THE ROLE OF CARE, SUPPORT AND TREATMENT TO BIOLOGICAL PARAMETERS AND CLINICAL CHANGES OF PLWHA IN IDICU

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ABSTRACT

There have been many recent excellent reviews of the role of care, support and treatment (CST) factors in the onset and course of disease like HIV&AIDS infection. As knowledge of the underlying immunological mechanisms in HIV & AIDS is developed, more attention was directed at possible links between the immune system and psychosocial and biological influences, as well as the immune and central nervous system. This study was aimed to disclose the CST influences to biological parameters (CD4, total T lymphocytes) and clinical changes of HIV&AIDS patients. This study used observational design with panel study approach in IDICU. Fourteen HIV&AIDS infection patients taken by simple random sampling were enrolled in this research. Fourteen persons with a high risk of HIV infection non-reactive served as control. Three times examinations were done in this research. The first, when the patients had not known the HIV infection status in the first day of signing the informed consent, the second (day-7) they were are in acute stress condition after HIV infection diagnosis is informed, and the third (day-31), they were in chronic stress condition and acceptance of this disease. The result of this research was subjected to multivariate analysis. The result of the first examination reveal that CD4 declined both of the HIV infection and non HIV infection group, less than 1000 cells/mm^3. The decline progressed faster in the HIV group. Second examination showed CD4 declined not only by stimulation of biological stress HIV to lymphocytes but also to other immune cells. The decline also progressed faster in HIV group The result of the third examination revealed that CD4 decline progressed faster in the HIV than non-HIV group. It was found that lymphocyte count of both the HIV infection and non-HIV infection groups had no significant difference. Care, support and treatment can reduce stigma and other negative consequences of being HIV-positive and in this way make people less reluctant to seek HIV counseling and testing. In conclusion, CD4, total T lymphocytes and clinical performance are very unique on HIV/AIDS patients. CD4 decline is not always followed by the decline performance status. Associations of PLWH, peer group, family members, doctors, nurse, community support are a good example of community mechanisms that provide both of psychological and psychosocial support.

Keywords: *CST influence, biological and clinical parameters, PLWHA*

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INTRODUCTION

Care, support and treatment have a very important meaning in improving quality and prolonging life expectancy of people living with HIV & AIDS (PLWHA). HIV & AIDS as infectious diseases until recently is still becoming a global health problem. The ever growing problem related to HIV & AIDS infection is its high mortality and morbidity (Zavasky 2001). Data found in practice revealed with the involvement of PLWHA, family and AIDS care society, physician, nurse, life expectancy of PLWA is getting better. Condition is supported by early acceptance process. Quality and life expectancy of PLWHA are influenced by several factors. Internal factor influencing HIV density is in the patient's body, immune response, and acceptance of the illness. External support, i.e. care and treatment support from physician, paramedic, partner, fellow PLWHAs, public figure will have positive influence on quality or life expectancy for HIV and AIDS patient (Cupler 1997; Kaplan 2003).

In due course the approach for management of this disease is not adequate if it is merely based on antiretroviral therapy. A holistic approach is needed, including psychological and psychosocial support. This is important because CST will influence behavior and physical performance, including cellular behavior, and individual body defensive mechanism. Based on those facts, it is necessary to carry out a study in order to

reveal influence of CST to biological and clinical parametric changes for patients with HIV and AIDS in infectious diseases intermediate care unit (IDICU).

MATERIALS AND METHODS

This was an observational study with observation and measurement of various variables of study subject according to natural condition. As subjects of this study are patients infected with HIV&AIDS. This study had a purpose of revealing the difference of CST influence on biological parametric changes (CD4, Total lymphocyte) and clinical parameter (performance status) in high-risk group with HIV infection with those in high-risk groups without HIV infection as comparison. On each subject from both groups follow up were conducted every 30 days. Study design was panel study. Compared groups were high-risk group with HIV infection and similar group without HIV infection. From both groups CD4 were examined and observed, also T lymphocyte, performance status using *Karnofsky Score*.

Because of HIV transmission factor influenced disease progress, which would influence study result (CD4), it was necessary to stratify the risk factors in order to achieve more homogeneous strata (subgroup). Randomization was conducted separately in each subgroup. Then selected subjects would be regrouped in the appropriate group. So in this study, randomization was conducted inside the sub group (*stratified randomization*), by using simple random sampling. Sample choosing from HIV infected patients were done using strata based sampling, while for homogenous sample from high-risk groups with HIV infection with similar group without HIV infection as comparison. Individual matching was based on age, gender, nutrition status, risk factors, and time of contact with high-risk person.

Peripheral blood sampling were conducted three times: baseline (initial test), taken on the first day of inclusion, but the patient was still not knowing whether he was infected with HIV or not. Patients expressed their agreement for study procedure and signing informed consent after thorough explanation as subjects and agreement for blood sampling. The second test was conducted on day 7. The third test, conducted on the 31st day. Every subject received counseling for pre and post HIV serologic test. Performance status was also measured 3 times alongside the blood sampling.

RESULTS

After randomization and 14 samples were taken along with 14 comparisons, after tested with difference test for data sampling, there were homogenous results from all four mechanisms of transmission; vertical, transsexual, intravenous drug user and mixed group. On further counting and analysis were classified to HIV infected group and high-risk group without HIV infection.

Test of difference was conducted on CD4 and lymphocyte between HIV+ and HIV– on the first day. Calculation of laboratory result from the study and analysis is shown in Table 1. Test of difference of CD4 and lymphocyte between HIV+ and HIV- was carried out on the seventh day. The result is shown in Table 2. Test of difference of immunological variable between HIV+ and HIV- on the thirty-first day is shown in Table 3. Changes of CD4 in HIV positive and HIV negative group on day 1, 7, and 31 are shown in Table 4 and Figure 1. For HIV infected since the first test and the seventh day test there were decrease of CD4, but the decrease on the seventh day was slightly below baseline. Then the level increased slightly until finally decreased on the 31st day examination (Figure 1). HIV positive group had an increase in the seventh day test and sharp decrease on the thirty-first day. In the HIV negative there was a slight decrease on the seventh day and on the thirty-first day test there was a sharp increase (Figure 2).

Table 1: Mean of immunology variable on the first day

	Infected group			
	HIV +		HIV -	
	Mean	SD	Mean	SD
Lymphocyte	1.6271	0.4349	1.7171	0.4540
CD4	250.29	230.15	598.50	370.70

Table 2. Mean of immunological variable on the seventh day

	Infected group			
	HIV +		HIV -	
	Mean	SD	Mean	SD
Lymphocyte	1.7271	0.3202	1.7507	0.2237
CD4	227.71	200.58	677.86	488.61

Table 3. Mean of immunological variable on the thirty-first day

	Infected group			
	HIV +		HIV -	
	Mean	SD	Mean	SD
Lymphocyte	1.6029	0.3891	1.7586	0.2819
CD4	305.14	265.00	598.79	373.57

Table 4. Mean of CD4 variable on the 1st, 7th and 31st day

	Day 1	Day 7	Day 31
HIV Pos	-0.4962	-0.5207	-0.418
HIV Neg	0.4962	0.5207	0.418

Table 5. Means of lymphocyte variable on the 1st, 7th, and 31st day examination

	1 day	7 day	31 Day
HIV Pos	-0.1025	-0.0433	-0.2271
HIV Neg	0.1027	0.04355	0.2272

DISCUSSION

HIV transmission into the human body came through three routes: (1) vertically from mother to child, (2) transsexual (homosexual or heterosexual), (3) horizontally, through blood contact (joint usage of injection needle, tattoo, body piercing, blood transfusion, haemodialysis, dental care, mass

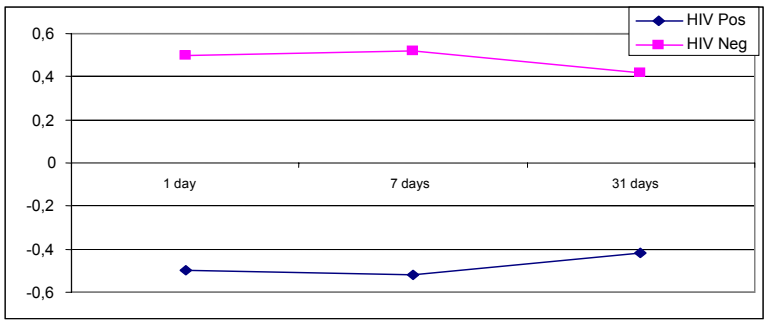

Figure 1. Graph showing observation of CD4 on the 1st, 7th, and 31st day

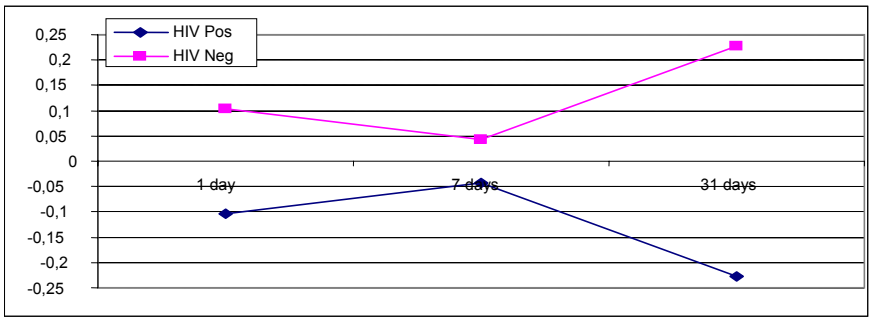

Figure 2. Graph showing lymphocyte count on the 1st, 7th and 31st day

circumcision, etc). In order of self-defense through effective coping behavior, although stress is increased, the psychopathology can be prevented. This success aside, due to natural coping accelerated by influence of continuous counseling and fellowship. Every human has natural coping which is a response from various process.

This can influence the learning process in various parts of the brain. Therefore astrocyte, microglia, neuron will decrease production and secretion of cytokine. In relation with death and terminal illness acceptance process stated by Dr. Kubler-Ross (denial and isolation, anger, depression, bargaining, and acceptance), the natural defensive mechanism will influence coping

mechanism, and decreasing activity of hypothalamic-pituitary-adrenal axis (HPA) (Lesserman 1999). Decrease of HPA axis influences the decrement of neuromodulator and neurotransmitter production and secretion (Schleifer 1992; Mayer 2003), and, finally, the decrease of cortisol production and secretion by the spongiosum of the fasciculate zone in the adrenal cortex (Atanackovic 2003, Becher 2004). As long as this chronic stress is going, patients with their close relative were given continuous counseling to lessen the psychological and psychosocial impacts. Decrease of psychological and psychosocial stress will influence the activity of limbic system, and HPA axis (Burt 1993; Chrousos 1995).

In this study there were three subjects showing marked anomalies in their laboratory result, especially in the degree of CD4 decrease. Subjects no 3, 8, and 23 showing sharp decrease of CD4 (<100 sel/mm^3), according to WHO they were included in severe decrease. The infinitely small CD4 count on these subjects should have been infected by secondary infection. But the fact was, all of them had no secondary infection. All three of them came from HIV infected group. The low CD4 count on the first examination showed the strength of HIV biological stress on the changes in CD4.The CD4 count was tended to decrease from the first, seventh and thirty-first test.

This tendency was influenced by HIV biological stress which, as the time goes, will be stronger due to increasing amount of HIV (caused by replication) and the depressed T lymphocyte was becoming more common. This CD4 decrease from the first to the last test, HIV biological factor aside, is also influenced by psychological stress after revealing of HIV diagnosis, and psychosocial stressor due to discriminative behaviour of the society.

An interesting point from those three subjects was that they came from HIV infected group with very severe decrease in CD4 (< 100 cells/mm^3) but the physical behaviour and clinically still good enough (*Karnofsky Score* = 100). If merely based on CD4, count the three subjects should have shown score under 40. This prime physical performance of the three subjects is an implementation of early acceptance of HIV. This was made possible in relation with pre and post counseling of HIV serology, fellowship program for PLWA and their family and treatment program by physician and care program by the paramedic as had been done by the Infectious Disease Intensive Care Unit (IDICU) in Dr. Soetomo Hospital.

Data from the three subjects of HIV infected group: Subject no 3 was an active homosexual since 4 years ago, graduated of junior high school, with a steady job. Subject no 8 was a heterosexual with various partners since 3 years ago, university graduate, with steady job. Subject no 3 was an intravenous drug user since more than 6 years ago, heterosexually active since 14 years ago, high school graduate, with a steady job. Based on these three characteristics, HIV infected through T lymphocyte using different transmission route. Even though the three had the same decrease in CD4, but the transmission was different. To evaluate the influence of transmission on CD4 decrease, we required further study.

Three other subjects interesting for study were subject no 5, 16 and 17. All of them showing decrease of CD4 until severe level (>100-< 200 sel/mm^3). Subject no 5 was an homosexual since more than 5 year ago, high school graduate, beauty salon, came from the comparison group. Subject no 16 was from HIV infected group, active drug user since 5 month ago, junior high school graduate, with unsteady job. Subject no 17 was from the HIV infected group, active drug user since 2 months ago and heterosexual, high school graduate, working as security in a discotheque. Low count of CD4 in all these patients was not followed by the decrease of their performance. However, they had effective defensive mechanism due to full support given by their group *Persatuan Waria Kota Surabaya* (PERWAKOS), *ASA* (Aksi Stop AIDS) Surabaya, Ners Foundation, physician and paramedic since joining in the IDICU in Dr. Soetomo Hospital.

Subject no 16 and 17 suffered from severe psychological problem. After diagnosis of HIV/AIDS was revealed, the patients were rejected by the family and their immediate environment. The weakness of this study was that it was not done psychometrically, but the defensive mechanism was quite effective as shown by good *Karnofsky score.* Both subjects also underwent acceleration of early acceptance process to their illness through program case manager, fellowship, and treatment developed in the IDICU.

This study showed the unique nature of way of life in population with high risk HIV infection. Psychological, psychosocial, and biological aspects are difficult to separate. Biological parameter showed such severity, but there was no secondary infection found (*Karnofsky score* = 100). Subjects with severe psychological burden due to inacceptance by their family and society had good physical performance. This was different from the study by Lang (2002), showing that most of the subjects suffered from anxiety and depression.

The unique nature of high risk subjects, achievement of early acceptance process of HIV/AIDS, activity of

controlled HPA axis in homeostasis position, effectiveness of learning process in cellular level, behavior from wise health staff especially during the initial revealing of HIV/AIDS diagnosis, by maintaining patient friendly stages, treatment, care and fellowship were created in the IDICU through holistic management by pre and post HIV serological test counseling, counseling in the UPIPI, family counseling, advanced counseling, ARV treatment counseling, treatment by physician, care by paramedic, fellowship by PLWA, NGO, family and AIDS care society, and attention from various governmental and non governmental institution, macronutrient based nutrition, physical fitness, and regular breathing exercise (Depkes RI 2003). This condition is wholly different from the previous ones, before the implementation of psychosocial support management. Initially the management took the approach of merely therapeutic program and care. Holistic management in IDICU decreased fatality rate from almost 100% to 27.9% on March 2005.

CONCLUSION

Individual defensive mechanism of HIV&AIDS patients is very unique. They have poor biological parameter (CD4<100 sel/mm^3), where secondary infection and poor performance status should have been observed. On the contrary, in those patients normal physical activity and good performance status are observed (*Karnofsky score* = 100). Therefore, individual defense mechanism of HIV&AIDS patient is not merely influenced by HIV intervention, but also by care support and treatment.

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