

Traditional Chinese Medicine Interventions in AIDS Immune Reconstruction under Public Health Supervision

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Abstract: This paper summarizes the results of Traditional Chinese Medicine (TCM) intervention in Acquired Immunodeficiency Syndrome (AIDS) treatment from the immune reconstruction. The role of TCM in intervening in AIDS immune reconstruction, improving the symptoms of HIV/AIDS patients, improving the quality of life of patients, and alleviating the suffering of patients were thoroughly analyzed. Specifically, this paper uses a retrospective analysis method to divide 187 AIDS patients into a simple western medicine group and a combined Chinese and western medicine group according to whether the treatment plan is combined with TCM. The medical records of the patients in the included group were classified and analyzed based on the follow-up points before treatment, 12, 24, and 36 months after treatment, to observe the change in total symptom score, CD4+ lymphocyte count, and the Karnofsky score.

The results demonstrate that the total symptom scores in the western medicine group after treatment were lower than those before treatment, and the decrease in the 12th and 24th months was statistically significant compared with that before treatment ($P < 0.05$), while the decrease in the 36th month was lower than that before treatment with no statistical significance ($P > 0.05$). Compared with those before treatment, the total symptom scores in the combined group were significantly lower at each follow-up point (P value < 0.05), and the decrease at the 24th and 36th months was more significant than that in the western medicine group at the same period ($P < 0.05$). In addition, the CD4+ counts at each follow-up point in the two groups were significantly increased compared with those before treatment ($P < 0.05$), and the increase in the combined group at the 36th month was significantly more significant than that in the western medicine group at the same period ($P < 0.05$). Moreover, the Karnofsky score of the western medicine group decreased compared with those before treatment except for the 12th month, and there was no significant difference at each time point ($P > 0.05$). On the other hand, the scores for the combined group increased after treatment compared with before treatment. The differences were statistically significant ($P < 0.05$) except for the 12th month, and the difference presented in the 24th and 36th months, contrasting with the western medicine group at the same period, were significant Statistically significant ($P < 0.05$).

We concluded that: 1. Western medicine treatment and combined treatment of traditional Chinese and Western medicine can improve the symptoms score of patients, promote the growth of CD4+ lymphocytes, and mediate immune reconstruction. The long-term curative effect of combining traditional Chinese and western medicine is more effective, durable and stable. 2. Combined use of traditional Chinese and Western medicine effectively relieves patients' pain and improves their quality of life. 3. Long-term application of traditional Chinese medicine combined with HARRT has an effectively synergistic effect and promotes the treatment of AIDS patients.

1 INTRODUCTION

1.1. Definition of Immune Reconstitution

Immune reconstitution is a non-specific immunotherapy that restores the body's immune function and reverses immune damage through various means, thereby reducing

the harm of the virus to the human immune system [1]. Successful HIV immunity reconstitution usually means a steady rise in CD4+ counts to normal levels, improvement in clinical symptoms, and no apparent associated opportunistic infections and tumour formation (Abrams, Levy, Losso MH & et al, 2009). Carter et al. (2010) concluded that immune reconstitution is mainly through improving bone marrow hematopoietic function and increasing

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thymic output to enhance immunity. Another scholar found that maintaining T cell homeostasis and promoting T cell proliferation has an essential impact on immune reconstitution. HARRT is currently the primary method to treat AIDS, promote immunity reconstruction, improve immune function, and reduce mortality. Studies have confirmed that it can reduce immune damage and block virus proliferation to the greatest extent in any period of AIDS. The current recommendation is to perform HARRT as soon as HIV infection is diagnosed so that the virus can be intervened at an early stage, reduce the risk of transmission, and improve the health of the body.

1.2. Research on New Strategies for Immune Reconstitution

1.2.1. Bone marrow transplantation.

Bone marrow transplantation is a type of organ transplantation mainly used for diseases of the blood system and immune systems. It is a therapeutic method of transplanting diseased bone marrow with health bone marrow (Thaker & Snow 2003). A case was reported that by transplanting the bone marrow containing the mutant gene CCR5 Δ 32, one HIV-positive patient with leukemia was successfully treated, and there was no recurrence after five years of treatment. The reason may be that CCR5-deficient cells can resist HIV and promote the clearance of the virus, and bone marrow transplantation is expected to be a new way to cure AIDS. However, many scholars believe that CCR5 deficiency will affect the body's immune function, cause cancer cells, and increase the prevalence of other HIV strains. At present, standardized cultivation and quality control methods have not been introduced, and there is also a lack of extensive sample studies to confirm its mechanism of action, safety and efficacy.

1.2.2. Thymus transplantation

As an immune organ of the body, the thymus's output function has always been closely related to immune reconstruction. Studies have found that the thymus can export and synthesize T cells, promote T cell growth, and inactivate and inhibit HIV [10]. At the same time, the interleukin-7 (interleukin-7, IL-7) produced by it can regulate immunity and maintain T cell proliferation and homeostasis. Many scholars have carried out a series of related studies on the reconstruction of the immune function of HIV patients through thymus transplantation. However, problems such as the shortage of available organs and immune rejection still need to be solved urgently (Autran, Carcelain, Li & et al., 1997).

1.2.3. Cytokine therapy

Studies have confirmed that cytokines can regulate the function and survival of cells and improve the body's immune response. The use of cytokines as adjuvants in treating AIDS has become a research hotspot. Combining cytokines as supplementary therapy with HAART seems to

maximize drug utilization. If some studies have found that IL-7 can increase the count of CD4+ T cells, play an antiviral and activate the Immune effect, IL-2 can promote the proliferation of naive lymphocytes and improve the immune environment; IL-15 has the function of promoting adaptive immunity. However, some studies have also reported no significant difference in the mortality and infection rates between the combined subcutaneous injection of cytokines and antiviral therapy alone (Guihot, Bourgarit, Carcelain & et al., 2011).

1.2.4. Adoptive immunotherapy

Adoptive immunotherapy extracts the peripheral blood mononuclear cells of uninfected identical twins, transforms and proliferates them in vitro, and then injects them into the infected person, thereby helping the infected person to increase the differentiation of immune cells, resist viral infection, and achieve the purpose of immune repair. It is helpful for immune reconstruction. However, due to the considerable limitations of its clinical application objects, the curative effect is not yet apparent, and there is still some room for widespread application. In addition, various interventions such as reducing immune activation, AIDS vaccine, hormone therapy, organo-germanium polysaccharide, and gene editing also need further research and development (DANIYAL, AKRAM, HAMID & et al., 2016)

1.3. Limitations of HARRT - Mediated Immune Reconstitution

As a highly contagious sexually transmitted disease, AIDS has been raging worldwide for over a few decades, and now it has been gradually controlled under antiretroviral treatment. The practice has proved that HARRT, as a mainstream treatment program, has played an irreplaceable role in curbing the AIDS epidemic. However, it has certain limitations in the mediation of AIDS immune reconstitution. Some patients have minimal recovery of T lymphocyte levels after antiviral treatment or cannot return to normal, showing immune non-response phenomena and being unable to obtain good immune reconstruction (Kolte, Ryder, Albrecht-Beste & et al., 2009). The specific manifestations are as follows: 1. The virus cannot be eliminated, as only virus replication can be inhibited. The HIV reservoir can hide the virus for a long time or undergo structural mutations, and it is easy to wait for the opportunity to rebound; 2. The lack of targeted and individualized mediation of patients' immune reconstruction leads to differences in treatment effects. At the same time, the effect is unsuitable for some patients with low baseline levels, weak constitution, complex past medical history, severe disease or co-infection; 3. The effect of single-use is average, and long-term use is required, with high patient medication compliance requirements. Long-term use of antiviral drugs can easily lead to increased drug resistance and a series of adverse reactions, thus affecting treatment.

1.4. Understanding of TCM Scholars on AIDS Immune Reconstruction

Under the circumstance that AIDS is sweeping the world, China has actively applied and developed antiviral therapy and vigorously promoted traditional medicine to adapt to the development of the times, which has played a good role in preventing AIDS. In recent years, through continuous development and in-depth discussions (Kwarteng, Ahuno & Kwakye- Nuako, 2017), many studies have confirmed that traditional Chinese medicine is effective in killing infected immune cells, inhibiting and blocking virus replication, improving immunity, and reducing adverse reactions. It has significant application value in the prevention and treatment of AIDS. Jiang Feng et al. observed 91 AIDS patients, 41 cases in the Chinese and Western medicine group: Shenling Fuzheng Capsule + HARRT and 50 cases in the Western medicine group: HARRT. After six months of treatment, they found that: Shenling Fuzheng Capsule combined with HAART can increase HIV/AIDS. The patient's CD4+T count can reduce the CD8+T count simultaneously and, to a certain extent, increase the CD4+CD25+ and CD4+CD127+, thereby protecting and improving the body's immune function. Deng Lianbo et al. confirmed that honeysuckle, myrobalan and melon peel could be targeted to resist HIV and inhibit viral activity, and wolfberry can promote immunity. He Gang et al. found that Astragalus can increase the synergistic effect of HARRT therapy and shorten the course of poor immune reconstitution. Yang Guohong et al. found that Shenling Baizhu Powder has a good curative effect on AIDS-related diarrhea patients. Sun used tripterygium glycosides tablets combined with HAART to treat patients with poor immune reconstitution, and the results showed that the CD4+ count in the peripheral blood of the patients increased, and the level of T cell activation subsets decreased (Mendez-Lagares, Pozo-Balado, Genebat & et al., 2012), suggesting the effectiveness of tripterygium glycosides tablets in improving immune reconstitution. He Zhengzheng et al. found that Fuzheng Kangdu Pills can improve the clinical symptoms of HIV/HBV co-infected patients, protect CD4+ lymphocytes, and maintain the stability of liver function in patients. As the first Chinese patent medicine approved for AIDS treatment in China, Tangcao Pian has been effectively confirmed in terms of anti-oxidation, immune regulation, and symptom improvement, and it has good safety (Sabbatini, Bandera, Ferrario & et al., 2010).

2 EXPERIMENTAL RESEARCH

2.1 Experiment Design

According to the inclusion criteria, 148 patients were excluded, five died, 175 patients with data defects, and 157 patients with less than 36 months of treatment. Finally, inclusion criteria were selected. 187 HIV/AIDS patients. According to whether the treatment was combined with traditional Chinese medicine, the patients were divided into the Western medicine group and the combined Chinese and western medicine group. Among them were 71 cases in the Western group and 116 in the combined group.

①Western medicine group (n=71): conventional HARRT first-line treatment regimen, the main drugs are Tenofo (TDF)/Zidovudine (AZT) + Lamivudine (3TC) + Efavirenz (EFV) /nevirapine (NVP). ②Combined Chinese and Western medicine group (n=116): Based on the above scheme, according to the patient's symptoms, tongue and pulse, etc., TCM syndrome differentiation treatment was carried out. ①Total symptom score: refer to the symptom score standards in the clinical technology plan of the "Traditional Chinese Medicine Treatment AIDS Project" issued by the State Administration of Traditional Chinese Medicine. ②Karnofsky score: refer to the evaluation standard of Karnofsky score. ③Immune index: absolute count of CD4+ T cells in peripheral blood. This paper uses SPSS 23.0 statistical software for analysis. Measurement data were described by the mean plus or minus standard deviation, and a t-test was used when they were in line with normal distribution and had equal variances. Test level $\alpha = 0.05$, $P < 0.05$ indicates statistical significance.

2.2 Results

Total symptom scores in the Western medicine group decreased at each time point. Among them, the 12th and 24th months have differences statistically significant compared with before treatment ($P < 0.05$), and the decrease in the 36th month was not statistically significant compared with that before treatment ($P > 0.05$). Compared with those before treatment, the symptom score in the combined group was significantly lower at each time point ($P < 0.05$), and the decrease in the 24th and 36th months was significantly better than that in the western medicine group at the same period ($P < 0.05$),

Category	Number of examples (n)	0 month	0-12 months	0-24 months	0-36 months
Western Medicine	71	7.26±3.69*	4.71±3.69*	5.53±3.53*	6.19±4.05
Chinese and Western Medicine	116	8.04±5.18	4.82±3.46*	4.13±2.78*#	2.87±3.01*#

Note: Compared with this group before treatment, * $P < 0.05$; compared with the same period in the Western medical group, # $P < 0.05$

CD4+ counts in the Western medicine group and the Combined Chinese and western medicine groups were significantly increased compared with those before treatment (P

< 0.05), and the difference in the Combined Chinese and western medicine group was significantly bigger than that

in the Western medicine group at the same period ($P < 0.05$) at the 36th month.

Category	Number of examples (n)	0 month	0-12 months	0-24 months	0-36 months
Western Medicine	71	328.66±112.89*	366.21±102.04*	376.21±101.75*	382.58±107.97
Chinese and Western Medicine	116	346.60±123.55	392.41±106.84*	410.33±113.80*#	425.88±119.01*#

Note: Compared with this group before treatment, * $P < 0.05$; compared with the same period in the Western medical group, # $P < 0.05$

In the 12th month, the Karnofsky score of the western medicine group all decreased compared with those before treatment, and each time point was lower than before. The difference was not statistically significant ($P > 0.05$).

Compared with before treatment at each time point in the Combined Chinese and western medicine group, the differences were statistically significant except for the 12th month ($P < 0.05$).

Number of examples (n)	0 month	0-12 months	0-24 months	0-36 months
71	88.43±9.24*	89.21±8.20*	88.03±7.21*	87.05±8.78
116	86.76±9.68	88.23±7.31*	89.85±7.22*#	90.88±7.67*#

Note: Compared with this group before treatment, * $P < 0.05$; compared with the same period in the Western medical group, # $P < 0.05$

AIDS is an infectious disease ravaging the world. In recent years, modern and traditional medicine has undergone countless scientific research on AIDS, all of which have achieved specific curative effects. As an immunodeficiency disease, the recovery and reconstruction of immune function are crucial for disease progression and patient prognosis, and successful immune reconstruction is a hallmark of good clinical benefit. In order to determine the efficacy of AIDS immune reconstitution, modern medicine generally uses the recovery of CD4+ cell function and the increase in the number as the main signs. Traditional medicine adheres to the concept of treatment based on syndrome differentiation and the holistic concept and believes that the treatment of AIDS must be combined with the knowledge and understanding of modern medicine. Different syndromes and treatment methods should be established according to the clinical stage of the patient and the difference in disease location, disease nature, and disease severity. The evaluation of the efficacy of immune reconstruction should not be limited to the increase and decrease of CD4+ counts. Instead, we should adhere to a comprehensive analysis, grasp the overall changes in the condition, and focus on different aspects at different times. The subjective feeling and objective signs of HIV/ AIDS patients are specific reflections of the development of the disease. They are essential factors for evaluating whether the immune reconstitution is successfully established. As a reflection index of quality of life, Karnofsky score is also of great significance in evaluating the efficacy of immune reconstruction. The efficacy of traditional Chinese medicine intervention on immune reconstitution is generally evaluated by comprehensive analysis of CD4+ lymphocyte count, total symptoms score, and Karnofsky score.

3 CONCLUSION

AIDS is an immunodeficiency disease, and the success of immune function reconstruction is related to disease progression, prognosis and outcome. As the current mainstream treatment plan, HARRT has limitations such as the inability to remove the virus, low utilization rate of some drugs, prone to complications, and side effects, which can easily affect the treatment effect or cause treatment interruption. On the other hand, traditional Chinese medicine has been baptized for thousands of years and has played an indelible role in fighting against diseases and protecting people's health. In recent years, it has been widely used in AIDS treatment, and its clinical efficacy has also been verified. However, neither modern nor traditional medicine has been able to treat AIDS comprehensively. Therefore, combining traditional Chinese and Western medicine is an inevitable direction and focuses on breaking through the bottleneck of treatment, improving the curative effect, enriching the treatment methods, and finding new treatment strategies.

In this study, 187 HIV/AIDS patients were retrospectively analyzed, and the changes in immune indicators, symptom scores and life quality of patients were analyzed. After comparing the single use of Western medicine and the combined treatment of traditional Chinese and Western medicine, it is found that the latter has significantly better effects in improving symptoms, enhancing immune function, and maintaining long-term curative effects. It can accelerate and maintain the growth of immunological indicators, reduce symptoms and signs, improve the quality of life, and promote the recovery and reconstruction of immune function. For the treatment of AIDS, combining

traditional Chinese and Western medicine to synergistically enhance the efficacy, improve the success rate of immune reconstruction, and alleviate the limitations of the long-term application of HART therapy is a desirable approach to AIDS treatment. In the future of AIDS immune reconstruction, we can speed up the process of the prevention and treatment model of combined traditional Chinese and Western medicine. We should combine the advantages of the two and take syndrome differentiation and treatment as the guiding principle. The characteristics and stages of development, different situations, and various aspects of the patient's conditions are targeted for special treatment. Especially for patients with a longer course of the disease, the combination of traditional Chinese and Western medicine can give full play to its advantages, which is of great benefit for patients to maintain long-term and effective immune reconstruction, improve their health, and avoid the limitations and deficiencies of HART.

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