

Analysis of the Progress of Chinese Medicine Treatment of Hyperthyroidism

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Abstract: Hyperthyroidism is a common endocrine disorder, a state of hypermetabolism due to overproduction of thyroid hormone (Thyroid Hormone). Traditional treatments include antithyroid drugs, radioactive iodine therapy, and surgical resection; however, these methods may be accompanied by a number of side effects and limitations. In recent years, herbal therapy has received much attention as an alternative approach, and its potential efficacy and relatively few adverse effects have attracted the interest of researchers. In this review, we will analyze the progress of Chinese medicine treatment for hyperthyroidism and discuss its mechanism, efficacy, and future trends.

1. Introduction

Hyperthyroidism is a common endocrine disorder characterized by overproduction of thyroid hormones (T3 and T4), resulting in hypermetabolism of the body and clinical symptoms including palpitations, excessive sweating, weight loss, anxiety, and fatigue. The main causes of this disease are autoimmune thyroid disease (Graves' Disease) and toxic thyroid adenoma. Conventional treatments have some limitations, such as long-term use of antithyroid medications that may lead to drug dependence and adverse reactions, radioactive iodine therapy that may trigger hypothyroidism, and surgical resection that is accompanied by surgical risks and postoperative complications. Therefore, researchers have been seeking alternative treatments, among which herbal therapy has attracted wide interest as a potential option.

2. Study on the mechanism of Chinese medicine in the treatment of hyperthyroidism

2.1. Inhibits thyroid hormone synthesis

A key mechanism in the treatment of hyperthyroidism with herbal medicine is the regulation of thyroid function by inhibiting thyroid hormone synthesis. Overproduction of thyroid hormones (T3 and T4) is one of the main causes of hyperthyroidism. Some ingredients in traditional Chinese medicine, such as the extract of parasitic herb in Dokuro Parasite Soup, have been shown in studies to have the effect of inhibiting thyroid hormone synthesis. These ingredients may reduce the synthesis and release of thyroid hormones by affecting the hormone secretion regulation pathway of the thyroid gland, thus lowering the level of thyroid hormones in the body.

By inhibiting the synthesis of thyroid hormones, traditional Chinese medicine can effectively reduce the hypermetabolic symptoms of hyperthyroidism in patients with hyperthyroidism, including palpitations, excessive sweating and weight loss^[1]. The understanding of this mechanism provides an important scientific basis for the treatment of hyperthyroidism with Chinese herbs, which is expected to provide a safer and more effective treatment option for patients.

2.2. Reduction of thyroid autoimmune inflammation

One of the pathogenic mechanisms of hyperthyroidism is the inflammatory response associated with autoimmunity, especially in autoimmune thyroid disorders such as Graves' disease. One of the important mechanisms of herbal therapy is to reduce the degree of thyroid autoimmune inflammation. Some herbal ingredients, such as *Salvia miltiorrhiza*, *Astragalus membranaceus*, and *Trigonella foetida*, are believed to have anti-inflammatory effects. They can reduce the inflammatory response of thyroid tissue by inhibiting the release of inflammatory mediators and modulating the activity of immune cells^[2]. This anti-inflammatory mechanism reduces inflammation-induced thyroid tissue damage and helps maintain normal thyroid function.

By reducing the autoimmune inflammation of the thyroid gland, herbal therapy can not only improve the symptoms of patients, but also reduce the severity of the disease and lower the risk of progression of autoimmune thyroid disease. The understanding of this mechanism provides an important biological basis for the use of herbal medicine in the treatment of hyperthyroidism.

2.3. Modulation of immune function

Hyperthyroidism is closely related to disorders of the immune system, in which autoimmune reactions play an important role in the pathologic process. Another important mechanism in the treatment of hyperthyroidism with Chinese medicines is to influence the progression of the disease by regulating the immune function. Some Chinese herbal components, such as ginseng, astragalus and bittersweet, have been studied and proved to have immunomodulatory effects. They can adjust the activity and differentiation of immune cells and reduce the over-activation of autoimmune responses^[3]. This modulating effect helps to reduce the severity of autoimmune thyroid disease, decrease the attack of the immune system on thyroid tissue, and reduce symptoms and inflammatory responses.

By modulating immune function, herbal medicines can help balance the activity of the immune system, preventing further thyroid tissue damage while alleviating the patient's discomfort. The understanding of this mechanism provides a scientific basis for the use of Chinese herbs in the treatment of hyperthyroidism, and is expected to provide patients with a therapeutic modality that assists in regulating the immune system.

2.4. Improvement of symptoms

First of all, some of the ingredients in the herbal medicine have been found to have the effect of inhibiting the synthesis of thyroid hormones. By reducing the synthesis and release of thyroid hormones T3 and T4, this mechanism effectively reduces the level of excessive thyroid hormones in the body and helps to alleviate the hypermetabolic symptoms of patients. Secondly, the pathogenesis of hyperthyroidism is closely related to autoimmune-related inflammatory reactions. Herbal medicines work in this regard by reducing the degree of autoimmune inflammation of the thyroid gland. Some components in Chinese medicines, such as *Salvia miltiorrhiza* and *Astragalus*, have anti-inflammatory effects, which can reduce the inflammatory response of thyroid tissues by inhibiting the release of inflammatory mediators and regulating the activity of immune cells, and

help to maintain normal thyroid function^[4]. In addition, Chinese herbs can also regulate the function of the immune system. Some constituents, such as ginseng, astragalus, and bittersweet, are believed to have immunomodulatory effects that help balance the activity of the immune system, reduce the severity of autoimmune thyroid disease, and attenuate the attack of the immune system on thyroid tissue. Finally, herbal medicines also play an important role in improving clinical symptoms in patients with hyperthyroidism. Certain herbal ingredients have sedative and neuromodulatory effects, helping to reduce symptoms such as anxiety, palpitations and insomnia.

3. Evaluation of the clinical efficacy of traditional Chinese medicine in the treatment of hyperthyroidism

3.1 Application of Chinese medicines in single or compound formulas

Evaluation of the clinical efficacy of herbal medicines in the treatment of hyperthyroidism has attracted extensive research interest. Among them, the application of single or compound prescriptions of traditional Chinese medicine has occupied an important position in clinical practice.

Among the applications of single or compound Chinese herbal formulas, traditional Chinese herbal formulas, such as Duo Wu Zhi Sheng Tang, Chai Hu Qing Liver Tang, and Huang Qi Wan, have been widely used in the treatment of hyperthyroidism. These herbal formulas often contain multiple herbal components with multiple pharmacological effects. Clinical studies have shown that these herbal formulas can effectively reduce the level of thyroid hormones, alleviate the symptoms of hypermetabolism and improve the quality of life of patients. Especially for some patients who are not sensitive to or cannot tolerate traditional treatments, the application of single or compound herbal formulas shows unique therapeutic potential^[5]. In addition, Chinese herbal formulas are often used in combination with traditional treatments (e.g., Antithyroid Drugs) in the clinic to achieve better therapeutic effects. This combined therapeutic strategy can reduce the dose and adverse effects of antithyroid medications while alleviating patient symptoms and improving efficacy.

Although the application of Chinese herbal medicines in single or compound formulas has shown some efficacy in the clinic, more large-scale clinical trials are needed to validate their therapeutic efficacy and safety. In addition, individualized treatment is also a trend for future research to better meet the needs of different patients and to provide more precise solutions for the herbal treatment of hyperthyroidism. Overall, the application of Chinese herbal medicines in single or compound formulas offers a promising option for the treatment of hyperthyroidism, but it must be used under the guidance of a medical professional to ensure the safety and efficacy of the treatment.

3.2 Application of Chinese medicine in combination with traditional treatment

The treatment of hyperthyroidism usually involves a variety of approaches, with herbal medicine combined with traditional treatment becoming an increasingly popular treatment strategy. This combination therapy approach combines herbal and traditional treatments with the aim of improving efficacy and minimizing adverse effects.

The use of herbal medicines in combination therapy can have the following benefits:

First, Chinese herbs have the ability to inhibit the synthesis and release of thyroid hormones, which can assist traditional treatments, such as antithyroid medications, in reducing symptoms and restoring normal thyroid function. This synergistic effect can reduce the dose of medication required for traditional treatments and reduce the risk of adverse reactions in patients. Second, herbs have anti-inflammatory and immunomodulatory effects that can reduce disease progression caused by autoimmune inflammation of the thyroid. Used in combination with traditional treatments,

traditional Chinese medicine can help reduce the severity of autoimmune thyroid disease and reduce the attack of the immune system on thyroid tissue^[6]. In addition, herbal medicines can improve the quality of life of patients. Many patients with hyperthyroidism are often accompanied by symptoms such as anxiety, palpitations, and insomnia, and the sedative and neuromodulatory effects of traditional Chinese medicines can help to alleviate these discomforts and improve patients' psychological health.

Although the application of Chinese herbal medicine in combination with traditional treatment presents many potential advantages, comprehensive assessment and guidance from clinicians are still needed before treatment. In addition, more large-scale clinical trials are needed to confirm the exact effects and safety of TCM in combination therapy^[7]. Taken together, the application of traditional Chinese medicine combined with traditional therapy offers a promising approach to the comprehensive treatment of hyperthyroidism, which is expected to improve patients' outcomes and quality of life.

4. Safety and adverse effects of traditional Chinese medicine in the treatment of hyperthyroidism

Herbal remedies for hyperthyroidism are often considered to have relatively low adverse effects compared to conventional treatments. However, herbal medicines are not without risk, especially if purchased and used on their own. Some possible adverse reactions include:

4.1 Allergic reaction

Although herbal treatment of hyperthyroidism has demonstrated good efficacy in some patients, there are certain risks, mainly in the form of possible allergic reactions to herbal ingredients in some patients. These allergic reactions include symptoms such as rash, urticaria, and dyspnea.

The occurrence of allergic reactions may be related to individual differences in patients, the sensitivity of the immune system, and the quality and purity of the herbal ingredients. Therefore, clinicians should take a careful look at the allergy history of patients and conduct adequate allergy testing before the initiation of herbal therapy to ensure the safety of herbal therapy. For patients who develop allergic reactions, TCM treatment should be stopped immediately and appropriate medical measures, such as anti-allergic drugs and emergency resuscitation, should be taken to minimize the risk and ensure patient safety^[8]. Therefore, it is important to be vigilant about potential allergic risks to ensure the effectiveness and safety of herbal therapy.

4.2 Indigestion

During the herbal treatment of hyperthyroidism, patients may experience dyspeptic symptoms such as nausea, vomiting, and diarrhea if the herbs are not properly dosed or used in the correct manner. These symptoms are usually related to the irritation or burden of the herbal ingredients on the gastrointestinal tract.

To prevent dyspepsia, clinicians should carefully adjust the dosage of Chinese herbal medicines precisely according to the patient's condition and physical characteristics when prescribing. At the same time, patients should use Chinese herbal medicines in strict accordance with the doctor's prescription and pay attention to dietary hygiene and drinking sufficient water in the course of medication in order to alleviate gastrointestinal discomfort.

In the course of Chinese medicine treatment, if obvious symptoms of indigestion appear, patients should report to the doctor in time so that the doctor can make dosage adjustments or take other appropriate therapeutic measures. The occurrence of dyspepsia can be effectively reduced through

rational medication and close monitoring to ensure the smooth progress of Chinese medicine treatment^[9]. Therefore, close cooperation between doctors and patients is essential for the prevention and management of dyspepsia.

4.3 Drug interactions

Special attention needs to be paid to potential drug interactions when treating hyperthyroidism with herbal medicines. The active ingredients in herbal medicines may interact with other medications and affect their efficacy or safety. Therefore, when using herbal medicines, it is important for physicians to take a careful look at the patient's medication history, including the use of prescription and over-the-counter medications as well as supplements^[10].

Drug interactions may result in higher or lower drug concentrations, which may increase the risk of adverse effects or decrease therapeutic efficacy. In the treatment of hyperthyroidism with herbs, physicians should select appropriate herbs based on the patient's medication history and monitor the patient's therapeutic response in order to make timely adjustments to the treatment regimen.

Patients should also actively cooperate with their physicians by informing them of all medications being used, both herbal and non-herbal, to ensure that the physician can fully assess the risk of potential drug interactions. The risk of drug-drug interactions can be minimized through careful drug use and effective medical monitoring to ensure patient safety and therapeutic outcomes^[11].

5. Future Development Trends

The potential of herbal medicine for the treatment of hyperthyroidism, although still in its infancy, has generated widespread interest. Future trends include several key aspects. First, more large-scale clinical trials will be conducted to validate the efficacy and safety of herbal treatments and to provide stronger evidence for the use of herbal medicines in the treatment of hyperthyroidism. Second, TCM therapy requires stricter drug standardization and quality control to ensure consistency and credibility of treatment. In addition, individualized treatment will become a future trend, allowing physicians to precisely adjust the TCM treatment plan according to the patient's specific situation in order to improve therapeutic efficacy and reduce unnecessary discomfort and risk. Finally, further research on the mechanism of action of TCM in the treatment of hyperthyroidism is crucial to help better understand its efficacy and advantages and provide a more scientific basis for TCM treatment. Overall, TCM treatment of hyperthyroidism is expected to become an important therapeutic option in the future, providing patients with a safer and more effective treatment modality.

6. Conclusion

Hyperthyroidism is a common endocrine disorder with some limitations and adverse effects associated with conventional treatments. Herbal therapy has attracted widespread research interest as an alternative approach with potential efficacy and relatively few adverse effects. Although more clinical studies are needed to validate its efficacy, mechanistic studies, clinical efficacy assessment, and future trends in the treatment of hyperthyroidism with Chinese herbal medicine suggest its potential. Chinese medicine treatment provides another option for patients, but the use of Chinese medicine should be guided and monitored by specialized physicians to ensure the safety and efficacy of the treatment.

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