Adherence level to antiretroviral therapy predict the time to viral load suppression of adult people living with HIV on antiretroviral therapy in Arba Minch general hospital

Sultan Hussen[1], Mohammedaman Mama[2], Bitewu Mekonnen[3], Manaye Yihun[1], Mulugeta Shegaze[1], Negussie Boti[1], Mohammed Shure[4], Kabtamu Tolossie[5]

[1]Department of Public Health, College of Medicine & Health Sciences, Arba Minch University, Arba Minch, Ethiopia;
[2]Department of Laboratory, College of Medicine & Health Sciences, Mada-Walabu University, Bale Goba, Ethiopia;
[3]Department of Nursing, College of Medicine & Health Sciences, Arba Minch University, Arba Minch, Ethiopia;
[4]Department of English Language and Literature, College of Social Sciences and Humanities, Arba Minch University, Arba Minch, Ethiopia;
[5]Department of Statistics, College of Natural Sciences, Arba Minch University, Arba Minch, Ethiopia.

To the Editor: Access to antiretroviral drugs for all human immunodeficiency virus (HIV) infected persons in need is a global health priority. The primary goal of initiating antiretroviral therapy (ART) among HIV patients is to suppress HIV viral replication and to restore immune function.[1] The viral load and CD4 counts should be monitored regularly and that plasma viral load should be reduced as much and as short as possible.[2] Poor adherence to ART leads to antiretroviral agents not persists at adequate concentrations to suppress HIV replication in infected cells to lower the plasma viral load.[3] Identifying factors like adherence to HIV treatment that predict time to viral load suppression of patients on antiretroviral therapy regimens is thus vital to optimizing therapeutic success.

Thus, we conducted an observational clinic-based follow-up study using prospective data abstracted from medical records, patient interviews and laboratory work-up during 6-month follow up of HIV patients in Arba Minch Hospital from March 1, 2017 to February 28, 2018. The letter of ethical clearance was obtained from the institutional review board (IRB) of College of Medicine and Health Sciences of Arba Minch University. Written consent was obtained from all study participants for blood draws and interviews. The confidentiality and privacy of participants were actively protected. The data were collected from 152 naive HIV infected patients. The specimen for the laboratory tests of CD4 count and viral load were collected by the trained laboratory staff at the facility. For both tests 4–5 mL of whole blood was drawn from each participant using vacutainer tube separately with anticoagulant following standard veni-puncture protocols for viral load testing. Furthermore, plasma sample was assayed for the presence of HIV RNA using Amplicor Monitor standard assay, version 1.5 (Roche Molecular Systems, Switzerland).

According to World Health Organization (WHO) strategy for the surveillance and monitoring of HIV drug resistance in low and middle income countries (LMICs), a viral load of < 1000 RNA copies/mL were taken as evidence of viral load suppression. Based on this recommendation of WHO, we found that the median time that take to reach the patients viral load suppression was three months with 95% of CI (2.68, 3.32) during six months of follow-up. The median viral load was 1452 copies/mL (IQR 1120 –3407.25 copies/mL). The minimum number of the viral load was 456 copies/mL and the maximum number was 455, 896 copies/mL. The average viral load of the patient strictly decreased from baseline to the second month and then slightly decreased from month 2 to month 6. This time to viral load suppression was significantly affected by the level of patient adherence to ART. The hazard rate for those who have good adherence to ART drug were 3 folds higher to experience early viral load suppression as compared to those who have poor adherence to ART drug (adjusted hazard ratio (AHR) = 2.648, 95% CI = 1.202, 5.834, $P = 0.016$). This finding is supported by the previous findings that adherence is the key, potentially modifiable, variable associated with time to viral load suppression.[4]

We also identified the supportive HIV treatments like cotrimoxazole preventive therapy (CPT) and isoniazid

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Correspondence to: Sultan Hussen, Department of Public Health, College of Medicine & Health Sciences, Arba Minch University, Arba Minch, Ethiopia
E-Mail: Sultanhussn@gmail.com

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preventive therapy (IPT) have a significant effect on the duration of viral load suppression. The effect of CPT on time to viral load suppression might be due to early initiation of cotrimoxazole prophylaxis associated with a significant reduction in serious bacterial infections and mortality. Providing the preventive therapy reduce the co-infection of tuberculosis (TB) which further reduce the duration of the viral load suppression since TB is highly associated in the depletion of CD4+ T-cell count and high viral load.

The finding of this study showed that the time needed for viral load suppression of those who have ≥200 cells/mm^3 CD4 count was shorter than those who have <200 cells/mm^3 CD4 count. This might be due to those who have higher CD4 count during ART treatment have rare HIV related clinical complications which in turn provide the patient an opportunity for early suppression of the viral load. At the same time the patients with low baseline viral load (<10,000 copies/mL) experienced the viral load suppression earlier than those with high baseline viral load (≥10,000 copies/mL) which is supported by the findings from other study.[5]

Therefore, different stakeholders working on HIV program can maintain and potentially improve the time to viral load suppression by improving access to targeted viral load testing and CD4 count, including a routine viral load and CD4 count for all patients on ART starting from the first day of treatment, streamlining and strengthening adherence monitoring and counseling. Furthermore, the healthcare professional and adherent supporter should be consciously and closely follow up patients and intensify targeted adherence support for those patients with poor adherence, low level of initial CD4 count and high baseline viral load.

Readers should be cautious when interpreting this finding, since the data were obtained from patients in one hospital and thus the findings cannot be generalized to all people living with HIV in Ethiopia. In addition, the follow-up time of six months in our study was relatively shorter period compared to other studies that followed their participants for a longer period. Thus, our findings are conservative.

Conflicts of interests

None.

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