

The effect of Anti Retrovirus Therapy regimens on viral load and Hemoglobin in Sudanese patients whom suffered from HIV/AIDS

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Abstract: Introduction: Before people start antiretroviral therapy (ART), health-care providers should initiate a detailed discussion about the willingness and readiness of patients to initiate ART, the antiretroviral (ARV) drug regimen, dosage, scheduling, likely benefits, possible adverse effects, has historically been based on clinical indications, such as viral load and Hemoglobin estimation the required follow-up and monitoring visits. **Objective:** The aims of this study to evaluate the effect of Anti Retrovirus Therapy regimens on viral load and Hemoglobin in Sudanese patients who suffered from HIV/AIDS. **Materials and Methods:** A cross-sectional center-based study conducted in 100 patients of ART Center in Medani Teaching Hospital, Statistical analysis was performed using SPSS statistical software trial version 22. The P. Value < 0.05 was considered as statistically significant. **Result:** About 100 HIV patients were included in this study; HIV positive under treated, were assessed in ART center in Medani Teaching Hospital, with males accounting for about (44%) and females accounting for about (56%), Patients ranged categorized into four hemoglobin estimation group; 44 normal from (13.2g/dl - 16.6g/dl) for male and (11.6g/dl - 15g/dl) for female; 43 mild (10g/dl to levels within normal limit); 9 moderate (8.0 – 10g/dl); 4 sever. Analysis of viral load count in the present study the test accounts the viral load before and after initiating the ART 100, There were decrement in viral load after treatment in this study (P-value = 0.000 highly significant), The rate at which this happens can vary a lot between individuals. In some people, it can take months or even years for their viral load count to climb towards normal levels for people of their age. The mean value viral load count before ART was 34431.58 and after initiating the ART, the mean value of viral load count decreased to 811.35. **Conclusion:** In this study there's very good evidence that the HIV treatment available today will work against the virus in the long term and keep the viral load undetectable indefinitely, the treatment not working is likely to mean that viral load and hemoglobin will increase and your CD4 cell count, an important indicator of the health of immune system, will fall. This situation increases your chances of becoming ill because of HIV. There is significant effect of Anti Retrovirus Therapy on viral load and Hemoglobin. These findings may be helpful to HIV-positive individuals and their attending physicians in understanding disease progression.

Keywords: HIV – AIDS - Anti-Retrovirus Therapy – Hemoglobin -viral load – Sudanese.

Introduction

Infection with the HIV virus affects more than 33 million individuals worldwide. Highly active antiretroviral therapy (HAART) is now widely available, yet many people who require it are still untreated, particularly in sub-Saharan Africa. South Africa has the biggest population of people living with HIV, with more than five million people there. South Africa presently has the highest proportion of patients receiving HAART worldwide as a result of the political commitment made to include HAART in the Comprehensive Care, Management and Treatment program of the public health sector beginning in April 2004. The scale-up of HAART has been slower than anticipated, and there are still more than 500,000 people without access to treatment. In the first year of HAART, antiretroviral treatment roll-out clinics in sub-Saharan Africa achieved clinical, immunologic, and virologic outcomes comparable to those seen in industrialized nations. About the long-term effects of these widespread roll-outs, little is known. According to a recent analysis of ART programs in sub-Saharan Africa, only 60% of those starting HAART are still receiving treatment by the end of the second year due to loss to follow-up and mortality. Thus, there is a valid worry that focusing on the quantity of people starting HAART may degrade the standard of care (Seifu, *et al*, 2018). One of the most crucial metrics to track ART is routine viral load monitoring, which is the primary way for determining if a therapy has been successful. Within 8 to 24 weeks of starting ART, HIV-positive patients should see viral suppression in the absence of drug resistance. Since HIV-positive individuals may benefit from treatments to increase ART adherence, such as rigorous adherence counseling, accurate and early detection of virologic failure is essential (Mbengue, *et al*, 2019). The measuring of HIV-load over time is a key component of the conventional method for tracking treatment outcomes in patients on ART. The WHO guidelines state that virological failure occurs when patients continue to have a viral load greater than 1000 copies/ml after receiving ART for 6 to 12 months. In most cases, the persistently elevated viral load is caused by non-adherence (Chendi, *et al*, 2019).

This study's goal was to evaluate the level of ART in relation to viral load and hemoglobin in Sudanese patients with HIV/AIDS receiving care at HIV centers in the wad medani region. When making therapeutic decisions about when to move to second-line therapy and how to lengthen the course of first-line therapy, viral load monitoring may become more crucial. Additionally, the viral load can be used to diagnose HIV infection in children less than 18 months, perform sentinel surveillance, and assess treatment

adherence. Instead than viewing viral load data as an expensive luxury, efforts should be made to make viral load testing accessible, straightforward, and simple to utilize in environments with constrained resources (de Necker *et al.*, 2019). Overall, ART for HIV infection lowers the frequency of anemia and gradually raises hemoglobin levels (Woldeamanuel, *et al.*, 2018). Due to clinical treatment failure, toxicity, resistance, new TB, drug out of stock or other reasons (specify), it is very important to check the viral load and Hemoglobin because if the increase or not, this indicates the patient continuous, stop ART or other reason. Research in the field of HIV/AIDS is becalmed widely and directed for both economical and healthy in Sudan. So, this could be a trail on laying down the basis for future, research and development in this field.

Material and Methods

Cross-sectional study includes 100 samples. HIV/AIDS involved in this study were selected randomly 100 HIV positive under treated. Blood samples were taken from patient in ART center in medani teaching hospital. The questionnaire used in this study had been designed to be suitable as a rapid means of identifying viral load and Hemoglobin and risk factor associated with HIV infection among study population. Data will be collected by using doctor’s report and other finding.

Ethical clearance

Ethical clearance was obtained from the faculty research committee of university of Gezira, ministry of health - Gezira state and from each participant. Since it was a retrospective analysis of the identified data, a waiver of consent was obtained. Even though most of the data were collected from the patient chart and follow-up card, a written patient consent form without any personal identifiers was prepared.

Result

Table (1) Hemoglobin estimation

	Frequency	Percent	Valid Percent	Cumulative Percent
Normal	44	44.0	44.0	44.0
Mild (within normal limit)	43	43.0	43.0	87.0
Moderate	9	9.0	9.0	96.0
Sever	4	4.0	4.0	100.0
Total	100	100.0	100.0	

Table (2) viral load before and after initiation of ART

Pair 1		Mean	N	Std. Deviation	P. Value
V.load1		34431.58	100	35526.085	0.000
V.Load2		811.35	100	3435.048	

Table (3) Correlations between hemoglobin and viral load first initiation - hemoglobin and viral load out come

		Hb	V.load1	V.Load2
Hb	Pearson Correlation	1	.106	.156
	Sig. (2-tailed)		.295	.120
	N	100	100	100
V.load1	Pearson Correlation	.106	1	.478**
	Sig. (2-tailed)	.295		.000
	N	100	100	100
V.Load2	Pearson Correlation	.156	.478**	1
	Sig. (2-tailed)	.120	.000	
	N	100	100	100

Discussion

About 100 HIV patients were included in this study; were HIV positive under treated, were assessed in ART center in Medani Teaching Hospital, with males accounting for about (44%) and females accounting for about (56%), Patients ranged categorized into four hemoglobin estimation group; 44 normal from (13.2g/dl - 16.6g/dl) for male and (11.6g/dl - 15g/dl) for female; 43 mild (10g/dl to levels within normal limit); 9 moderate (8.0 – 10g/dl); 4 severe, and this finding was agreed with Gebremedhin, *et al.*,2019 the overall anemia prevalence was 34.6%, while about 5%, 15.6%, and 14% of the patients had severe, moderate, and mild prevalence of anemia, respectively. Factors that were found to affect anemia among these patients include gender. These data have an important implication because they indicate the need to start treatment to reduce the burden of anemia and this result was near to result obtained

by Amanda Marchionatti, Mariana Migliorini Parisi, 2021. Analysis of viral load count in the present study the test accounts the viral load before and after initiating the ART 100, There were decrement in viral load after treatment in this study (P-value = 0.000 highly significant) this finding similar to Li, *et al*, 2022, All participants suppressed after ART reinitiating. The rate at which this happens can vary a lot between individuals. In some people, it can take months or even years for their viral load count to climb towards normal levels for people of their age. The mean value viral load count before ART was 34431.58 and after initiating the ART, the mean value of viral load count decreased to 811.35 this result is similar to Stockdale, *et al*, 2018 initial antiretroviral treatments for HIV-1 to date appear to have suboptimal long-term efficacy, but are more effective when commenced at plasma viral loads <100,000 copies/mL. Rising viral load should be considered an indication for starting treatment. Integrase inhibitors offer a treatment advantage.

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