

Description of Viral Load in HIV Patients Receiving ARVS in Klungkung Regency Hospital

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Abstract: *Human immunodeficiency virus (HIV) is a viral infection that attacks the body's immune system. Meanwhile, acquired immunodeficiency syndrome (AIDS) is the highest stage of this infection. HIV targets white blood cells, which weaken the body's immune system. Viral load and CD4 counts are markers used to see the response to ARV therapy and disease progression in HIV patients. Viral load examination can be used to detect earlier and more accurately in patients who experience treatment failure compared to using immunological or clinical criteria. Viral load examination can also be used to determine the level of viral replication and as data to decide on changing therapy from first line to second line therapy so clinical outcomes can be better. The design of this study is a descriptive observational. The sample in this study was 155 patients at Klungkung Regional Hospital who were diagnosed with HIV/AIDS and had been undergoing treatment for >6 months. From the study, data was obtained from 155 samples, 143 (92.3%) respondents had suppressed viral loads and 12 (7.7%) respondents were not suppressed. This result cannot be separated from the benefits of using ARVs as early as possible. And these results are in accordance with the HIV Prevention Trial Network Study, state that ARV therapy is the most effective prevention of HIV transmission at this time, so that early administration of ARVs can reduce HIV transmission by 93% in non - HIV sexual partners (serodiscordant couples).*

Keywords: HIV, AIDS, viral load, CD4 counts, ARV therapy

1. Introduction

Based on the Sustainable Development Goals (SDGs), overcoming and suppressing HIV AIDS transmission is one of the components to be achieved. Where this is related to achieving health and prosperity for everyone (point three). To achieve these holistic goals, one of the targets to be achieved is ending the AIDS epidemic as a threat to public health and ending the AIDS epidemic by 2030.¹

Human immunodeficiency virus (HIV) is a viral infection that attacks the human body's immune system. Meanwhile, acquired immunodeficiency syndrome (AIDS) is the highest stage of this disease. HIV's target is leukocytes or what we know as white blood cells, which weaken the body's immune system. So that the patients with HIV will be very easily attacked by other diseases which are then known as opportunistic diseases.²

Forty years have passed since HIV was first discovered and isolated, HIV is still a global health problem. It is stated that currently there are 40.4 million patients living with HIV worldwide, with several countries reporting an increase in HIV transmission from year to year. By the end of 2022, it is estimated that there will be 39 million HIV sufferers worldwide. In 2022, it is also stated that 630, 000 people will die from HIV and HIV - related diseases.^{2,3}

Based on Riskesdas 2022, the number of HIV in Indonesia as of March 2022 is 466, 978 people. With reporting of 10, 525 new cases from 2021. The largest percentage is in the productive group, the age between 25 - 49 years and is dominated by male at 63%. For Bali, in 2022 rank at 6th after DKI Jakarta, West Java, East Java, Central Java and Papua with a total of 25, 292. But for AIDS, Bali is in 5th place after Papua, East Java, Central Java and DKI with a total of 9, 728 in 2022.⁴

Although currently there is no definitive therapy to cure HIV infection, the use of therapy to avoid opportunistic infections and further transmission has been used. ARVs treatment which are recommended to be taken after an HIV diagnosis is established. The main goal of ARVs (Antiretrovirals) is to suppress the viral load of the HIV virus to become undetectable. Undetectable viral load in HIV patients provides several benefits, which are reducing opportunistic infections, improving quality of life, and reducing mortality rate. Decrease in viral load can also reduce the patient's ability to transmit the HIV virus. At the community level, suppression of viral load has the potential to reduce HIV incidence because it reduces the ability to infect others. This is often called "treatment as prevention". Suppression of the HIV virus, beside improving immune function, can also improve the patient's quality of life, as well as reducing the risk of AIDS and non - AIDS complications and extending the patient's life expectancy.^{5,6}

Viral load and CD4 counts are markers used to see the response to ARV therapy and disease progression in HIV patients. Viral load examination is also more accurate in detecting therapy failure than using immunological or clinical criteria. Viral load examination is also used to see viral replication as data to determine changing therapy from first line to second line so it will obtain better clinical outcomes. Studies state that 70% of patients who receive first - line ARVs with high viral loads will experience a reduction after receiving ARV intervention accompanied by therapy compliance. Viral load can also be used to determine the risk of transmission, especially in pregnant patients. Even though checking the patient's viral load is very useful in HIV patients, viral load testing is very rarely done, apart from the high price of the test, the laboratory providers are also very rare.⁶

Based on the problem above, it is necessary to conduct research on "Description of the Viral Load of HIV Patients

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in ARV Recipients at Klungkung Regional Hospital”.

2. Research Methods

This study used a descriptive observational design, and the data used was secondary data from patient electronic medical records from January 2023 to August 2023 that obtained from the VCT polyclinic at Klungkung Regional Hospital. The population is HIV positive patients receiving ARV therapy, who have their viral load checked. Inclusion criteria were HIV positive patients who were controls at Klungkung Regional Hospital, HIV patients and ARV recipients >6 months at Klungkung Regional Hospital, patients who had Viral load checked. The exclusion criteria in this study were patients who did not meet the inclusion criteria and missing data. Through sample size calculations, a minimum sample of 110 samples was obtained.

Viral load is a marker used to see the response to ARV therapy in HIV patients. This examination was carried out 6 months after treatment, then 12 months after treatment, and every 12 months.18 In this study, the viral load was expressed in units of copies per milliliter (mL) of blood. The viral load results are then categorized into suppressed and not suppressed. The data collected comes from each patient's medical record, then the data is input into Microsoft Excel. The data is then analyzed univariately, then the data presentation will be displayed in table form.

3. Result

Table 5.1: Frequency distribution of respondents based on gender in patients receiving ARV therapy at Klungkung Regional Hospital

Sex	Frequency	(%)
Male	93	60
Female	62	40
Total	155	100
Age		
Children	4	2.6
Adult	92	59.4
Pra - elderly	51	32.9
Elderly	8	5.2
Total	155	100
Length of Treatment		
<24 months	56	36.1
24 - 60 months	54	34.8
> 60 months	45	29
Total	155	100

Based on table 5.1, the gender most of the respondents was 93 men (60%) and 62 women (40%). Most of the respondents in this study were 92 adults with percentage of 59.4% and the lowest were children, which is 4 people and the percentage is 2.6%. Based on the duration of ARV therapy, found that the majority of respondents had undergone therapy <24 months, 56 people (36.1%)

Table 5.2: Frequency distribution of viral load results in ARV therapy recipients at Klungkung Regional Hospital

Viral Load	Frequency	(%)
Suppressed	143	92.3
Not suppressed	12	7.7
Total	155	100

From table 5.2, it was found that in the viral load examination carried out on 155 respondents, 143 (92.3%) respondents found that the viral load was suppressed and 12 (7.7%) respondents were not suppressed.

Table 5.3: Frequency distribution of age on viral load results in patients receiving ARV therapy at Klungkung Regional Hospital

Usia	Viral Load Result Total		Suppressed		Not suppressed	
	Frequency	%	Frequency	%	Frequency	%
Children	2	50	2	50	4	100
Adult	85	92.4	7	7.60%	92	100
Pra elderly	48	94.1	3	5.9	51	100
Elderly	8	100	0	0	8	100
Total	143	92.3	12		155	100

From table 5.3, it can be seen that the frequency of viral load results in children is balanced between suppressed and not suppressed, 2 people (50%) are suppressed and 2 people (50%) are not suppressed. Meanwhile, in adults, 85 people (92.4%) had suppressed viral load results and 7 people

(7.6%) were not suppressed. In the pre - elderly age range, 48 people (94.1%) experienced suppression of viral load results and 3 people (5.9%) were not suppressed. And in the elderly population, the viral load results were suppressed, 8 people (100%).

Table 5.4: Frequency distribution of duration of therapy on viral load results in patients receiving ARV therapy at Klungkung Regional Hospital

Length of Treatment	Viral Load Result Total		Suppressed		Not Suppressed	
	Frequency	%	Frequency	%	Frequency	%
<24 months	53	94.6	3	5.4	56	100
24-60 months	49	90.7	5	9.3%	54	100
>60 months	41	91.1	4	8.9	45	100
Total	143	92.3	12		155	100

From table 5.4 it can be seen that the frequency of suppressed viral load results in therapy for <24 months was 53 people (94.6%) and in samples who had undergone therapy for 24 - 60 months it was 49 people (90.7%) and those who had undergone therapy >60 months and suppressed on viral load examination as many as 41 people (91.1%).

4. Discussion

From 155 samples who underwent viral load testing based on gender, is dominated by 93 male patients (60%) and 62 female patients (40%). The high number of male HIV patients is also due to the increase in the number of men who have sex with men (MSM). MSM is the third cause of HIV transmission.¹³ This data is also supported by research conducted by Nurhayati et al state that patients who have male sex have a 1.97 times higher risk of suffering from HIV than those who do not.

From the age characteristics in this study, it was found that the dominant age was the adult group with an age range of 19 - 44 years, 92 people (59.4%). The results of the study are in accordance with Rohmatullailah and Fikriyah's research where HIV occurs mostly in the productive age group, between 25 - 49 years.²³ HIV transmission has a higher risk in the productive age group, this is because in this group most infections are active.¹¹

In this study, the largest number of respondents were patients who had received ARV therapy for <24 months, it is 56 (36.1%) people. Currently ARV therapy is given to all patients without looking at the patient's CD4. Where the level of viral load that is suppressed by using ARVs is related to the concentration of the virus. And using ARVs as a prevention effort is part of treatment as prevention.¹⁹

From this study on 155 samples, 143 (92.3%) respondents had suppressed viral loads and 12 (7.7%) respondents were not suppressed. The HIV Prevention Trial Network study stated that currently ARV therapy is one of the most effective measures to prevent HIV transmission. Early administration of ARVs will reduce HIV transmission by 93% in non - HIV sexual partners (serodiscordant couples).¹⁹

In the distribution of viral load results according to patient age, the frequency of viral load results in children is balanced between suppressed and not suppressed. There are 2 people (50%) are suppressed and 2 people (50%) are not suppressed. Children and adolescents who initiate ART have a greater chance of not achieving viral suppression compare to other age group. This can be caused by behavioral factors, such as not taking medication every day and according to the medication prescription, or due to structural problems such as not being able to visit health facilities on weekdays because of school, it could also due to children and adolescents having low self - awareness in treatment.²⁴

In the distribution of duration of therapy on viral load results, the frequency of suppressed viral load results in therapy for <24 months was 53 people (94.6%) and in samples who had undergone therapy for 24 - 60 months, 49

people (90.7%) were suppressed and in There were 41 samples who had undergone therapy >60 months and were suppressed on viral load examination (91.1%). There are several factors that can influence the reduction in viral load results even though ARV therapy has been given. One of them is the viral load blip phenomenon. Blip Viral Load is defined as a transient, low - level increase in HIV viral load followed by a return to suppression without a change in therapy. Proposed explanations for the appearance of blips include temporary increases in virus production due to fluctuations in compliance, concurrent flu - like illness or healthy response to vaccination, and artifacts due to variability in the Viral Load assay.²⁵

5. Conclusion

In this study, data was obtained from 155 samples, 143 (92.3%) respondents had suppressed viral loads and 12 (7.7%) respondents were not suppressed. These results are in accordance with the HIV Prevention Trial Network Study which states that currently ARV therapy is one of the most effective measures to prevent HIV transmission. Early administration of ARVs can reduce HIV transmission by 93% in non - HIV sexual partners (serodiscordant couples). The sample in this study consisted of 93 men (60%) and 62 women (40%). Most of the respondents in this study were adults, 92 people (59.4%), and the lowest were children, 4 people (2.6%). Based on the duration of ARV therapy, respondents in this study found that the majority of respondents had undergone therapy <24 months, which is 56 people (36.1%).

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