

Assessing the effect of traditional chinese medicine on CD4+ lymphocyte count of 807 HIV/AIDS cases*

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ABSTRACT

National Free Traditional Chinese Medicine (TCM) HIV/AIDS Treatment Program had been carried out for more than 5 years, treating 9267 cases accumulately by 2009. We report the 3-year outcome on CD4+ lymphocyte count of 807 cases of HIV/AIDS enrolled in the National Free TCM HIV/AIDS Treatment Program, the CD4+ lymphocyte count were measured every 6 month at 7 time points (0, 6, 12, 18, 24, 30, 36 month). The results showed that the overall CD4+ lymphocyte count maintained stable at the 6th month and the 12th month, declined significantly at the 18th month, 24th month and 30th month, then elevated to the pre-treatment level at the 36th month. Patients with pre-treatment CD4+ lymphocyte count level < 200/mm³, who possibly combined HAART therapy, had CD4+ lymphocyte count elevated significantly after all visits. Patients with pre-treatment CD4+ lymphocyte count level between 200 and 350/mm³ maintained stable before the 36th month, and then rised significantly, which implicated the long-term effect of TCM. Patients with pre-treatment CD4+ lymphocyte count level > 350/mm³ had CD4+ lymphocyte count declined significantly after all visits. In summary, combined treatment of Chinese herbal medicine and conventional therapy on HIV/AIDS suggested promising effect, but more evidences from larger, rigorous designed studies still needed to support the affirmative effect of TCM in the future.

Keywords: Traditional Chinese Medicine; HIV/AIDS; CD4+ lymphocyte count

1. INTRODUCTION

In China, an estimated 740,000 persons are infected with HIV, of whom approximately 105,000 have developed AIDS [1]. Of these, a cumulative of 319,877 patients, had been identified as of October 2009 [2]. Before 2002, when China initiated its National Free Antiretroviral Treatment Program as a pilot project among former plasma donors [3,4], antiretroviral therapy (ART) was not readily available. Treatment was rapidly scaled up, and by August 2008, more than 52,000 persons had received first-line highly active antiretroviral therapy (HAART). Traditional Chinese Medicine (TCM) intervention started from 2004, a pilot project named National Free TCM HIV/AIDS Treatment Program had been launched by The State Administrative bureau of Traditional Chinese Medicine, and quickly scaled up from 5 provinces (Henan, Hebei, Anhui, Hubei, Guangdong) to 19 provinces, autonomous regions, and municipalities in China including some places with high prevalence, 9267 cases have been treated with TCM accumulatively by 2009.

HIV weakens the immune system by attacking CD4 lymphocyte count, CD4 lymphocyte count is a strong predictor of assessing prognosis of AIDS. [5,6].

We report the 3-year outcome on CD4+ lymphocyte count of 807 cases of HIV/AIDS enrolled in the National Free TCM HIV/AIDS Treatment Program by retrospective analysis, the CD4+ lymphocyte count were measured every 6 month at 7 time points (0, 6, 12, 18, 24, 30, 36 month).

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2. METHOD

2.1. Study Design and Setting

In China, all HIV-positive patients who meet the national treatment guidelines of CD4+ lymphocyte count less than 0.200×10^9 cells/L, total lymphocyte count less than 1.2×10^9 cells/L, or World Health Organization (WHO) stage 3 or 4 disease are eligible to receive HAART[7]. When National Free TCM HIV/AIDS Treatment Program launched by 2004, HIV-positive patients who were willing to receive TCM can be enrolled in TCM program, no matter its CD4+ lymphocyte count levels. After treatment initiation, visits are scheduled at 6 months, 12 months, 18 months, and then every 6 months thereafter. Local TCM health care providers from the program complete visit-specific forms at each visit, all the information was imputed into the database. We selected 807 cases from the database which had good TCM compliance. 80% of them were paid blood donors from Henan Province with average age at 41. Male 377, female 430, 222 cases of them had combined with HAART therapy. Chinese herb medicine adopted prescriptions according to syndrome differentiation or patient used by local doctors from each province.

2.2. Statistical Analysis

T-Test statistic was used in this study for quantitative variables. SPSS, version 13.0 (SPSS, Chicago, Illinois), and SAS, version 9.13 (SAS Institute, Cary, North Car-

olina), was used for all analyses. All hypothesis testing was 2-sided, with an α level of 0.05.

3. RESULTS

3.1. CD4+ Lymphocyte Count Overall Variation

The CD4+ lymphocyte count maintained stable at the 6th month and 12th month, declined significantly at the 18th month, 24th month and 30th month, then elevated to the pre-treatment level at 36th month (**Table 1**).

3.2. CD4+ Lymphocyte Count Variations by Different Pre-Treatment Level

Patients with pre-treatment CD4+ lymphocyte count level $< 200/\text{mm}^3$, who possibly combined HAART therapy, had CD4+ lymphocyte count elevated significantly after all visits (**Table 2**). Patients with pre-treatment CD4+ lymphocyte count level between 200 and $350/\text{mm}^3$ maintained stable before 36 months, and then rose significantly (**Table 3**), which implicated the long-term effect of TCM. Patients with pre-treatment CD4+ lymphocyte count level $> 350/\text{mm}^3$, had CD4+ lymphocyte count declined significantly after all visits (**Table 4**).

3.3. CD4+ Lymphocyte Count Variations by Different Clinical Stages

CD4+ lymphocyte count of patients at both stage maintained stable at all visits which may implicated TCM effect (see **Table 5,6**).

Table 1. CD4+ lymphocyte count overall variation pre-post TCM treatment ($/\text{mm}^3$).

months	case	pre ($\bar{x} \pm s$)	post ($\bar{x} \pm s$)	t-test	P
0	807	340.42 \pm 202.14			
6	129		296.10 \pm 159.47	-0.303	<0.763
12	365		324.81 \pm 311.76	-1.688	<0.092
18	426		287.34 \pm 168.49	3.141	<0.002
24	476		280.57 \pm 170.09	4.109	<0.000
30	384		298.40 \pm 175.26	2.478	<0.014
36	807		346.02 \pm 231.11	-0.885	<0.377

Table 2. CD4+ lymphocyte count variation with pre-treatment level < 200 ($/\text{mm}^3$).

months	case	pre ($\bar{x} \pm s$)	post ($\bar{x} \pm s$)	t-test	P
0	210	120.56 \pm 55.63			
6	37		207.00 \pm 160.12	-3.597	<0.001
12	110		234.42 \pm 151.61	-8.527	<0.000
18	116		199.53 \pm 143.60	-5.832	<0.000
24	114		222.88 \pm 171.35	-6.055	<0.000
30	84		196.41 \pm 121.02	-5.521	<0.000
36	210		249.69 \pm 188.67	-9.656	<0.000

Table 3. CD4+ lymphocyte count variation with pre-treatment level between 200-350 (/mm³).

months	case	pre ($\bar{x} \pm s$)	post ($\bar{x} \pm s$)	t-test	P
0	258	276.53 ± 43.14			
6	38		282.15 ± 104.19	-0.076	<0.940
12	105		318.19 ± 470.41	-1.018	<0.311
18	130		274.20 ± 128.30	0.163	<0.871
24	151		269.90 ± 147.63	0.768	<0.444
30	119		285.06 ± 144.18	-0.175	<0.862
36	258		307.13 ± 182.81	-2.635	<0.009

Table 4. CD4+ lymphocyte count variation with pre-treatment level between > 350 (/mm³).

months	case	pre ($\bar{x} \pm s$)	post ($\bar{x} \pm s$)	t-test	P
0	339	525.24 ± 163.42			
6	34		389.67 ± 171.40	3.553	<0.001
12	118		434.23 ± 235.69	3.331	<0.001
18	139		377.65 ± 183.26	9.093	<0.000
24	152		338.47 ± 181.27	10.227	<0.000
30	127		392.29 ± 195.24	6.909	<0.000
36	339		440.10 ± 257.09	6.074	<0.000

Table 5. CD4+ lymphocyte count variation of patients at asymptomatic stage (/mm³).

months	case	pre ($\bar{x} \pm s$)	post ($\bar{x} \pm s$)	t-test	P
0	513	367.54 ± 216.48			
6	62		289.62 ± 179.22	-0.671	<0.505
12	213		359.63 ± 381.49	-0.961	<0.338
18	232		302.64 ± 174.12	3.383	<0.001
24	257		288.39 ± 176.62	4.033	<0.000
30	202		322.99 ± 188.09	2.042	<0.043
36	499		363.96 ± 250.55	0.383	<0.702

Table 6. CD4+ lymphocyte count variation of patients at AIDS stage (/mm³).

months	case	pre ($\bar{x} \pm s$)	post ($\bar{x} \pm s$)	t-test	P
0	294	285.99 ± 162.30			
6	47		286.74 ± 136.31	0.066	<0.948
12	116		279.72 ± 159.36	-2.793	<0.006
18	149		264.55 ± 161.55	0.254	<0.800
24	156		268.32 ± 161.83	1.282	<0.202
30	125		269.24 ± 155.85	1.078	<0.283
36	308		319.32 ± 198.79	-2.828	<0.005

4. DISCUSSION

It has been 23 years since Chinese government sent TCM doctors to aid Tanzania HIV/AIDS patients, therapeutic effect has been achieved through ten thousands of accumulative Tanzania HIV/AIDS cases. It

was reported that 23 cases of Tanzania patients with more than 10 years HIV/AIDS history maintained their CD4+ lymphocyte count stable around 350/mm³ by use of TCM[8]. Experimental study also showed that Chinese herb compound prescription ZY-1 may help activation and hyperplasia of CD4 cell in lymph nodes [9].

In our study, the overall CD4+ lymphocyte count maintained stable at the 6th month and 12th month, declined significantly at 18th month, 24th month and 30th month, then elevated to the pre-treatment level at 36th month, which was in accordance with the result of clinical trial conducted by Wang Jian et al. In that trial, CD4 count decreased in both groups (Aining granule + HAART; placebo + HAART) after 11 months treatment, the decrease of mean value of CD4 was significantly less in the Aining group ($-87.65 \pm 107.98/\text{mm}^3$) than in the control group ($-156.51 \pm 157.04/\text{mm}^3$, $P < 0.05$) [10].

By analysis of database, Patients with pre-treatment CD4+ lymphocyte count level $< 200/\text{mm}^3$, who possibly combined HAART therapy, had CD4+ lymphocyte count elevated significantly after all visits. Patients with pre-treatment CD4+ lymphocyte count level between 200 and $350/\text{mm}^3$ maintained stable before 36 months, and then rose significantly, which implicated the long-term effect of TCM. Patients with pre-treatment CD4+ lymphocyte count level $> 350/\text{mm}^3$ had CD4+ lymphocyte count declined significantly after all visits.

In summary, combined treatment of Chinese herbal medicine of HIV/AIDS suggested promising effect, but more evidence from larger, rigorous designed studies still needed to support the affirmative effect of TCM in the future.

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