccharide group increased significantly; with the increase of ginseng polysaccharide concentration, the release rate of cytotoxic lactate dehydrogenase first increased and then decreased. The concentration of ginseng polysaccharide was 100mg ·At L-1, the release rate of cytotoxic lactate dehydrogenase is the highest. It is concluded that as an immunostimulant, ginseng polysaccharide can stimulate various immune active cells in the body, affect their differentiation, maturation and reproduction, and improve the body itself Its immune defense function can also induce cell apoptosis through direct loss of tumor cell DNA. When ginseng polysaccharide is combined with interferon, it can activate the NF-κB pathway to enhance the immune function of macrophages, and enhance the expression of interleukin 1, interleukin 6, interleukin 12 and interleukin 18.Bao Zhuo discussed the effects of Shenqi Fuzheng injection combined with chemotherapy on peripheral blood T lymphocyte subsets CD3+, CD4+ and CD4+/CD8+ and tumor markers. The conclusion showed that Shenqi Fuzheng injection combined with chemotherapy can improve the cellular immune function of patients and reduce The levels of CEA, CA125 and CA199, and the side effects are small [4].

Dale Xun clarified the effect of lentinan on the proliferation and anti-tumor activity of cytokine-induced killer cells in vitro, and provided a theoretical basis for clinical application of lentinan to improve the efficacy of CIK cell adoptive immunotherapy [5]. The CD3 and CD56 double positive rates of CIK cells induced by 25, 50 and 75ug/ml lentinan were significantly higher than those in the blank control group. The 50ug/ml lentinan induction group had the highest killing rate on lung cancer cells. The conclusion shows that treatment of CIK cells with proper concentration of lentinan can increase the double positive rate of CD3 and CD56, and at the same time can increase the killing rate of CIK cells on lung cancer A549 cell line. Wu Xiaoqing [6] and others explored the effect of lentinan on the expression of immunogenic death-related molecules, immune checkpoint-related molecules and antigen presenting molecules in human lung gland cells A549, using CCK8 method to detect and analyze 0.4~12.8 μg/μL The effect of lentinan on the survival rate of A549 cells after 24 h and 48 h respectively. The study found that lentinan has an inhibitory effect on the proliferation of A549 cells and is time- and concentration-dependent; the results verified the ability of lentinan to induce tumor immunogenic cell death, so lentinan was determined as an ICD inducer, and lentinan has an effect on the body The anti-tumor effect has a positive impact.

1.2 Animal experiment

A study on the effect of Shenqi Fuzheng injection combined with docetaxel on the immune function of lung cancer mouse models found that the combined treatment of Shenqi Fuzheng can reduce tumor mass, improve mouse caspase-3, IL-2 activity and A549 cell caspase -3. Caspase-9 activity inhibits the bcl-2 activity of A549 cells, improves the efficacy by inducing tumor cell apoptosis, and plays a key role in immune protection [7]. At the same time, the combination of Shenqi Fuzheng injection and docetaxel may have strong humoral immune function.

Wang Yongqing explored the anti-tumor effect of astragalus polysaccharide combined with cisplatin on Lewis lung cancer mice and its possible mechanism. Experimental study found that the expression of Fas and p53 in tumor tissues of the cisplatin group and the astragalus polysaccharide low, medium and high dose groups were higher than that of the model group. Peripheral blood CD3+, CD4+, CD8+ ratio and CD4+/CD8+ ratio of low, medium and high polysaccharide groups were higher than those of cisplatin group and model group. Combination of astragalus polysaccharides on the basis of cisplatin therapy can improve the immune function of lung cancer mice, thereby enhancing Its own anti-tumor ability, inhibition of tumor growth, inhibition of VEGF expression, increase of Endostatin protein expression and immune function are possible mechanisms [8]. Zhuang Mengjie observed the effects of astragalus polysaccharide and combined with cisplatin on the expression of apoptosis protein cytochrome C and high temperature essential serine protease A2 in Lewis lung cancer mice. The study showed that compared with the model group of mice, 200ug/ml astragalus polysaccharide combined with 3mg/kg cisplatin The tumor cell necrosis of mice was the most obvious, and the protein levels of CytC and Omi/HtrA2 in the tumor tissue of each treatment group increased, and the tumor tissue of 200ug/ml astragalus polysaccharide combined with 3mg/kg cisplatin mice increased the most [9]. Astragalus polysaccharides and astragalus polysaccharides combined with cisplatin can inhibit the

ISSN 2706-6819 Vol.3, Issue 2: 37-42, DOI: 10.25236/IJFM.2021.030208

growth of tumors in Lewis lung cancer mice, promote the necrosis of tumor cells, reduce the levels of TNF-α and interleukin 6 in rats with acute lung injury, and reduce the pathological damage of lung tissues .

Jing Huan studied the effect of lentinan combined with cisplatin on the expression of S-100 protein in solid tumors in Lewis lung cancer tumor-bearing mice. The experimental results showed that the expression levels of S-100 protein and mRNA in tumor tissues were in the lentinan group, cisplatin group, or The lentinan + cisplatin group increased more than the tumor-bearing group, and the lentinan + cisplatin group increased more than the lentinan group and the cisplatin group. The combination of lentinan and cisplatin had a synergistic effect in upregulating the expression of S-100 protein and genes [10] . Ai Liang (11) and others discussed the immunomodulatory effect and anti-tumor activity of the combined use of lentinan and Yunzhi glycopeptide on immunosuppressive mice and lung cancer mice. Studies have shown that after the combined treatment of lentinan and Yunzhi glycopeptide, The high expression of Th17A in the tumor microenvironment has a positive effect on mice with lung cancer. It exerts immune regulation and even anti-tumor effects by increasing IL-2, TNF, IFN-γ and IL-17A levels and reducing IL-10.

2. Clinical research on traditional Chinese medicine injection

There are many kinds of traditional Chinese medicine injections that can be used for tumor treatment in clinical reports. They have shown good curative effects in the treatment of middle and advanced tumors, effectively improving the quality of life of patients. Compared with traditional Chinese medicine oral drugs, the effective drugs characterized by higher concentration, convenient application, quick onset, and easy acceptance by patients makes its clinical application range gradually expand. The followings are commonly used for lung cancer:

2.1 Shenqi Fuzheng Injection

The main components of Shenqi Fuzheng Injection are Codonopsis, Astragalus and Sodium Chloride (for injection). Functions and indications: Replenishing Qi and strengthening the body It is used for the adjuvant treatment of the above symptoms caused by the deficiency of lung and spleen Qi, lack of energy, lazy speech, spontaneous sweating and dizziness; Pharmacological effects indicate that it can enhance the phagocytic function of mononuclear macrophages. Deng Yan's research on hematopoietic and immune function intervention in 162 patients with advanced non-small cell lung cancer chemotherapy found that Shenqi Fuzheng injection can protect the bone marrow, reduce the inhibition of chemotherapy on the bone marrow hematopoietic function, and can improve the patient's cellular immune function and reduce the adverse effects of chemotherapy patients The incidence of reaction, improve clinical symptoms [12]. 78 patients in the observation group were given intravenous drip of Shenqi Fuzheng injection 3 days before chemotherapy, and the course of treatment was synchronized with chemotherapy. 21 days was a course of treatment. After 2 cycles of treatment, patients in the study group had IL-2, LTT, CD3+, CD4+, The level of NK was significantly higher than that of the control group; the incidence of adverse reactions in patients with leukopenia (71.8%), gastrointestinal reactions (37.2%) and renal impairment (8.9%) was lower than that of the control group (90.5%, 59.5%, 20.2%); A large number of studies have shown that Shenqi Fuzheng injection has a certain attenuation effect in the process of adjuvant treatment of various malignant tumors, improving its body immunity and quality of daily life, thereby well solving the clinical toxicity of radiotherapy and chemotherapy. The problem of strong side effects and the patient's inability to adhere to treatment.

2.2 Lentinan injection

The effective ingredients of lentinan injection are extracted from the seeds of lentinus edodes, which cannot directly kill tumor cells in the body, but has a certain specific and non-specific immune enhancement effect, which can be achieved by stimulating the immune response of lymphocytes to mature, "differentiate", proliferate, and form antibodies. Improve the body's immune function, thereby exerting anti-tumor effects through autoimmune enhancement [13]. Wei Ying's study on the effect of chemotherapy and quality of life in 86 patients with advanced lung cancer found that lentinan injection has a significant effect on the treatment of advanced lung cancer, protects immune function and reduces toxic side effects, and improves the quality of life of patients [14]. 43 patients in the treatment group were given intravenous drip of lentinan injection on the basis of the treatment of docetaxel and cisplatin, 2 times/week, with 1 course of treatment for 4 weeks, and after 2 consecutive courses of treatment, the

ISSN 2706-6819 Vol.3, Issue 2: 37-42, DOI: 10.25236/IJFM.2021.030208

two groups of patients were analyzed and compared. Tumor volume changes and evaluation of curative effect, and monitoring the changes in immune indicators and drug side effects of the patients, the results showed that: the incidence of gastrointestinal reactions, bone marrow suppression, and liver and kidney insufficiency in the treatment group were lower than those in the control group, and the two groups were alopecia and hair loss. There was no statistically significant difference in neurotoxic side effects; the therapeutic effect and quality of life of the treatment group were significantly better than those of the control group, indicating that lentinan can improve the clinical efficacy of chemotherapy drugs, reduce the incidence of drug side effects, and improve the quality of life of patients.

2.3 Shenfu injection

Shenfu injection is mainly processed from the extracts of red ginseng and black aconite slices, and has the functions of rejuvenating yang and relieving adversity, replenishing qi and solidifying, strengthening the spleen and promoting blood. Modern pharmacological studies have shown that various active ingredients such as ginsenosides, ginseng polysaccharides and aconitine in Shenfu injection have obvious effects and advantages in promoting the proliferation of bone marrow stem cells and improving the microenvironment of bone marrow hematopoietic [15]. Ma Feng administered Shenfu injection Zusanli injection to 96 patients with chemotherapy for the prevention and treatment of side effects of chemotherapy. 48 cases in the observation group received Shenfu injection Zusanli injection while undergoing chemotherapy, starting 1 day before chemotherapy and ending with chemotherapy At the end, once a day, the two groups of bone marrow suppression, immunity and quality of life changes were compared and analyzed. The results showed that the white blood cells of the observation group increased significantly after chemotherapy, and the platelets and hemoglobin also increased. The observation group The rate of improvement in the quality of life of patients (70.83%) was significantly increased, and the rate of decline in quality of life (6.25%) was significantly reduced, indicating that Shenfu injection Zusanli injection treatment can effectively prevent bone marrow suppression in cancer patients after chemotherapy and improve the quality of life of patients [16].

2.4 Astragalus Polysaccharide Injection

Astragalus polysaccharide is the main active substance of Astragalus. It has multiple biological effects, mediates a variety of body fluids and cellular immunity, can improve the phagocytic function of the reticuloendothelial system, enhance the ability of T, NK, LAK cells, and promote IL-22, TNF and other cytokines The production of serotonin can improve the body’s immunity; at the same time, it can induce tumor cell apoptosis by regulating tumor apoptosis genes, apoptosis-related signal molecules, regulating cell cycle and other mechanisms, and has a significant inhibitory effect on tumor cells. Wu Chengjun used astragalus polysaccharide intravenous infusion combined with chemotherapy to treat patients with advanced gastric cancer, and found that astragalus polysaccharide can activate T lymphocyte subsets/enhance the activity of NK cells, improve immunity, and reduce the side effects of chemotherapy such as bone marrow suppression [17].

2.5 Compound Kushen Injection

The compound Sophora flavescens injection is an intravenous preparation made by processing and extracting various Chinese herbal medicines such as Sophora flavescens, Smilax glabra, Shanci Guling, Wulingzhi, Polygonum multiflorum, etc. through modern technology. It has the effects of clearing away heat and dampness, cooling blood and detoxification, dispelling masses and relieving pain. Modern pharmacological and clinical studies have shown that matrine, the main component of compound Kushen injection, can improve tumor cell host immune function, induce tumor cell differentiation and promote apoptosis, resist tumor invasion and distant metastasis, directly kill tumor cells, and inhibit tumors Drug resistance, inhibit tumor neovascularization, reduce radiotherapy and chemotherapy response and other effects. Meng Xiangyun used compound kushen injection combined with chemotherapy to treat patients with gastric cancer and found that it can improve the levels of tumor markers and inflammatory factors in patients, enhance the patient’s immune function, reduce the occurrence of adverse reactions, and has high efficacy and safety [18].

3. Discussion

At present, anti-tumor traditional Chinese medicine injections are divided into single injections and

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compound injections according to the composition of the drugs. Due to the different components of traditional Chinese medicine injections, the treatment conditions are also different. Some have anti-tumor effects, some are used as tumor adjuvant drugs, and they are used for symptoms of tumor patients or anti-tumor and increase efficacy and reduce toxicity [19]. After long-term clinical trials, the role of traditional Chinese medicine injection in the process of tumor treatment is obvious to all. Its mechanism of action can include: new therapeutic targets, fewer side effects, high bioavailability, rapid action and effective absorption of modern pharmaceutical preparations. The characteristics of convenient medicine follow the overall concept of the theoretical system of traditional Chinese medicine and play a good therapeutic effect. More and more data and studies have shown that traditional Chinese medicine injection can improve the clinical symptoms of patients, improve the quality of life, prolong survival, and enable many patients to achieve long-term "survival with tumors". This is the advantage of traditional Chinese medicine treatment. Traditional Chinese medicine injection has good development prospects. However, there are still many problems and shortcomings in the research of traditional Chinese medicine injection treatment: some research documents are of poor quality, lack of systematic standard research, and the evaluation of curative effect standards are not unified, which affects the popularization and application of relevant experience; the use of traditional Chinese medicine in injection ignores dialectics The principle of governance. Therefore, it is necessary to continue a large number of high-quality clinical studies in the future to provide more evidence for verifying the clinical efficacy and safety of traditional Chinese medicine injections. Evidence-based medicine is regarded as an important approach for standardized research on the treatment of lung cancer with traditional Chinese medicine injections, from empirical medicine to Evidence-based medicine transformation; through the combination of dialectics and disease differentiation to obtain a higher rate of tumor control. We must adhere to the professional ethics of medical staff, carry out research and education on the rational use of tumor therapy, and make contributions to the progress and development of human tumors. How to correctly and scientifically apply Chinese medicine injection to treat tumor patients is still a long-term exploration process. This article is only a personal summary, and I hope it will be of benefit to readers.

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