

The Effect of Lifestyle on Physical Conditions as Observed by CD4, SGOT, and SGPT of People Living with HIV: A Case Study at Dr. Iskak Hospital in Tulungagung Indonesia

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Abstract

HIV-AIDS, or Human Immunodeficiency Virus, which is the cause of AIDS ailment, or Acquired Immunodeficiency Syndrome, works by attacking white blood cells, which then leads to compromised immune system, making the person affected more susceptible to different other ailments. The virus can be found in semen, vaginal fluid, cervix, as well as blood, resulting in impairment of CD4+ as an effect of the HIV virus on human immune system. This study aims to identify and analyze the relationship between the pattern of the physical condition of people living with HIV with CD4+ indicator, SGOT and SGPT as well as a reference to improve knowledge about HIV in the laboratory. This research is experimental analytic done with the aid of Pearson statistical correlation test. The samples were thirty (30) HIV-AIDS patients at the Dr. Iskak Hospital in Tulungagung, Indonesia, who were being interviewed through a set of questionnaires given out between February to June 2013. For CD4+, the study result done using Pearson statistical correlation showed that P value is greater than α , namely $P = 0,854$, and, as such, it is concluded that there is a relationship between the lifestyle and the physical condition of patients living with HIV. However, for SGOT and SGPT, the P values are smaller than α , namely $P = - 0,323$ for SGOT and $P = - 0,073$ for SGPT.

Keywords: HIV, AIDS, lifestyle, physical condition, examination of CD4+ test, SGOT and SGPT

Introduction

This virus can be both found in and transmitted through semen, vaginal fluid, cervical fluid, and blood. Most patients who are diagnosed with HIV show psycho-social changes within themselves, e.g. suffering from depression, lack of social acceptance, and change in behaviour¹.

HIV virus attacks the organs responsible from immune system, such as T helper cell or CD4+, macrophage, and dendritic cells, which then causes the amount of CD4+ to decrease to be less than 200c/mm³. An acute infection of HIV will turn into a clinical latent infection, and early symptoms of HIV infection will eventually show and become AIDS as can be identified by the CD4+ test and Opportunistic Infection².

Health-related officials and society should ideally have a great understanding about care, support, and

treatment for people living with HIV-AIDS. To date, there is no cure for this virus. However, medicine to slow down the degenerative effect of the virus is at hand. Unfortunately, many people, especially those in rural areas, still have a misconception about this condition and, as such, avoid the people who live with HIV-AIDS³.

The number of HIV cases increase every year in Indonesia. As of June 2011, the reported case of HIV was 26,483 across 33 provinces and 300 cities/regencies. The most significant increase was seen in East Java Province with the additional 239 patients in the year of 2011 alone⁴.

According to the official data from Commission for AIDS Prevention and Treatment, there were 424 people living with AIDS as of October 2011 in Tulungagung alone, with 131 of amongst which passed away due to the ailment. As in the end of 2012, 153 people out of 617

reported cases passed away. To date, the reported case of HIV findings in Tulungagung is relatively high across East Java Province⁵.

The HIV patients who have learned to accept and cope with their condition tend to have better perceptible physical conditions than their other counterparts. To aid with their immune system and to slow down the progression of the virus, an Anti-Retro Viral, or ARV, is usually administered. Although ARV can increase the amount of CD4+, long-term ARV medication can affect liver enzymes and, thus, increase the SGOT (Serum Glutamic Oxal-acetic Transaminase) and SGPT (Serum Glutamic Piruvic Transaminase). However, it was found that there were some patients with decreasing values of SGOT and SGPT. This finding certainly needs further investigation⁶.

Methods

The populace was taken from the patients of HIV-AIDS who were being treated at Dr. Iskak Hospital in Tulungagung, East Java, Indonesia, whereas the sample was those in this populace who were willing to be respondents in the study. There were thirty (30) respondents in total. Each of these thirty respondents was given a set of questionnaires, which, amongst others, probed about their lifestyle and their physical conditions. The laboratory results of their CD4+, SGOT, and SGPT, paired with their questionnaire answers were then analysed

Examination of CD4+

Method : Flow cytometry

Goal : To determine the amount of blood cells (CD3+ dan CD4+)

Principle : Monoclonal Antibody (MoAb), which is coloured with a fluorescent chemical compound called fluorochrome, will create a bond with specific antigen, or Ag, on the surface of leucocyte. The Ag-MoAb complex can then be identified by its fluorescent glow when it is being passed under the laser light emitted by the flow cytometry.

Material : Blood taken from venae veins with anticoagulant Ethylene Diaminete Tetra

Acetate (EDTA)

Tools : - Pima Analyser

- Micropipette

- Yellow tip

- Cartridge

Workflow:

1. Turn on the Pima Analyser and press OK on the keyboard when the screen shows “Run Test, Press OK”

2. Before running the sample, do Pima bead standard (low bead and normal bead) running every morning or every time the tool is being moved by putting in the cartridge low or normal.

3. Wait for ten minutes for each bead standard and record the result (low bead or normal).

4. Take 25 uL sample with a pipette and put the sample into cartridge (sample collector). Avoid any bubble from forming.

5. Close the cartridge tightly.

6. Put in the cartridge (Pima bead sample) until you hear a click and Pima analyser automatically pull in the cartridge into the machine.

7. Enter the name of the operator and the name of the sample.

8. Wait for around twenty minutes for the process to take place, after which take out the cartridge and print the result by pressing the OK button

Examination of SGOT and SGPT

Method : IFCC (Enzymatic)

Goal : To determine the level of SGOT and SGPT

Principle : Kinetic determination

L-Aspartate + α - Ketoglutarate Oxaloacetate + L - Glutamate

Oxaloacetate + NADH + H⁺ L-Malate + NAD⁺

MDH = Malate dehydrogenase

Material : Serum

Tools : - Selextra X and Cobas

- Centrifuge

- Cup sample

- Tube

Workflow:

1. Do control and calibration of the tool before running the sample

2. Reagent is being put in its respective place according to the user's wish

3. Write down the following data on the tool's label (laboratory number, medical record number, patient's details, and doctor's name)

4. Assign number to each sample and put them in their respective places

5. Start the tool and wait for the result (8-10 minutes)

Results and Discussions

From the study conducted between February to June 2018, data of CD4+, SGOT, and SGPT from thirty samples taken from HIV patients can be seen on table 1.

Table 1. Levels of CD4+, SGOT dan SGPT of thirty samples of HIV patients at Dr. Iskak Hospital in Tulungagung

No	Name	Age (year)	CD4 Normal Value (cell/mm3) 500 – 1500	SGOT/SGPT Normal Value u/L (0-40/0-41)	
1.	WST	42	194	27	25
2.	SYN	38	10	38	41
3.	GNW	49	179	25	29
4.	NYT	37	123	30	29
5.	KAL	42	29	42	38
6.	MRY	23	304	34	35
7.	ITK	24	192	29	32
8.	KDR	60	53	55	61
9.	EK	41	251	22	21
10.	AG	35	285	30	32
11.	KMJ	50	160	40	44
12.	SSD	42	296	28	30
13.	YLN	32	313	18	21
14.	HM	43	258	24	21
15.	KT	25	121	37	36
16.	SBR	50	138	40	39
17.	MJ	48	144	36	40
18.	SL	31	100	38	35
19.	WG	29	15	67	59
20.	WNS	32	221	27	31
21.	RN	32	127	27	26
22.	YN	41	66	46	45
23.	YLI	45	70	27	29
24.	TMJ	27	171	36	33
25.	ZZ	38	313	23	26
26.	PWT	43	184	29	32
27.	AF	26	114	121	166
28.	SAY	39	22	54	20
29.	BRY	34	40	40	35
30.	AN	39	247	17	8

Source : Primary Data for Examination of CD4, SGOT and SGPT

Note:

Most patients have age between thirty (30) to forty-five (45) year old, have CD4+ values which range between 70 – 300 cell/mm³ with normal value 500- 1500 cell/mm³, have values of SGOT dan SGPT range between 10 – 45 u/L, which is under normal category, i.e. 0 – 41 u/L.

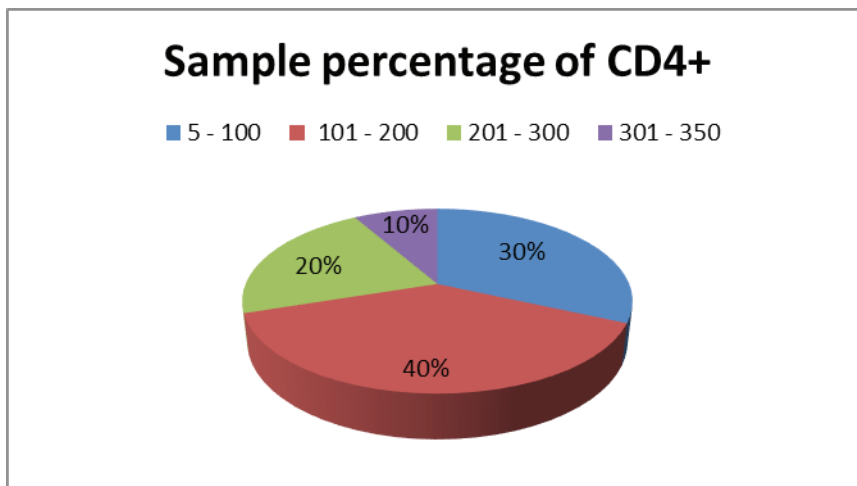


Figure 1. Sample percentage of CD4+

- a. 5 – 100 cell/mm³ : 9 patients = 30% , very low
- b. 101 - 200 cell/mm³ : 12 patients = 40%, quite low
- c. 201 - 300 cell/mm³ : 6 patients = 20% , low
- d. 301- 350 cell/mm³ : 3 patients = 10% , medium

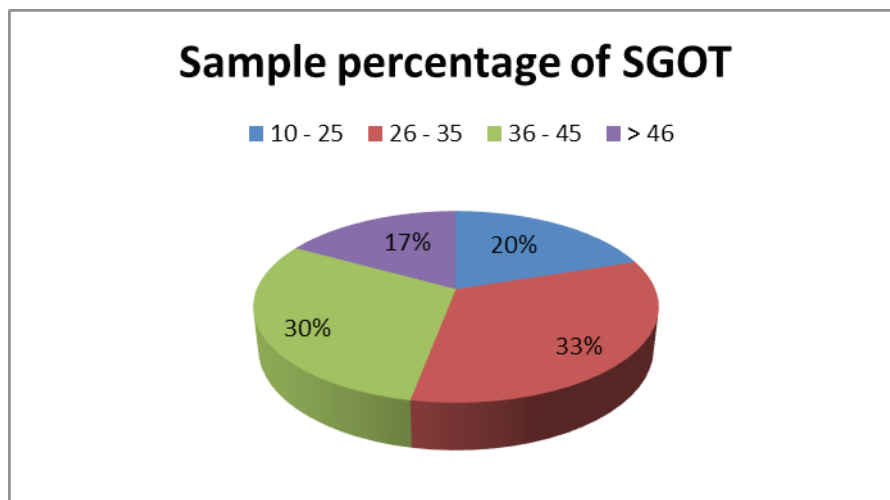


Figure 2. Sample percentage of SGOT

- a. 10 - 25 u/L : 6 patients = 20%
- b. 26 - 35 u/L : 10 patients = 33%
- c. 36 - 45 u/L : 9 patients = 30%
- d. > 46 u/L : 5 patients = 17%

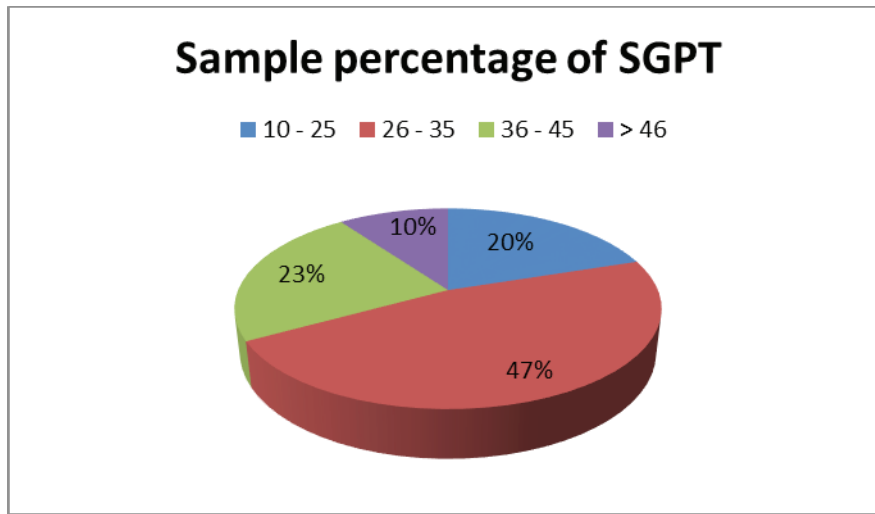


Figure 3. Sample percentage of SGPT

- a. 10 – 25 u/L : 6 patients = 20%
- b. 26 – 35 u/L : 14 patients = 47%
- c. 36 – 45 u/L : 7 patients = 23%
- d. > 46 u/L : 3 patients = 10%

Normality Test

First and foremost, *Kolmogorov-Smirnov* test was conducted to determine the distribution of the data. If the data has normal distribution, then a parametric test shall be conducted. Otherwise, a nonparametric one shall be conducted.

From *Kolmogorov-Smirnov* test, it was found that for CD4+, the p is 0.964; for SGOT, the p is 0.070 (which is more than α); for lifestyle, the p is 0.152 (which is more than α with $\alpha = 0.05$), whereas for SGPT, the p is 0.015 (which is less than α).

Conclusion: the data have normal distribution.

Pearson Correlation Test

To determine the relationship between lifestyle, physical condition of the patient, and their levels of CD4+, SGOT, and SGPT, Pearson correlation test was conducted with the following hypotheses:

Ho : There exists no relationship between lifestyle and physical condition of the patient according to their levels of CD4+, SGOT, and SGPT

Hi : There exists relationship between lifestyle and physical conditions of the patient according to their levels of CD4+

From the Pearson correlation test, it was found that $p > \alpha$ for CD4+ $p = 0.000$, with the correlation coefficient (r) being positive, i.e. 0.854, which indicates that there exists relationship between lifestyle and physical condition of the patient with the examined CD4+ as much as 85.4%; whereas the rest of 14.6% was due to other factor(s). For SGOT case, it was found that $p > \alpha$, i.e. 0.082, with the correlation coefficient (r) being negative, i.e. -0.323. For SGPT case, it was found that $p > \alpha$, i.e. 0.701, with the correlation coefficient (r) being negative, i.e. -0.073. These indicate that there exists no relationship between lifestyle and physical condition of the patient with the examined SGOT and SGPT values.

From the Pearson correlation test on CD4+ examination, it was found that (p) $< \alpha$ (0.000), which indicates that there exists a relationship between lifestyle and physical condition of the patient with the examined values of their CD4+. The positive correlation coefficient of 0.854 indicates that this relationship is a strong and positive relationship, which means that when the lifestyle and physical condition of the patient improves, their levels of CD4+ also improves.

However, for SGOT examination, it was found that (p) $> \alpha$ (0.082), which indicates that there exists no relationship between lifestyle and physical condition

of the patient with the examined values of their SGOT. The negative correlation coefficient of -0.323 indicates that this relationship is a negative one, which means that when the lifestyle and physical condition of the patient improves, their levels of SGOT do not necessarily increase.

The similar result was reflected from SGPT examination where it was found that $(p) > \alpha$ (0.701), which indicates that there exists no relationship between lifestyle and physical condition of the patient with the examined values of their SGPT. The negative correlation coefficient of -0.073 indicates that this relationship is a negative one, which means that when the lifestyle and physical condition of the patient improves, their levels of SGPT do not necessarily increase.

From the previous study in 2012 from North Sumatra University, entitled "Overview on the Lifestyle of Patients of HIV-AIDS Treated at RSUPH Adam Malik in Medan", it was found that the majority, i.e. 70.58% of the seventeen (17) respondents, led a poor lifestyle, as observed from their physical limitations, vitality, social functions, and mental health⁷.

However, this study did not indicate similar results as were shown in Tan Mei Kun's which may be due to the difference between the level of awareness of the patients of their own health condition. Lacking awareness of their condition, the patients at RSUPH in North Sumatra may not have taken care of their lifestyle as well as the patients at Dr. Iskak Hospital in Tulungagung did after their HIV diagnosis.

SGOT, or *Serum Glutamic Oxal-acetic Transaminase*, also known as *Aspartate Amino Transferase* (ASAT), can be found in cytoplasm and mitochondria of the cells of liver, heart, muscle, kidney, pancreas, and erythrocyte⁸.

SGPT, or *Serum Glutamic Pyruvic Transaminase*, also known as *Alanine Amino Transferase* (ALT) can be mainly found in cytoplasm of the cells of liver and some in kidney, heart, and muscle⁹.

It was found in this study that the SGOT and SGPT levels have yet to increase, which indicates that the liver cells have yet to deteriorate. When the cells of that organ have deteriorated, the levels of SGOT and SGPT in the

serum would accordingly increase^{10,11}.

Conclusion

There exists a relationship between lifestyle and physical condition of the patient with the examined CD4+. However, there exists no relationship between lifestyle and physical condition of the patient with the examined SGOT and SGPT.

Conflict of Interest Statement: The authors of this research declare that there is no conflict of interest related to this study

Source of Funding: All funds used to support this research come from the Ministry of Health, Health Polytechnic Jakarta II – Indonesia, Grant of Risbinakes Program

Ethical Clearance: The ethical clearance of this research taken from Ethics Committee of Health Polytechnic Jakarta II – Indonesia (Ethical Approval LB.04.05/KE/30/503a/2018)

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