

# *Research Progress of Chinese Medicine in the Treatment of Myelosuppression after Chemotherapy for Malignant Tumours*

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**Abstract:** Malignant tumours are common diseases in oncology, with irregular lifestyles, smokers and drinkers being the most prevalent groups. The common clinical symptoms are local mass, pain, ulceration, bleeding and obstruction. Chemotherapy is a commonly used treatment for malignant tumours, but myelosuppression easily occurs after chemotherapy is still the biggest problem in current cancer treatment, and if there is no "adjuvant" measure, it will lead to the deterioration of the disease, so that chemotherapy fails. Therefore, this paper focuses on the research progress of Chinese medicine in the treatment of post-chemotherapy myelosuppression of malignant tumours, with a view to providing some referential suggestions for clinical treatment.

## 1. Introduction

The incidence of malignant tumours is increasing year by year, and has become the 1st cause of death among our residents [1], seriously threatening people's health. Chemotherapy is one of the main methods for treating malignant tumours in clinic, because there is no fundamental metabolic difference between normal cells and malignant tumour cells, so most anti-tumour drugs kill tumour cells and damage normal cells at the same time. And the damage to the faster proliferating bone marrow haematopoietic stem cells is the most significant, leading to a decrease in peripheral blood leukocyte-based whole blood cells, thus causing low immunity susceptible to infections, anaemia, and even bleeding and other serious adverse reactions [2], which often leads to the termination of chemotherapy and affects the effective treatment of tumours. With the development of modern biotechnology, western drugs against myelosuppression have been widely developed and applied. Modern medicine often focuses on a certain factor or link in the hematopoietic process. Therefore, there are significant individual differences and a lack of wholeness. Its main methods include: (1) Hematopoietic colony stimulating factor, mainly includes granulocyte colony stimulating factor, thrombopoietin, recombinant human interleukin-11, etc. However, such drugs can easily accelerate the consumption of hematopoietic stem cells, and long-term use in large quantities can lead to an increase in true red blood cells and a risk of developing diseases such as chronic myeloid leukemia. And it can stimulate the growth and metastasis of certain tumor cells, inhibit cellular immune function. (2) Component blood transfusion, but this treatment has strict indications and more side effects, such

as fever, blood-borne infection and other risks. (3) Blood-boosting drugs, such as lisinopril, shark liver alcohol, caffeic acid tablets, etc. , but such drugs have a slow stimulating effect on the haematopoietic system. (4) Others are small-dose hormone therapy, such as dexamethasone, but the efficacy is unreliable, the side effects are large, and it may stimulate tumour progression. And cord blood transfusion and embryonic stem cell transplantation are technically demanding and expensive, limiting their wide application. The characteristics of traditional Chinese medicine are holistic concept, diagnosis and treatment, starting from the whole, flexible addition and subtraction of prescriptions and drugs, supporting the right and anti-cancer, especially the use of blood nourishment, spleen strengthening and kidney tonic methods for the treatment of leukocyte lowering after tumour chemotherapy has achieved good clinical efficacy, especially the method of tonifying the kidney and regenerating the medulla oblongata, which not only can prevent and control leukocyte lowering after tumour chemotherapy, but also has a certain effect of inhibiting the growth of the tumour and has shown a good clinical advantage. Therefore, this paper analyses and summarizes the development trend of Chinese medicine treatment of post-chemotherapy myelosuppression by reviewing the relevant literature in recent years, with the therapeutic principles and methods of Chinese medicine as the main focus.

## **2. Myelosuppression after chemotherapy for malignant tumours**

### **2.1. Pathogenesis**

Human bone marrow cells have a very vigorous proliferation ability and their differentiation degree is low, so they are relatively sensitive to chemotherapeutic drugs. Due to the strong action of chemotherapeutic drugs, but often lack of specificity, while killing and inhibiting tumor cells, other normal cells and tissues of the human body also have different degrees of inhibition and damage, which leads to damage to the bone marrow microcirculation, resulting in the necrosis and apoptosis of bone marrow blood cells, and at the same time also affects the proliferation of haematopoietic stem cells as well as differentiation function, causing imbalance in haematopoietic regulation, which leads to a decrease in the number of peripheral blood cells. Reduction of peripheral blood cells. As the half-life of granulocytes is the shortest, the reduction of granulocyte lineage is especially obvious, and the reduction of leukocytes usually occurs first, followed by the reduction of platelets. Modern medical research has classified myelosuppression into 2 categories: acute bone marrow injury and latent bone marrow injury, and has pointed out that the senescence of haematopoietic stem cells is the main cause of induced bone marrow injury [3]. Haematopoietic stem cells possess the ability of self-renewal and maintenance, and chemotherapeutic drugs induce haematopoietic stem cells to undergo senescence, making their self-sustainability impaired, which further leads to a reduction in their reserves in the organism and the occurrence of latent myelosuppression, so that acute bone marrow injury usually occurs first in patients undergoing chemotherapy, and after acute bone marrow suppression occurs, it may even eventually develop into myelodysplastic syndromes [4]. Under homeostatic conditions, the haematopoietic stem cell reserve is reduced, but patients with residual bone marrow injury usually maintain normal blood cell counts for a longer period of time, leading to neglect of residual bone marrow injury, which is one of the causes of potential myelosuppression. Some studies have shown [5] that the pathological changes caused by myelosuppression due to radiotherapy are manifested by pathological changes in the bone marrow haematopoietic tissues, abnormalities in the function of haematopoietic stem cells, haematopoietic progenitor cells and the destruction of haematopoietic growth factors, as well as abnormalities in the proliferative cycle of the bone marrow cells, etc. The self-renewal ability of the haematopoietic stem cells is impaired when toxic chemotherapeutic drugs, which selectively act on the haematopoietic stem cells, are used, and the haematopoietic Progenitor cells are depleted by chemotherapeutic agents, which predisposes to potential myelosuppression.

Myelosuppression hinders the course of chemotherapy in patients with malignant tumours. Bone marrow is the place where all kinds of blood cells grow and develop, and myelosuppression is the destruction of haematopoietic stem cells to different degrees, which can occur in all systems of bone marrow haematopoiesis. Leukocytes and neutrophils have a shorter lifespan and are easily involved in myelosuppression, increasing the chance of concurrent bacterial and viral infections. Red blood cells and haemoglobin have a relatively longer lifespan, but also have a longer growth cycle. Once destroyed, it is difficult to recover quickly within a short period of time with the intervention of blood transfusion or haematopoietic stimulating factors. When the degree of anaemia worsens, the patient's tiredness, fatigue, pallor and other symptoms worsen. Thrombocytopenia will aggravate the tendency of cerebral haemorrhage, and multi-organ and tissue failure is a critical condition that is difficult to recover from.

## **2.2. Analysis of the etiology and pathogenesis of myelosuppression after chemotherapy for malignant tumours and principles of Chinese medicine treatment**

### **2.2.1. Etiology and pathogenesis**

There is no record of myelosuppression in ancient Chinese medicine, but modern Chinese medicine scholars attribute it to the categories of "deficiency labour", "blood labour" and "blood evidence" in Chinese medicine according to the clinical manifestations after chemotherapy, such as fever, dizziness, pallor, insomnia and dreaminess, dullness, nausea and vomiting, lumbar and knee soreness and weakness, fever and tendency to bleed, and body weakness. It is classified under the categories of "deficiency labour", "blood labour" and "blood evidence" in Chinese medicine. It is mainly due to the lack of innate endowment of positive qi, and the internal invasion of drugs and toxins after chemotherapy, which leads to the damage of internal organs and qi and blood, especially the damage of kidney essence and spleen and stomach, resulting in the disorders of spleen and stomach [2]. Chinese medicine shows that bone marrow suppression is mainly induced by the deficiency of internal organs, yin and yang disharmony, and deficiency of qi and blood caused by drug toxicity, and the onset of disease and liver, spleen, kidney, heart and other organs are very closely related, with "spleen and kidney deficiencies" as the core element [2]. Early scholars, Professor Jia Yingjie [6], believed that deficiency, toxicity and stasis run through the beginning and end of the course of cancer tumours, and that the three co-exist with each other, intertwine with each other, influence each other, and act as cause and effect of each other, and that "internal deficiency of positive qi, toxicity and stasis co-exist together" is the key to the pathogenesis of cancer tumours. Chemotherapy, as a kind of drug poison, catalyses the vicious circle of deficiency→toxicity, stasis→vulnerability, with deficiency of spleen and kidney and deficiency of qi and blood being the main causes. Chemotherapy, as a kind of drug poison, not only binds with cancer poison and aggravates the trend of poison gathering, but also aggravates the pathological process of stasis and toxicity and spleen and kidney deficiencies while treating malignant tumours by "fighting poison with poison". Scholars such as Hou Tianjun [7] believe that cancer patients are born with deficiency and deficiency of positive qi, because chemotherapy drugs are very toxic, while attacking cancerous toxins in the body, it makes the positive qi weaker, which depletes qi and injures blood. Therefore, the basic mechanism of bone marrow suppression caused by chemotherapy is that the drug poisons invade the body, damaging the qi and blood, and even depleting the essence of kidneys, and the qi deficiency does not have any way to promote the blood line for a long period of time, the deficiency in yin and blood is small, and the deficiency of yang generates internal cold, resulting in blood stasis in the bone marrow. The nature of the disease is mostly deficiency and cold, mainly closely related to the spleen and kidneys. Li Kexin [8] and others believe that chemotherapy can be regarded as an invasion of poisonous evils, which, while treating the tumour with poison, aggravates the pathological

process of poison and stasis, and leads to damage of internal organs, qi and blood, especially the spleen and stomach disorders and the depletion of renal essence, and therefore produces a variety of pathological changes that lead to other illnesses. It can be seen that in addition to the deficiency of positive qi, cancer toxicity of the tumour itself and the toxicity of chemotherapeutic drugs, blood stasis is also an important and critical pathogenic factor and pathological product of myelosuppression after chemotherapy. Qin Li [9] et al. believed that chemotherapy drugs would damage the spleen and stomach, causing difficulties in food and drinking water, decreasing decomposition and digestion, inability to discriminate between clear and turbid, and imbalance in the transport of essence and micro-substances, which would result in the lack of a source of qi and blood biochemistry, and the lack of new blood, and ultimately lead to the evidence of qi and blood deficiency in myelosuppression. Repeated use of chemotherapy drugs by patients can continuously damage the spleen and stomach, resulting in insufficient qi and blood. A long course of illness can damage the kidneys and lead to a decrease in the function of other organs. If qi and marrow are unable to produce blood, it can result in bone marrow suppression and decreased hematopoietic function. Therefore, the clinical research of domestic scholars shows that 80% of the lesions of patients with bone marrow suppression after chemotherapy for malignant tumours lie in the spleen and stomach, while the kidney and stomach account for about 70%, and the spleen and kidney account for about 90%, and the human body has correlation with the liver, lung, spleen and kidney. As for the evolution of the pathogenesis of myelosuppression, "deficiency of qi, blood, yin and yang" is the main feature, and some scholars have shown that the essence of myelosuppression is "deficiency of the spleen and kidney", with toxicity and stasis as the main pathological elements [10].

### **2.2.2. Analysis of Chinese medicine treatment principles**

Analysis from the perspective of Chinese medicine shows that in the process of myelosuppression treatment after chemotherapy for malignant tumours, the principles to be followed include: first, the principle of nourishing kidney essence. Secondly, strengthening the spleen and stomach. Third, the principle of tonifying qi and nourishing blood. Fourth, the principle of supporting and tonifying. Based on these basic principles, treatment can be carried out with Chinese herbal prescriptions alone or in combination with Chinese herbal prescriptions. Some clinical researchers in China mentioned that the treatment of myelosuppression after chemotherapy of malignant tumour by activating blood circulation and removing blood stasis was found to be accompanied by fibrin accumulation around the cancer cells, which is similar to the phenomenon of platelet agglutination. And the blood of malignant tumour patients shows hypercoagulable state, which provides theoretical basis for the treatment of activating blood circulation and removing blood stasis Chinese herbal prescription and has certain scientific validity [11].

## **3. Prevention and treatment by traditional Chinese medicine**

### **3.1. Single-flavour Chinese medicine**

The traditional blood tonic method based on strengthening the spleen and nourishing the kidneys is based on the basic principle of enhancing and improving the haematopoietic function. Research was conducted after improving the biochemical toxicity of peripheral blood through *Agaricus blazei* and the efficacy of the drug after taking it. It was found that the administration of medication in conjunction with chemotherapy could significantly reduce the PLT decline caused and enable chemotherapy to proceed smoothly, thus improving the therapeutic effect and increasing the efficiency of drug therapy. It was shown that the total polysaccharide of the traditional Chinese medicine He Wu Su can improve peripheral blood recovery and significantly increase the expression

of splenic endostatin receptors and GATA-1 mRNA, which in turn improves the blood circulation in the leukaemia model [12].

### 3.2. Prescription compatibility

In the clinical treatment of myelosuppression after chemotherapy for malignant tumours, many scholars advocate the adoption of prescription compatibility in traditional Chinese medicine, which include: (1) Shiquan Dachuan Tang, which originates from the "Taiping Huimin Hejian Bureausquare". It can play the effects of both qi and blood, and play the effects of analgesia, antipyretic and anti-inflammatory. Some scholars in China have shown that the administration of Shiquan Daxin Tang to malignant tumours can reduce bone marrow suppression and improve the prognosis after chemotherapy [13]. (2) Angelica tonifying soup, which has the effect of tonifying qi and nourishing blood and exerts the efficacy of strengthening the spleen and supporting correctness, so that the bone marrow suppression can be effectively prevented and controlled, which in turn promotes the improvement of the prognostic effect of chemotherapy [14]. (3) Turtle and Deer Erxian Dan, which can exert the effect of both yin and yang tonic, is taken at night before bedtime to optimise the effect, protect platelets and leukocytes, and reduce the use of granulocyte-producing hormone to improve the prognostic effect of chemotherapy. (4) Self-designed traditional Chinese medicine formula can be taken to self-designed Sangzhen Nourishing Rong Tang formula, the main formula includes Sangsheng, Chasteberry, Huangjing, Coix seed, Chicken-blood vine, White-flower Snake Tongue Herb, Smallpox pollen, Ophiopogon, Codonopsis pilosula, Astragalus as well as Xianhecao, and so on. Myelosuppressive therapy for malignant tumours after chemotherapy can lead to an elevation in the number of white blood cells, which in turn leads to an improvement in the prognostic effect of chemotherapy [15]. Another study showed that patients were treated with Bazhen Tang in the process of receiving chemotherapy, and the blood composition did not change significantly after the treatment, and the results showed that Bazhen Tang had a certain protective effect on the haematopoietic function [16]. And Right Angelica Pill is to improve the function of the gastrointestinal tract as the main mechanism of action to inhibit the myelosuppression of patients after chemotherapy [17]. And after a number of Chinese medicine experts clinically came up with a kind of Chinese herbal medicine named Gui Zhi Paeoniae for cancer patients, it was found that Gui Zhi Paeoniae had a very good therapeutic effect, which could significantly reduce haemoglobin and platelets, so that the quality of survival of patients was greatly improved, and the therapeutic effect was better [18].

### 3.3. Proprietary Chinese medicines

Through the research on the treatment of myelosuppression caused by malignant cell carcinoma, experts have found that proprietary Chinese medicines can reduce the incidence of myelosuppression, shorten the time of myelosuppression recovery, and also have superiority in the treatment of thrombocytopenia and anaemia. According to the current status of research, it can be seen that it mainly includes: (i) ginseng and ginseng saponin injection, with ginseng saponin and alkaloids as the main ingredients, which can exert the effect of benefiting qi and fixing dehiscence, and it can make the bone marrow suppression after the chemotherapy of malignant tumour be effectively improved. At the same time, it can make the white blood cell data during chemotherapy decrease and make the haemoglobin count and platelet hormone increase. Comparing with granulocytopenin, this proprietary medicine has a better effect on the protection of human white blood cells, and at the same time, the application of the efficacy is more significant in the case of increased cycles of chemotherapy. (ii) Ginseng and wheat injection, maitake polysaccharide, maitake flavonoids, ginsenosides, trace ginseng polysaccharides and so on as the main ingredients. Ginsenoside can make

the expression of protease decrease, so that breast cancer cell apoptosis is induced by the action, and then make the myelosuppression situation after chemotherapy be effectively improved, and make the recovery of haematopoietic function speed up [19]. (iii) Diyu Lianbai Tablet, Diyu, saponin as the main ingredients, the Chinese patent medicine can promote the recovery of peripheral blood, so that platelets, white blood cell levels, so that the differentiation of haematopoietic cells, proliferation is effectively promoted. And the drug is safe to use and can make effective improvement of bone marrow suppression after chemotherapy for malignant tumours [20].

### **3.4. External treatments: Acupuncture and moxibustion therapy**

In addition to the above Chinese herbal tonics and proprietary Chinese medicines, for myelosuppression after chemotherapy for malignant tumours, clinical scholars have also indicated that TCM acupuncture therapy and moxibustion therapy can be adopted for treatment. Among them, acupuncture therapy is mainly based on the theory of meridians and acupoints, and is categorised into two major types: moxibustion and acupuncture. As the basis, it is classified into two categories: moxibustion and acupuncture. In the process of acupuncture and moxibustion treatment, doctors mainly choose the acupoints of the kidney and spleen meridians to play the role of tonifying. At the same time, doctors mainly implement tonifying techniques to effectively activate the body's meridians, exerting the effects of tonifying kidney essence and nourishing qi and blood. Early scholars Wu Yong [21] observed the evaluation of the efficacy of acupuncture in the treatment of myelosuppression after chemotherapy for tumours, and the results of the study showed that both acupuncture and spaced epiphyllum cake moxibustion can effectively improve the peripheral white blood cell counts of patients with myelosuppression after chemotherapy, with the onset of the effect time and the maintenance time of the two groups being comparable; the two groups of treatments are able to improve the patients' general physical condition and clinical symptoms of traditional Chinese medicine, alleviate the toxic and side-effects of chemotherapy, and improve the patients' quality of life. Wang Jue [22] et al. conducted clinical observation on the adjuvant treatment of myelosuppression after chemotherapy in patients with colorectal cancer by Guolu Erxian Gum Babu, and their results showed that the adjuvant treatment of Erxian Gum Babu improved the myelosuppression of patients with colorectal cancer undergoing chemotherapy to a certain degree, and no adverse reactions were found related to it. Wang Jiannan [23] and others carried out clinical observation on the protective effect of spacer moxibustion on myelosuppression during chemotherapy for gastric cancer, and the results showed that spacer moxibustion could effectively alleviate the myelosuppression caused by chemotherapy, alleviate the accompanying clinical symptoms to a certain extent, and improve the quality of life of the patients. Zhang Ying [24] and others performed clinical observation of 45 cases of leukopenia after chemotherapy for malignant tumours by moxibustion on the dorsal part of the ducal vein. The conclusion is that moxibustion on the back of the duchenwu vein is used for the adjuvant treatment of myelosuppression after chemotherapy in patients with advanced malignant tumours, and it has the effect of assisting the granulocyte colony-stimulating factor in elevating leukocytes, and it can make the leukocytes rise steadily and stabilise them in the normal range in a long time, and it has a rapid elevating effect on platelets, and it has a good therapeutic effect for the decline of leukocytes and mild thrombocytopenia after chemotherapy, and it is worthwhile to promote the application of it in clinic. Yang Jia'en [25] observed the clinical results of warm acupuncture for the treatment of post-chemotherapy leukopenia, which showed that warm acupuncture Guanyuan, Qihai, Ashisanli (double), and Diaphragm Yu (double) points could effectively reduce the bone marrow suppression caused by chemotherapy drugs, inhibit the decline of leukocytes after chemotherapy, alleviate the clinical symptoms, and the therapeutic effect was reliable.

### 3.5. Moxibustion therapy

Moxibustion therapy can play the effect of warming and dispersing cold condensation and warming and tonifying yang qi. Adopting intermittent garlic moxibustion or intermittent ginger moxibustion can play the effect of warming and stimulate the blood production of the human skeleton and improve the suppression of bone marrow. The most common points are Zusanli, Guanyuan and Dazhui, followed by Pishu, Shenshu, Xuehai, Geshu, Sanyinjiao and Qihai. It has been shown that Guanyuan and Zusanli were chosen most frequently and were used as a matching combination in studies on the effects of moxibustion on immune function. Both focus on strengthening the spleen and qi, warming the yang and tonifying the kidneys, and focus on Back-shu points, confluent points, and Mu points. Chinese medicine believes that the large vertebrae point is the meeting of all yangs, which can warm yang and open the veins. Back-shu points are not only the Yang meridian points, but also the five viscera and six bowels of the gas infusion point, take it can be warmed to replenish the gas, warm viscera and vital energy. Zusanli is the stomach meridian joint point, is to strengthen the spleen and stomach, biochemical blood, through the meridians and vitality of the key points, Zusanli point is the human body health care point. Taking the liver and kidney meridian acupoints is intended to benefit the essence and fill the marrow, nourish the essence and blood, moisten the internal organs, and consolidate the essence and cultivate the vitality.

#### 3.5.1. Moxibustion alone

Ji Yajie et al [26] observed the effects of moxibustion on white blood cell counts, neutrophil counts, and myelosuppression grading in breast cancer patients with myelosuppression after chemotherapy, and found that white blood cells were significantly higher in the treatment group than the control group in the seventh course of chemotherapy, and the degree of reduction of neutrophils was lower than that of the control group ( $P < 0.05$ ), and moxibustion was effective for patients with high-dose, long-term, and combination chemotherapy. Lu Mei et al [27] observed the effect of moxibustion on the expression of No.1 and No.2 Notch signalling pathway related differential genes No.1 and No.2 in bone marrow haematopoietic cells of healthy mice after cyclophosphamide chemotherapy. In this study, mice were divided into healthy group, model group and moxibustion group, and Dazhui, Shenshu, Geshu and Zusanli were selected for moxibustion, and the results showed that leukocyte rebound of mice after treatment in moxibustion group was earlier and greater than that of control group, while No.1 and No.2 were up-regulated, and the difference was significant compared with that of model group. Du Pengpeng [28] conducted a clinical study on moxibustion to improve leukocyte levels and adverse reactions in 48 cervical cancer patients after chemotherapy, the study was divided into an observation group and a control group, 24 cases in each group. In the control group, conventional leucocyte-boosting drugs were used, such as shark liver alcohol and Ricocoon tablets, and psychological counselling was provided to the patients, who were instructed to massage the relevant acupoints. In the observation group, moxibustion was applied on both sides of the feet on the basis of the moxibustion box, and the results showed that the white blood cell level of the observation group was significantly higher than that of the control group in the first and third weeks of treatment, and the incidence of adverse reactions was statistically significant compared with that of the control group. Xiao Xianhui et al [29] used moxibustion Zusanli to treat myelosuppression caused by chemotherapy in 97 cases of extensive-stage small-cell lung cancer, and the control group used the conventional chemotherapy regimen: etoposide+carboplatin. In the observation group, mild moxibustion was performed on the patients' bilateral Zusanli, and supportive therapies such as hepatoprotection and gastroprotection were adopted in both groups during the treatment process. The results showed that, except for the comparison of haemoglobin between the two groups on the 7th day of treatment, the difference was not statistically significant, and all the remaining indexes of the

control group were lower than those of the observation group, and the incidence of myelosuppression was significantly higher than that of the observation group, proving that moxibustion was indeed able to effectively reduce the myelosuppression of tumour patients and its incidence. Zhang Daifei et al. [30] used moxibustion at four flower points (diaphragm, gallbladder) to treat 60 cases of non-small cell lung cancer with bone marrow suppression. The clinical results showed that the white blood cell, haemoglobin and neutrophil counts of the moxibustion group were higher than those of the chemotherapy group, but there was no significant difference in the changes of platelets, which proved that moxibustion could alleviate the myelosuppression caused by chemotherapy to a certain extent.

### **3.5.2. Compartmentalised moxibustion**

Lin Wanbing et al [31] used spacer ginger moxibustion to treat 44 cases of myelosuppression caused by chemotherapy for multiple myeloma, in which the control group took white blood-boosting western drugs orally, and the observation group selected 2 groups of acupoints to apply spacer ginger moxibustion alternately, and the acupoints were selected from the Dazhui, Geshu, Pishu, Weishu, Shenshu, and Guanyuan, Qihai, Zusanli and Sanyinjiao. The results showed that the effective rate of the observation group (81.8%) was much higher than that of the control group (63.6%), and the white blood cell counts were higher in the observation group than in the control group at the 7th and 14th days of treatment, which effectively proved that interstitial ginger moxibustion was effective in alleviating the bone marrow suppression after chemotherapy and improving the quality of life after chemotherapy. Yan Yutai et al [32] observed the effect of moxibustion on the quality of life of patients with advanced hepatocellular carcinoma by using spaced ginger moxibustion therapy, and the clinical efficacy showed that moxibustion was superior to the conventional clinical treatments (antiemetic, analgesic, etc. ), and it had a better regulating effect on the patients' immune cells, which was able to improve the patients' immune function and improve the quality of life.

### **3.5.3. Moxibustion combination therapy**

Early scholars Zhang Chunying and Wu Zhongfang [33] clinically used spaced ginger moxibustion combined with recombinant human G-CSF compared with simple western medicine to explore the efficacy of moxibustion on myelosuppression after chemotherapy, clinical results show that the use of moxibustion combined with western medicine treatment of patients with white blood cells, platelets, haemoglobin and so on in the treatment of the treatment has been significantly improved, and in the treatment of the group is significantly better than the simple western medicine. Subsequently, Zhang Lanhui et al [34] used moxibustion combined with angelica blood replenishing soup to treat patients with myelosuppression, 31 cases in each of the observation and control groups were given docetaxel combined with cisplatin chemotherapy. Patients in the observation group were selected to be given mild moxibustion treatment with Guanyuan, Dazhui, Zusanli, Shenshu and Pishu, as well as oral administration of Angelica sinensis blood tonic soup two times in the morning and evening for 28 days, while the control group was given recombinant human G-CSF treatment. Except for haemoglobin, which had no significant change, the rest of the indexes of the observation group increased significantly after treatment, and the difference was statistically significant compared with the control group, and the functional status score and the incidence of adverse reactions were better than that of the control group. The results suggest that the effect of moxibustion is not only similar to that of recombinant human granulocyte colony-stimulating factor, but also improves the quality of life of patients after chemotherapy. Xiao Caizhi et al [35] observed the therapeutic effect of 80 cases of tumour patients in the clinic, the control group was treated with conventional chemotherapy, and the observation group was treated with traditional Chinese medicine paste with moxibustion on the basis of the control group. The results showed that moxibustion combined with traditional Chinese



medicine paste could effectively reduce the occurrence of myelosuppression after chemotherapy, reduce the use of clinical chemotherapeutic drugs, and have no obvious adverse reactions.

#### 4. Summary

In summary, traditional Chinese medicine has significant advantages in the prevention and treatment of leukemia. Although it has been confirmed that traditional Chinese medicine has shown significant effectiveness in preventing and treating bone marrow suppression caused by chemical drugs, but physicians still need to adopt personalized treatment plans based on factors such as disease progression and individualized differences. At the same time, it is necessary to reasonably select traditional Chinese medicine decoction, acupuncture therapy, moxibustion therapy and etc, which will effectively improve the efficacy and safety of treatment, and ensure the improvement of prognosis and quality of life.

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