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CORRELATION OF SPIRITUAL SCORE WITH CD4 LEVELS IN HIV PATIENTS SUFFERING DEPRESSION IN HAJI ADAM MALIK GENERAL HOSPITAL MEDAN

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Abstract

Background
Chronic illnesses greatly affect the mental (psychological) concept of the patient, so holistic management is needed. Serious diseases such as cancer, heart disease, stroke, and Human Immunodeficiency Virus (HIV) infections often occur with depression. Percentage of depression in people with infection with Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome (HIV / AIDS) of 22% -45%, even as many as 15% -20% conducting suicide attempts.

Method
This study was conducted on all HIV patients who came for treatment at the Center for Special Services Clinic (Pusyansus) Medan Haji Adam Malik General Hospital, observational with a cross-sectional design, starting in July 2019 until September 2019. The patient supports filling the FACIT Sp 12 questionnaire which contains 12 questions filled in ± 5 minutes.

Result
The study involved 52 subjects with a mean age of 33 ± 8.5 years, male subjects as many as 35 (67.3%) and 17 women (32.7%). There were 25 people with severe depression (48.1%), 14 people (26.9%) mild depression and 13 people (35%) moderate depression. The average spiritual FACIT score was 24.15 ± 7.58. The mean CD4 value was 98.11 ± 94.54.

Discussion
In the study, a significant negative power correlation was found between depression and spiritual scores. Spiritual scores have a strong positive correlation with CD4 + levels in HIV / AIDS patients. Psychotherapy also enhances neuronal development and neural network integration. Changes that occur in the brain are in line with changes in glucose metabolism, neurotransmitter concentration, and blood flow, which in turn increases the immune system (CD4).

Conclusion
In this study, spiritual scores were found to be significantly correlated with CD4 + levels in HIV patients suffering from depression. The higher spiritual scores showed higher CD4 levels.

Introduction

Background
Serious diseases such as cancer, heart disease, stroke and Human Immunodeficiency Virus (HIV) infections are often accompanied by depression. Depression can change the course of HIV infection by impairing immune function, affecting behavior and contributing to non-compliance with therapy. (Moosa, 2005)

The percentage of depression in people with infection of Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome (HIV / AIDS) is 22% -45%, even as many as 15% -20% attempted suicide. Study has reported a higher prevalence rate in HIV+ women compared to HIV+ men and an increased risk of depression among HIV+ people with substance abuse disorders and among those who have same-sex sexual partners. (Boadu, et al., 2016)

Causes of depression in people living with HIV/AIDS (PLWHA) include feelings of stress during therapy, the emergence of opportunistic infections, side effects of antiretroviral therapy (ART), social stigma and community discrimination can affect the mental health of PLWHA (Hendrastuti, 2014).

Since it was first discovered until June 2018, HIV/AIDS has been reported by 433 (84.2%) of 514 districts/cities in 34 provinces in Indonesia. The cumulative number of HIV infections reported up to June 2018 was 301,959 people (47% of the estimated PLWHA number of people with HIV AIDS in 2018 were 640,443 people) and was most prevalent in the 25-49 years and 20-24 years age groups. The province with the highest number of HIV infections were DKI Jakarta (55,099), followed by East Java (43,399), West Java (31,293), Papua (30,699), and Central Java (24,757). (Hendrastuti, 2014)

Considering the prevalence of depression in HIV patients is very high, it is very important for clinicians to find out early and prevent depression in HIV patients so that morbidity and mortality can be suppressed by marked increases in CD4 levels.

Spirituality is closely related to a person's physiological or psychosocial health. Some studies show an important relationship between religion / spirituality and mental or physical health in patients with severe or chronic illnesses such as HIV which tends to experience psychological or social changes. (Dalmida, 2009)

Given that very few studies have investigated the relationship of spirituality with immunity that is characterized by CD4 levels and the occurrence of depressive symptoms, researchers are interested in conducting this study to determine the correlation of spiritual scores as measured by the Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale 12 (FACIT Sp 12) with CD4 levels in HIV patients suffering from depression.
The relationship between low CD4 cell counts and depression in patients with HIV positive still needs further research. The currently accepted theory is depression in HIV positive patients, especially with low CD4 levels caused by viruses that penetrate to the central nervous system after the immune system infected by the HIV virus migrates to peripheral blood mononuclear cells across the blood brain barrier, infects astrocytes, oligodendrocytes and progenitor neuronal cells (also known as the 'Trojan horse' hypothesis) (Nanni, et al., 2015).

Antiretroviral treatment with Efavirenz can cause side effects of suicide ideas, cognitive changes, headaches, dizziness, insomnia and nightmares. These symptoms can occur after 3 months of treatment except for people with HIV who have previous mood disorders, symptoms can appear more quickly. In serious cases, efavirenz administration must be stopped (Ministry of Health, 2014).

Method

Study design
This research was conducted observationally with a cross-sectional design. This research will begin in July 2019 until September 2019 or until the minimum sample size is met at the Haji Adam Malik General Hospital in Medan with the approval of the USU FK Research Ethics Commission.

Study Subjects
The study subjects were all HIV patients who came for treatment at the Special Service Center Clinic (Pusyansus) of the General Hospital of Haji Adam Malik Medan, over 18 years old, HIV positive, not yet

receiving ART, fulfilling depression criteria based on BDI score II, had no history of previous mood disorders, can understand the contents of the questionnaire and can communicate well, get information and give consent to participate in research voluntarily and in written (informed consent).

Procedure

- Patients have previously been diagnosed with HIV by 3 methods of HIV rapid test
- Demographic data such as age, gender, marital status, education, religion and occupation were obtained from the questionnaire. Clinical data regarding treatment were obtained from the patient's medical record.
- Patients were asked to fill out the Beck Depression Inventory questionnaire (BDI-II) which contained 21 questions filled in ± 10 minutes. Patients complete BDI-II alone or with family assistance.
- Patients are asked to fill out the FACIT Sp 12 questionnaire which contains 12 questions filled in ± 5 minutes. Patients complete FACIT Sp 12 alone or with family assistance.
- Blood sampling is taken for examination of CD4 levels in the Clinical Pathology Laboratory of the Haji Adam Malik General Hospital, Medan.

Data analysis

Analysis of the data used is univariate analysis by analyzing the frequency distribution of independent and dependent variables, while bivariate analysis is an analysis of the variables studied (independent) which are thought to have a relationship with the dependent (dependent) variable. The analysis uses the Pearson correlation test when the data are normally distributed. If the data is not normally distributed then the data is analyzed using the Spearman test.

Study result

This study involved 52 subjects with a mean age of 33 ± 8.5 years. Study subjects were dominated by men, with 35 subjects (67.3%) compared to 17 subjects (32.7%) women. In terms of ethnicity, the most ethnic groups wereBatak with 18 subjects (34.6%) followed by Javanese 16 people (30.8%), 6 people Malay (11.5%), Karo 5 people (9.6%), Chinese 2 people (3.8%), Mandailing 2 people (3.8%), nias 2 people (3.8%), and sumba 1 person (1.9%). A total of 33 people (63.5%) were employed compared to 19 people (36.5%) who did not work. As many as 29 people (55.8%) subjects were married followed by 20 people (38.5%) were not married and 3 people (5.8%) were widowed / widower. In terms of education, the description of the study subjects was dominated by high school education of 21 people (40.4%) followed by junior high school education of 19 people (36.5%), S1 / D3 of 11 people (21.2%), and elementary school 1 person (1.9%).

Table 4.1 Data Characteristics of study subjects HIV patients suffering from depression

Characteristic	Number (percentage) / mean ± SD (n=52)
Age	33±8.5
Gender	
Male	35 (67.3%)
Female	17 (32.7%)
Ethnic	
Batak	18 (34.6%)
Chinese	2 (3.8%)
Javanese	16 (30.8%)
Karo	5 (9.6%)
Mandailing	2 (3.8%)
Malay	6 (11.5%)
Nias	2 (3.8%)
Sumba	1 (1.9%)
Occupation	
Employed	33(63.5%)
Not employed	19 (36.5%)
Marital status	

Married	29 (55.8%)
Not married	20 (38.5%)
Widowed/widower	3 (5.8%)
Education	
Low	20 (38.4%)
High	32 (61.6%)
Depression	
Mild depression	14 (26.9%)
Moderate depression	13 (25%)
Severe depression	25 (48.1%)
Component of spirituality score	
Meaning	7.5±4.0
Faith	7.44±2.3
Peace	9.19±3.91
CD4levels	
<200	43 (82.69%)
>200	9 (17.3%)

This study shows that spiritual scores are significantly correlated with CD4 values, r = 0.822 and P = <0.001. In addition it was found that spiritual scores were negatively correlated with depression with r = -0,537 and P = <0.001. This study also showed a significant relationship between depression and CD4 cell count with a P value <0.05.

Table 4.4 Correlation Value of Spiritual and CD4

Variable	R	Value
Score of FACIT-CD4+	0.822	<0.001

Based on the table above, found the Spearman correlation coefficient FACIT Sp 12 score and CD4 levels were 0.822. This means that the correlation between the FACIT Sp 12 score variable and CD4 level is 0.822 or very strong.

Table 4.5 Correlation Value of Spiritual and Depression

Variable	R	P value
Score of FACIT – Depression	-0.537	<0.001

Based on the table above, found the Spearman correlation coefficient Sp 12 FACIT score and Depression of -0.537. This means that the correlation between the FACIT Sp 12 score variable and depression is -0,537 or negatively correlated.

Table 4.6. The relationship between depression and CD4 values

Variable	P value
Depression and CD4	<0.05

The table above shows a significant relationship between depression and CD4 value with a P value <0.05.

Discussion

Spirituality is a resource used by some HIV-positive patients to deal with HIV, and also may have a positive impact on physical health. (Dalmida et al., 2009) Spirituality has served as a protective psychological resource for HIV patients. The components of spiritual scores assessed in this study are meaning, faith, and peace.

The subject of this research is male dominance. This is in accordance with the report from the Directorate General of Disease Control and Environmental Health (DG PP & PL) Ministry of Health Republic of Indonesia 2014 which states based on the sex of HIV / AIDS sufferers more males than females and most incidents are found at productive age. In accordance with this study where the average age of the subjects was 33 ± 8.5 years.

Despite this, Reid-Ardnt et al reported that there were no differences in spiritual behavior, religious practice, and congregational support for men and women. (Reid-Arndt et al., 2011). The background of the subjects in this study also consisted of various ethnicities, occupational backgrounds, marital status and education. Race has a significant effect on one's spiritual score. (Canada et al., 2013) Other factors do not conclusively influence spiritual scores.

Spirituality can be measured by measuring how successful individuals are in the search for something meaningful by using criteria that are oriented to spirituality such as spiritual well-being. Spirituality can also be measured through mental health, physical and social life. (Peterman, 2002)

This study found that depression was significantly associated with CD4 + values. Cases of depression in PLWHA are estimated to have a frequency of up to 60% of the total depressed cases. This result is higher than the prevalence of depression in the general population, which is only about 5-10% of the total cases of depression. Continuous depression will cause a decrease in physical and mental condition, so that it can cause someone to be lazy to do daily self-care activities on a regular basis, as a result it will greatly affect the quality of life of PLWHA (Hapsari, et al., 2016). Psychological disorders can cause deterioration in the functioning of the mind, forgetfulness, lack of motivation and a lack of understanding of the therapeutic plan.

CD4 cell decline is associated with decreased sleep quality. The relationship between higher CD4 cell counts and poor sleep quality can reveal immune-reducing mechanisms that are the basis of HIV pathomechanism. Low CD4 levels cause an increase in HIV progression. Low CD4 levels make patients more susceptible to opportunistic infections so as to increase the incidence of depression in patients (Olisah, et al., 2015).

The relationship between low CD4 cell counts and depression in patients with HIV positive still needs further research. The currently accepted theory is depression in HIV positive patients, especially with low CD4 levels caused by viruses that penetrate to the central nervous system after the immune system infected by the HIV virus migrates to peripheral blood mononuclear cells across the blood brain barrier, infects astrocytes, oligodendrocytes and progenitor neuronal cells (also known as the 'Trojan horse' hypothesis) (Nanni, et al., 2015). This hypothesis is proven by neurological imaging studies that show an increase in cytokines that cause changes in the activation pattern of the basal ganglia. Proinflammatory cytokines reduce the bioavability of tryptophan, a brain serotoninergic neurotransmission that causes depressive symptoms (Nanni, et al., 2015).

The same result was reported by Damilda et al. who conducted a cross-sectional study examining the relationship of spiritual well-being, with depressive symptoms, and CD4 cell counts and percentages among nonrandom samples from 129 HIV-positive women who were predominantly African-American (AA). A significant inverse relationship was observed between depressive symptoms and spiritual well-being ($r = -0.55$, $p = .0001$), and its components, existential well-being ($r = -0.62$, $p = .0001$) and religious health ($r = -. 36$, $p = .0001$). A significant positive association was observed between existential well-being and CD4 cell count ($r = 0.19$, $p < 0.05$) (Dalmida et al., 2009)

There is no mechanism that specifically explains the relationship between spiritual and CD4+ values. The spiritual relationship and CD4+ value hypothesized can be explained by an intermediate factor, namely depression. On the other hand, the relationship between low CD4 cell counts and depression in HIV positive patients to date still requires further research.

Idrus et al in 2016 found that the influence of spiritual psychotherapy on T-CD4 cell counts. In this study with a sample of 40 people with HIV / AIDS, found a significant increase in serum CD4 cell count in HIV/AIDS patients with intensive spiritual psychotherapy. Meditation will evoke a relaxation response that will work through psychoneuroimmunology.

Psychoneuroimmunology is a scientific system that connects medical psycho (emotions, thoughts), neuro (reflexes, neuroendocrine), immunology (cellular immune system and humoral immune system). The relationship between these three systems is the time to maintain body homeostasis. This relationship is through

two subsystems, namely, hypothalamus-pituitary-adrenal (HPA axis) and autonomic nervous system (Idrus, et al., 2016).

This is consistent with our study which showed a significant negative correlation of moderate power between depression and spiritual scores. The study also found that spiritual scores had a strong positive correlation with CD4+ levels in HIV / AIDS patients.

Psychotherapy is believed to function to improve the development of cognitive, emotional, and behavioral skills. (Idrus, et al., 2016). Psychotherapy also enhances neuronal development and neural network integration. Changes that occur in the brain are in line with changes in glucose metabolism, neurotransmitter concentration and blood flow, which in turn increases the immune system (CD4).

God gives us a feeling of calmness and peace. The mechanism of spiritual healing is through two psychotherapy pathways, namely the hypothalamus-pituitary-adrenal (HPA axis) and the autonomic nervous system (SSO). The HPA axis is a stress management system that aims to maintain the body's homeostatic state through the control of the hormone cortisol, the HPA axis, and cytokines that influence each other (Idrus, et al., 2016). A similar study was obtained by Oji et al in 2017, which found a link between spiritual support and better HIV/AIDS management outcomes. (Oji, et al., 2017). Ironson et al reported that HIV patients with good spiritual transformation tended to survive 5.35 times more in 5 years than without spiritual transformation. (Ironson et al., 2009).

Conclusion

- Spiritual scores correlate significantly with CD4+ levels in HIV patients suffering from depression at Haji Adam Malik General Hospital Medan.
- HIV patients suffering from depression at the Haji Adam Malik General Hospital Medan are more male than female with an average productive age and marital status followed by most unmarried and widowed. In terms of education, HIV patients who suffer from depression at the Haji Adam Malik General Hospital in Medan are generally highly educated and have jobs.
- Degree of depression of HIV patients suffering from depression at Haji Adam Malik General Hospital Medan is the most severe depression, followed by moderate depression and mild depression.
- The mean CD4 level of HIV patients suffering from depression is 98.11 ± 94.54 (<200 cells / mm3) which represents a severe decrease in cellular immunity.
- Spiritual scores are negatively correlated with depression in HIV patients suffering from depression at Haji Adam Malik General Hospital Medan.

Strengths and Limitations of study

This study is the first study in Indonesia to assess the correlation of spiritual scores with CD4 levels in HIV patients suffering from depression. However, this study also has limitations, among others, this study can only explain the correlation without having a causal meaning and also in this study did not use a comparison of patients not depressed to see the comparative relationship. In addition, this study carried out CD4 examinations at two different laboratory sites.

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