ORIGINAL ARTICLES

The relationship between T-CD4 recovery and HIV disclosure status among HIV-infected patients on first-line antiretroviral therapy at the Hospital for Tropical Diseases in Ho Chi Minh City

Dieu Minh Nhat[1]*, Vo Van Tam[1], Tran Dang Khoa[2], Tran Thi Kim Ngan[3], Nguyen Viet Thinh[3], Cao Ngoc Nga[2]

ABSTRACT

Objective: Establishes a relationship between T-CD4 recovery and patient's HIV disclosure status.

Methods: Cross-section and clinical record review study on 151 HIV-infected patients who were 18 years old or above on first-line antiretroviral therapy (1) for 18 to 36 months at the Hospital for Tropical Diseases in Ho Chi Minh city (HCMC) in 2019. Participants are selected by convenient method. Research conducted face-to-face interviewing participants by structured questionnaire and collected data directly from each participant's respective medical record, including duration of ART, number of T-CD4 at the beginning of ART, number of current T-CD4.

Results: The results showed that within patients who revealed HIV infection to other people, the patients who revealed to their brothers and sisters recovered T-CD4 were 1.45 times more effective (95% CI: 1.09 – 1.93) compared with patients who did not disclose to siblings (p = 0.010).

Conclusion: Family members, especially siblings need to care and share so that HIV-infected patients can disclose their status. In particular, wife, husband or partners need to help and motivate patients more to make the patient's treatment better.

Keywords: *ART, T-CD4, recovery, HIV, disclosure.*

INTRODUCTION

Currently, antiretroviral therapy (1) is an effective treatment, significantly reducing the rate of death and new infection related to HIV. From 2000 to 2017, ART in the world has resulted in a 36% reduction in new infections and 38% HIV-related deaths (2). In Vietnam from 2007 to 2017, ART has resulted in a 70% reduction in the number of new infections and a 77% reduction in the number of HIV-related deaths (3).

Viral follow-up and evaluation, for T-CD4-based immunity and clinical practice, are what we must do to maintain the effectiveness of ART to achieve the goal of ending AIDS by 2030 (4-6). Monitoring of viral load, though, is a top priority in assessing response and diagnosing

**** Corresponding author:*** *Dieu Minh Nhat*
Email: dieuminhnhat@gmail.com
[1]Faculty of Public Health, University of Medicine and Pharmacy at Ho Chi Minh city.
[2]Infectious Diseases Department, Faculty of Medicine, University of Medicine and Pharmacy at Ho Chi Minh city.
[3]Pasteur Institute in Ho Chi Minh city.

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treatment failure. However, the monitoring of T-CD4 is also very necessary and recommended to replace in areas where there is no conditions to monitor viral load because T-CD4 affects effectiveness of ART. Despite achieving viral suppression, when T-CD4 is low, the likelihood of progression to AIDS or death is increased (4, 6, 7). In the world, there are studies to find factors associated with T-CD4 of patients on ART including studies on the relationship between T-CD4 and disease disclosure, such as the study of Bayou et al. in Ethiopia, the study of Kapesa et al. in Tanzania. The study of Bayou and the study of Kapesa showed patients who did not disclose their HIV status to anyone had a risk of immunological failure more than 2.3 times and 3.5 times compared to the patients who disclosed, respectively (8, 9). Meanwhile, studies on factors related to T-CD4 in ART in Vietnam currently mostly focused on clinical and laboratory factors, but rarely mention disease disclosure of patients (10, 11). Specifically, the study of Luong et al. in Ho Chi Minh City in 2015 on T-CD4 count of HIV patients showed that the median of baseline T-CD4 count was 136 (QI: 125 – 146) cells/mm^3, but this study did not conduct to find factors associated with T-CD4 (11).

Research to explore the relationship between T-CD4 recovery during ART and disease disclosure of the patients is essential. The research goals to contribute to enhancing T-CD4 related issues during ART to supply evidence, to assist medical workers and stakeholders own acceptable interventions to toil with HIV treatment in Vietnam is extra effective.

METHODS

Study design

Cross-sectional study.

Time and location

The Clinical record review study on HIV-infected patients who were 18 years old or above on first-line ART for 18 to 36 months, at outpatient HIV clinic, Hospital for Tropical Diseases in HCMC. Patients are selected by the convenient method from May to June 2019 when they were on the first-line regimen ART.

Their medical record must be show complete information about the ART initiation time, baseline CD4 count, current CD4 count and they consent to participate in the study. The study used structured questionnaires to interview consenting patients and collect data from each patient's respective medical records.

Data collection tool, technique, and procedure

Data collected include age, sex, the HIV infected disclosure status of patients to other people, people were disclosed HIV infection status by the patients, patient's duration of ART, number of T-CD4 at the beginning of ART (baseline T-CD4) and number of current T-CD4. In which, the criteria for determining that the patient's T-CD4 recovery is effective is the current T-CD4 count ≥ 350 cells/mm^3 and an increase of more than 100 cells/mm^3 compared to the number of T-CD4 at the beginning of ART (12).

Data analysis

The study used Epi data 3.1 software to enter data and Stata 14 software to analyze the data. Qualitative variables included sex, the HIV infected disclosure status of patients and people were disclosed HIV infection status by the patients. The quantitative variable with a standard distribution is the duration of ART described by mean and standard deviation.

Quantitative variables with a non-standard distribution of age, T-CD4 count at baseline were described by median and quartile interval (QI).

The study used the Chi-squared test to determine the relationship between T-CD4 recovery and the patient's HIV disclosure status with $p < 0.05$ was considered statistically significant. The study evaluated the association with the prevalence rate (PR) at 95% confidence intervals (13).

Ethical Approval

The study has received ethical consent according to the Approval of the Ethical Council in Biomedical Research at the Hospital for Tropical Diseases No. 23/ HDDD, dated 10 May, 2019. Participants are clearly explained the purposes and contents of the study and their benefits. The study is conducted only on subjects who have confirmed consent. The information of participants is kept confidential and are used only for study purposes. The study did not invasive techniques on the participants but only interviewed by structured questionnaire and collected data from medical records. Study does not affect treatment, physical and mental health of participants. Participants have right to refuse or stop participating at any times for any reason.

RESULTS

The study analyzed data from 151 patients. The patients participating in the study had a median age of 36 (QI: 30 – 40) years old, the lowest was 19 years old, the highest was 67 years old. Male patients participated more than female patients with the rates of 82.78% and 17.22%, respectively. The average duration of ART of patients was 26.86 ± 6.67 months, the lowest and highest were 18 and 36 months, respectively. The median of baseline T-CD4 count of the patients reached 145 (QI: 22 – 297) cells/mm^3, the lowest was 0 cells/mm^3, the highest was 654 cells/mm^3.

Table 1. Sex characteristic, HIV disclosure status (n = 151)

Characteristic	Frequency	Rate (%)
Gender		
Male	125	82.78
Female	26	17.22
HIV disclosure status		
Yes	126	83.44
No	25	16.56

The majority of patients revealed their HIV infection status to other people with 83.44%. Within patients disclosed their HIV infection status to other people, 56.35% of patients revealed to fathers and/or mothers, reaching the highest rate. Next, the patients who disclosed to their wife/husband and/or descendants and disclosed to their brothers

and sisters, 47.62% and 46.03% respectively. The percentage of patients disclosed to their friends and/or partners was the lowest with 21.43%.

Table 2. Disclosed of infected patients (n = 126)

Characteristic	Frequency	Rate (%)
Father and/or Mother		
Yes	71	56.35
No	55	43.65
Brothers and sisters		
Yes	58	46.03
No	68	53.97
Wife/husband and/or descendants		
Yes	60	47.62
No	66	52.38
Friends and/or Sexual partners		
Yes	27	21.43
No	99	78.57

The study found that T-CD4 recovery was not statistically significant difference between patients who revealed their HIV infection status and those who did not reveal HIV infection status to other people (p = 0.471). However, within patients revealed their HIV infection status to other people, a statistically significant association was found between T-CD4 recovery and HIV disclosure status with their brothers and sisters. Specifically, patients who revealed to their brothers and sisters recovered T-CD4 were 1.45 times more effective (95% CI: 1.09 - 1.93) than patients who did not disclose to brothers and sisters (p = 0.010). On the other hand, the study found no association between disclosed HIV status to fathers and/or mothers (p = 0.425), wife/husband and/or descendants (p = 0.058), friends and/or partners (p = 0.899) with T-CD4 recovery.

Table 3. Relationship between T-CD4 recovery and HIV disclosures status

Characteristic	T-CD4 recovery		p	PR (95% CI)
	Effective n (%)	Ineffective n (%)		
HIV disclosure status (n = 151)				
Yes	76 (60.32)	50 (39.68)	0.471	0.89 (0.65 – 1.20)
No	17 (68.00)	8 (32.00)		
Father and/or Mother (n = 126)				
Yes	45 (63.38)	26 (36.62)	0.425	1.12 (0.84 – 1.51)
No	31 (56.36)	24 (43.64)		
Brothers and sisters (n = 126)				
Yes	42 (72.41)	16 (27.59)	**0.010**	**1.45 (1.09 – 1.93)**
No	34 (50.00)	34 (50.00)		
Wife/husband and/or descendants (n = 126)				
Yes	31 (51.67)	29 (48.33)	0.058	0.76 (0.56 – 1.02)
No	45 (68.18)	21 (31.82)		
Friends and/or Sexual partners (n = 126)				
Yes	16 (59.26)	11 (40.74)	0.899	0.98 (0.69 – 1.39)
No	60 (60.61)	39 (39.39)		

DISCUSSION

The median age of patients in the study is 36 (QI: 30 – 40) years old, the lowest is 19 years old, the highest is 67 years old. This age is quite similar to the study of Adewumi et al. in Nigeria in 2015 was 35 years old (14), the study of Kroeze et al. in the sub-Saharan region in 2018 was 37 (QI: 31 – 43) years old (15). The average duration of ART was 26.86 ± 6.67 months, the lowest and highest were 18 and 36 months, respectively. The duration of ART in this study was shorter than the study of Bayou et al. in Ethiopia in 2015 (9).

The patient's median of baseline T-CD4 count was 145 (QI: 22 – 297) cells/mm^3, the lowest was 0 cells/mm^3, the highest was 654 cells/mm^3. This result is similar to the study of Kroeze et al., Bayou et al. (9, 15). The majority of patients in the study revealed HIV infection to other people with 83.44%. This is similar to the study of Bayou et al. (9). Within patients disclosed HIV infection to other people, the percentage of patients disclosed to their friends and/or partners is low, only 21.43%. This may be due to a patient's fear of stigma, so they are less likely to disclose their HIV status to friends and/or partners compared with family members, whom patients trust more. It is worthy noting as the risk of sexually transmitted HIV transmission, although decreased when ART reaches a viral suppression level, is not completely absent, not to mention ineffective ARV patients. So

the fact that infected people do not tell their partners about their condition can spread the disease to the community.

Among patients who revealed HIV infection to other people in the study, the patients who revealed to their brothers and sisters recovered T-CD4 achieved 1.45 times more effectively (95% CI: 1.09 – 1.93) times compared with patients who did not disclose with siblings (p = 0.010), the difference was statistically significant. Some studies, such as the study of Bayou et al., Kapesa et al. showed that patients who revealed HIV infection to other people were less likely to fail to immunity than those who did not (8, 9). This result could be explained by the fact that when disclosing HIV infection to a person that patients trust, the patient will reduce stress, anxiety and have more people to share and support in the ART process. However, if only considering whether or not to reveal HIV infection to other people and T-CD4 recovery in our study, there is no correlation. This could be due to T-CD4 recovery is significantly different in groups of patients who disclosed their HIV status, however the T-CD4 recovery is not enough to have statistical significance between the two groups with and without disclosure. Therefore, similar studies need to be conducted to find out more fully.

Additional, the sexual transmission rate of HIV continues to increase from 63.2% to 67.2% in Vietnam, especially among men who have sex with men. Implementation of harm reduction interventions for the wife/husband or partners of HIV-infected patients who inject drugs is still difficult (16). So the low rate of HIV-infected patients who disclosed their status to other people in our study is of concern because this can increase the risk of HIV transmission. Therefore, physicians and health workers should regularly provide knowledge of HIV transmission for patients in counseling, treatment so patients can practice safe sexual behaviors.

This study has some limitations. The study applied the convenient sampling method, taking place at a certain place is outpatient HIV clinic, Hospital for Tropical Diseases in HCMC so it cannot extrapolate. The study reviewed medical record so data is missing at sometimes. The better study could be used in this situation is longitudinal study. The study was only on the HIV disclosure status of the patients, however other social factors could be related to T-CD4 that the study did not conduct yet.

CONCLUSION AND RECOMMENDATIONS

Within patients who disclosed their HIV infection status to other people, the patients who disclosed to their siblings recovered T-CD4 were 1.45 times more effective (95% CI: 1.09 – 1.93) compared to patients who did not disclose to their siblings (p = 0.010). Therefore, family members, especially siblings need to care and share so that HIV-infected patients can disclose their status. In particular, wife, husband or partners need to help and motivate patients more to make the patient's treatment better.

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