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Original Research Paper

Microbiology

A STUDY OF HIV VIRAL LOAD AMONG PATIENTS ATTENDING ART CENTRE AT TERTIARY CARE HOSPITAL (M.B .GOVERMENT HOSPITAL)IN UDAIPUR,RAJASTHAN

Dr. Neelam Chauhan*	PhD Scholar, Department of Microbiology,RNT Government Medical college,Udaipur, Rajasthan, India. *Corresponding Author
Dr. Anshu Sharma	Senior Professor & Head of Department, Department of Microbiology, RNT Government Medical college,Udaipur,Rajasthan, India.
Madhubala Mishra	PhD Scholar, Department of Microbiology, RNT Government Medical College,Udaipur, Rajasthan, India.
Dr. Neera Samar	Senior Professor & Nodal officer ART, Department of Medicine, RNT government Medical college, Udaipur, Rajasthan, India

ABSTRACT

Introduction: The most terrible illness and a significant global health problem affecting people is the HIV infection.Quantification of HIV-1 Ribonucleic acid (RNA) copies per millilitre of plasma (i.e.,viral load) is used as a marker of risk of disease progression and it is the most important indicator of successful antiretroviral therapy. **Aim:** To assess plasma viral load in HIV-seropositive patients. **Material & Methods:** A total of 300 HIV Seropositive cases,all above the age of >15 years attending the ICTC in the Dept. of Microbiology were studied for a period of 20 months,In our Study the Viral load estimated after 6 months and 12 months of Post ART.RNA extraction and then HIV-1 Viral load was done by Abbott Real Time HIV-1 viral load kit on m2000rt/sp instrument. **Results:** out of total 300,only 269 patients could be followed-up,in which 55(20.44%) patients had plasma viral load <1000 copies/ml and 38(14.12%) patients had plasma viral load of >1000 copies/ml after 6 months of treatment.Viral load was suppressed (<1000+ TND) in 254 (94.42%) patients, but still 15 (5.57%) patients had a viral load of more than >1000 copies/ml.Mean Baseline viral load was 13979.38±102041.74 which reduced to 3278.27±37602.07 after 12 months.The mean viral load in genders was reduced.Females was showing better response than males in longer duration. **Conclusion:** The use of routine viral load led to early identification of treatment failures and referrals to second- and third-line regimens, while also preventing unnecessary switches.

KEYWORDS : Viral load, Viral load suppression, HIV patients, antiretroviral treatment

INTRODUCTION:

The most terrible illness and a significant global health problem affecting people is the HIV infection/Acquired Immunodeficiency Syndrome (AIDS).Forty years have passed since the human immunodeficiency virus (HIV) was first detected in transfused patients toward the end of 1982,isolated and within a decade AIDS was killing millions around the world. Globally there were 37.7 million PLHIV1.The Indian epidemic is still a concentrated epidemic with high HIV prevalence remaining in the high-risk groups2.

The amount of HIV-1 RNA present in one millilitre of plasma is referred to as the HIV-1 viral load.Plasma viral load, as opposed to the virus inside the cell, shows the extent of virus replication and frequently the development of the disease.As a result, it serves as a very helpful manual for beginning therapy and tracking the effectiveness of antiretroviral medications.Every six months, or more frequently if ART is changed,HIV RNA levels should be checked.It is the most important indicator of successful ART 3.

Since2017,The National Program has advocated treating everyone,regardless of clinical stage or CD4count 4.The restoration of immunological functions and the maximum and long-lasting reduction of plasma viral levels are the main objectives of ART. Reduced transmissibility and fewer new infections are also caused by the reduction in viral load5.

AIM:

To assess Plasma viral load in HIV seropositive patients.Objective:Patients were confirmed for HIV-1seropositivity according to NACO guidelines.CD4 counts estimation was done in every 6months as per standard protocol.

MATERIAL & METHODS:

A Prospective hospital-based study was conducted on 300 HIV-seropositive ART patients of ≥15 years of age attending the ICTC, Department of Microbiology at a tertiary care hospital from November 2020 to June 2022,were screened for eligibility and enrolled for this study.Ethically approval had taken.Blood samples were collected after proper counselling and after obtaining written informed consent from each patient then 3 to 4 ml of blood was withdrawn aseptically from each client and done testing for viral load.

Quantitative Polymerase Chain Reaction was used to determine HIV RNA levels.HIV-1 viral load was determined using the Abbott Real Time HIV-1 viral load kit on the m2000rt/sp instrument.In our study, we had done tests of the viral load counts after 6 months and 12 months of Post ART.

RESULTS:

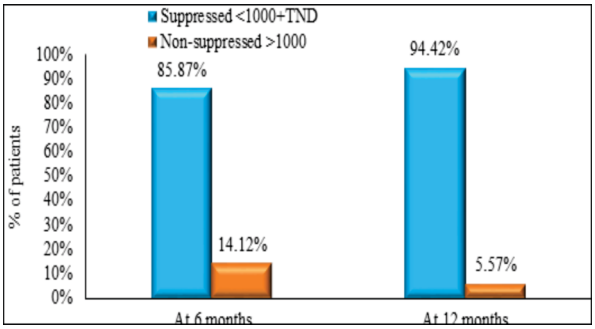
This study was conducted on 300 HIV serologically confirmed cases.Out of 300 cases,31 patients were lost to follow up (LFU) during study,so after 12months remaining 269 patients were followed-up.our results findings were as follows:

Table 1: No. of patients of plasma viral load after 6 and 12 months (n=269)

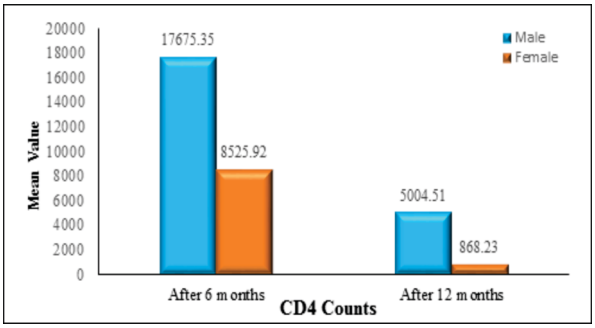
PVL (copies/mL)	At 6months	At 12months
	No. of patients (%)	No. of patients (%)
<1000	55 (20.44%)	20 (7.4%)
TND (Target not detected)	176 (65.42%)	234 (86.98%)
>1000	38 (14.12%)	15 (5.57%)
Total	269	269

Table 2: Mean viral load at various interval as 6 and 12 months (n=269)

	Time period	n	Mean ±SD
Viral Load	Mean after 6 months ± SD	269	13979.38±102041.74
	Mean after12 months ± SD	269	3278.27±37602.07



Graph 1: Viral load suppression(<1000 VL+TND) and Non-suppression(>1000 copies/ml) after 6 and 12 months of post ART initiation (n=269)



Graph 2: Gender wise Distribution of mean viral load count at 6and 12months

DISCUSSION:

Table 1 showed that there were 176 (65.42%)patients had achieved TND(Target not detected),55(20.44%) had <1000 copies/ml and 38 (14.12%) had >1000 copies/ml after 6months of ART.So total 85.87% patients had virologically suppressed (<1000 +TND copies/ml) and 14.12% had Non-suppressed (>1000copies/ml) at 6months of ART as seen in Graph 1.This is concordance with Wakooko P et al 6 [85.7 % sup. and 14.3% non-supp.]Shidhay P et al 7(87.3% supp. and 12.7% non-supp.).The overall prevalence of virological suppression among adults receiving antiretroviral therapy in our study was similar to prior studies.After 12months of ART, these patient's no. decreased from 55 to 20 (7.4%) had <1000 copies/ml and from 38 to 15 (5.57%)patients had >1000 copies /ml and 234 (86.98%)patients had increased upto TND that means 94.42% patients had suppressed VL(<1000+TND) and only 5.57% had non suppressed VL(>1000copies/ml)which is indication good ART response.This study is supported by Lameshwar C et al 8 (92% supp. and 8% non- supp.) and Abdullahi bello S et al 9(90.4% sup. and 9.6% non-supp.)On chi-square test show statistical highly significance (<0.0001).Developing countries have reported prevalence ranging from 9% to 13% for virologically non-suppression among PLHIV accessing ART.This may be attributed to the differences in study design, age groups,duration on ART,drug regimen, treatment adherence,study period and definition of virological failure considered for analysis in all these studies.

Table 2 depicted Mean baseline viral load after 6months of ART was 13979.38±102041.74 which reduced to 3278.27±37602.07 after 12months of ART.Abdullahi bello S et al 9,Khan A et al 10 reported almost similar result.Advani M et al 11reported high mean baseline viral load was 394499.92±119516.285 copies/mL and mean latest viral load was 226389.83±110193.495 copies/mL.Panda J et al 12 reported high VL (194746.2791 ± 550442.61805.The high viral load in patients may be due to repeated contact with HIV individuals and They had done tests in ART naïve patients,sbut we had done VL test in patients who were taking drugs from 6months.Adherence to ART drugs is the only predictor of viral load suppression or lesser no. of copies.

In Graph 2 as shown Mean viral load count in males after 6 months of ART was 17675.35±127289.58 and in females was 8525.92±49952.11.But the trend was reduced after 12 months of ART.In males was 5004.51 ±49243.65 and in females was 868.23±4592.50.it's showing better response in females than males in longer duration.Better immunological response in female could reflect the feminization of the HIV epidemic, better health seeking behavior of women and possibly the linkage of treatment sites with the antenatal clinics and the prevention-of-mother-to-child HIV programs resulting in better immune recovery.

Our finding of PVL is lower than study reported by Kumar M et al 13(M: 50103.10;F:63297.47),Shah H G et al 14 (M:32,446 copies/mL; F:20,786).Haokip et al 15 observed the mean PVL was 157,870 copies/mL in the males but only 67,057 copies/mL in the females.The difference of PVL between this study and other studies is observed, because in current study PVL was done after 6 months of ART.These all studies done in HIV naïve patient who were not yet taking ART drugs so their mean viral load in patients was higher than our study.High baseline plasma viral load can affect prognosis, disease progression and transmission.It was statistically Non –significant (p >0.05).

CONCLUSION:

Viral load monitoring is the preferred approach to access treatment efficacy and detect adherence problems.The use of routine viral load led to early identification of treatment failures and referrals to second- and third- line regimen, while also preventing from unnecessary switches.Therefore, the study recommends;Newer management strategies integrated with the existing HIV programme, continuing follow-up patient centric care can help in leveraging existing early detection and management of virological failure among people living with HIV.

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