An 84-month observational study of the changes in CD4 T-lymphocyte cell count of 110 HIV/AIDS patients treated with traditional Chinese medicine

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Abstract This study aimed to evaluate the therapeutic effect of traditional Chinese medicine (TCM) by observing the changes in CD4 T-lymphocyte cell count of 110 cases with human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) treated continuously with TCM for 84 months. Information of 110 HIV/AIDS patients from 19 provinces and cities treated with TCM from 2004 to 2013 was collected. Changes in the indexes of CD4 counts (≤200, 201–350, 351–500 and >500 cells/mm³) at five time points (0, 12, 36, 60 and 84 months) and different treatments [TCM and TCM plus antiretroviral therapy (ART)] were compared. Repeated measures test indicated no interaction between group and time (P > 0.05). Degrees of increasing and decreasing CD4 count of the two groups at four different frames were statistically significant compared with the baseline. The CD4 count between the two groups was not statistically significant. For CD4 count of ≤200 cells/mm³, the mean CD4 count changes were 21 and 28 cells/mm³ per year for the TCM group and TCM plus ART group, respectively. For CD4 count of 201–350 cells/mm³, the mean CD4 count changes were 6 and 25 cells/mm³ per year for the TCM group and TCM plus ART group, respectively. For CD4 count of 351–500 cells/mm³, the mean CD4 count changes were −13 and −7 cells/mm³ per year for the TCM group and TCM plus ART group, respectively. For CD4 count of >500 cells/mm³, the mean CD4 count changes were −34 and −17 cells/mm³ per year for the TCM group and TCM plus ART group, respectively. Long-term use of TCM could maintain or slow the pace of declining CD4 counts in patients with HIV/AIDS, and may achieve lasting effectiveness.

Keywords AIDS; HIV; CD4; traditional Chinese medicine; linear models

Introduction

Acquired immunodeficiency syndrome (AIDS) is caused by infection of the human immunodeficiency virus (HIV). By the end of September 2013, the cumulative total of reported HIV/AIDS cases was 434,000 in China [1]. Highly active antiretroviral therapy (HAART) is very effective in suppressing viral replication; it has led to a significant reduction in the mortality rate of the disease, an increase in the life expectancy of HIV/AIDS patients and an improvement in the quality of life (QoL) of these HIV/AIDS patients [2–4]. However, issues such as viral reservoirs, drug resistance, high dosage and drug costs have led to a significant crisis in HIV/AIDS management, particularly in developing nations [5–7]. HAART does not provide a complete solution to these problems. Therefore, additional and alternative anti-HIV therapeutic strategies urgently need to be explored [8]. Traditional Chinese medicine (TCM) is a major practice in complementary and alternative medicine, and its use has increased [9]. Generally, people with HIV/AIDS use TCM for four main reasons: to
enhance their immune function, to treat symptoms, to improve their QoL and to reduce side effects related to medications [10,11]. The CD4 T-lymphocyte cell count in HIV/AIDS patients can be used to evaluate their immune status, and it is a laboratory parameter for assessing disease progression and determining prognosis [12]. Few clinical studies have focused on using TCM for long-term treatment of HIV/AIDS [13–15]. Most studies used t-test, non-parametric tests and other methods to analyze the CD4 count changes, which do not fully reflect the efficacy of TCM. This article will be based on HIV/AIDS patients of the pilot project named “National Free TCM HIV/AIDS Treatment Program” using repeated measures ANOVA to study the effect of CD4 count changes on the long-term use of TCM, analyze the efficacy of TCM objectively and accurately and provide a reference for clinical practice and research.

Materials and methods

Participants

HIV patients were tested positive by western blot [16]. Patients included outpatients and inpatients from 19 pilot projects.

Diagnostic criteria

Diagnostic criteria of western medicine were in accordance with the guidelines for treating AIDS [17]. Standards of syndrome differentiation were based on “Clinical Technology Solutions of National Free TCM HIV/AIDS Treatment Program” [18].

Inclusion criteria

HIV/AIDS patients were confirmed by the local center for disease control and prevention in accordance with the standards of syndrome differentiation of TCM. All the patients signed informed consent, and were treated continuously with TCM for 84 months.

Methods

Repeated measures ANOVA was used for the longitudinal observational study of changes in the same indicators for 84 months. This method has more advantages than general ANOVA, considering the overall differences between the groups, time points and each observed individual, with three areas of hypothesis testing: treatment group effect, time effect and interaction between the treatment group and time point [19,20]. The change in CD4 count was determined and stratified according to baseline CD4 cell count( $\leqslant$ 200, 201–350, 351–500 and $> 500$ cells/mm$^3$). Each stratification was further divided into two groups: TCM plus antiretroviral therapy (ART) group and TCM group.

Treatment

In accordance with the principle of “clinical technology solutions of national free TCM HIV/AIDS treatment program” [18], TCM treatment (preparation) and syndrome differentiation were selected. The treatment times of TCM and syndrome differentiation were every two to three months for a course of treatment, applying one or two courses. If the effect was unsatisfactory, other medicines were replaced. If the effect was satisfactory, treatment for one month was considered to be sufficient, and then treatment was repeated for another two months.

Fixed TCM (preparation)

(1) To strengthen the spleen and kidney and clear away heat and toxic materials, Fuzhengkangdu and Kang’aibaosheng capsules were produced from the preparation room of the Yunnan Provinical Academy of Traditional Chinese Medicine Affiliated Hospital with approval number 2005L–ZJ002 and Yunnan pharmacists word (Z) 20090004A, respectively. The dosage was four times daily and six capsules each time. (2) To reinforce the spleen and kidney, supplement qi and consolidate origin, Qilingyiqi tablet was produced by Chengdu En’wei Pharmaceutical Limited Company with country medicine number of Z20050483. The dosage was three times a day and six tablets each time. (3) To reinforce the kidney, replenish qi, activate blood and resolve stasis, Ai’keqing capsule was produced by the Institute for Tropical Diseases of Guangzhou University of Chinese Medicine. The dosage was three times daily and three capsules each time. (4) To invigorate the spleen for eliminating dampness, tonifying qi and nourishing blood, Yi’aikang capsule was produced from the preparation room of the Affiliated Hospital of Henan Province Chinese Medicine Research Institute, with batch number 20050618. The dosage was three times daily and five capsules each time.

Syndrome differentiation

Syndrome differentiation was based on the patient’s symptoms, tongue and pulse, as shown in the “Clinical Technology Solutions of National Free TCM HIV/AIDS Treatment Program” [18].

ART

HAART therapy mainly consisted of zidovudine (AZT)/stavudine (d4T) + lamivudine (LAM) + nevirapine (NVP)/efavirenz (EFV). AZT: 300 mg per time, twice daily; d4T: weight $\geqslant 60$ kg, 40 mg per time, twice daily, weight $< 60$ kg, 30 mg per time, twice daily; LAM: 300 mg per time, once