_____

**HEALTH RESEARCH IN AFRICA**

**High Quality Research with Impact on Clinical Care**

**Original Article**

# Evaluation of HIV Follow-up Methods in the Mayo-Louti Subdivision in the North of Cameroon

## *Évaluation des Méthodes de Suivi du VIH Dans le Département du Mayo-Louti au Nord du Cameroun*

Abdoul Salam H[1,2], Abessolo Abessolo H[3,4], Simeni Njonnou SR[1], Nzounji Kouosseu F[5], Kemta Lekpa F[1], Ngongang Ouankou C[1], Zoung-Kanyi Bissek AC[6]

[1] Faculty of Medicine and Biomedical Sciences, University of Dschang
[2] Figuil District Hospital, North Cameroon
[3] Faculty of Medicine and Biomedical Sciences; University of Garoua
[4] Faculty of Medicine and Biomedical Sciences, University of Ebolowa
[5] Guider District Hospital, North Cameroon
[6] Faculty of Medicine and Biomedical Sciences, University of Yaounde I

**Corresponding author:**
Abdoul Salam Hamadama
Mail: hamadama2000@yahoo.fr
Tél: (+237) 655462543

**Keywords**: HIV, Viral load, weight, Mayo-Louti

**Mots clés** : VIH, charge virale, poids, Mayo-Louti

**ABSTRACT**

**Background.** HIV infection remains a major public health problem in most countries worldwide. Early initiation of combination antiretroviral therapy (cART) has decreased the risk of HIV transmission by lowering the RNA viral load (VL). However, RNA Viral load is used to detect, follow-up and monitor virological failure. Our main objective was to describe the follow-up of people living with HIV in peri-urban areas of the North Region of Cameroon. **Methods.** A 6 months cross-sectional study was performed from December 2021 to July 2022. We included People Living with HIV (PLHIV) aged 18 years and over, with an HIV viral load (VL) result from less than 6 months, followed up in the HIV care units of the Figuil and Guider Districts hospitals. Statistical analysis was performed using EPI-INFO version 7.2.6.0 software. **Results.** A total of 227 patients were eligible in this study. The population mean age was 34.9 with a female predominance (164, so 72.25%). The 25-30 years age group was the most represented. Despite close monitoring, 89 (39.21%) patients had never been weighed since the ART initiation. HIV VL was available within 36.7 (±17.3) days. These HIV VL results classified 172 participants (75.77%) into HIV-suppressed; 13 participants (5.73%) were undetectable and 42 participants (18.5%) were non-HIV-suppressed. **Conclusion.** PLHIV followed at the Figuil and Guider Districts Hospital in Cameroon were young with female predominance. HIV viral suppression was achieved in 8 out of 10 participants.

**RÉSUMÉ**

**Introduction**. La charge virale du VIH permet de détecter, de suivre et de contrôler un échec virologique. Notre objectif global était de décrire le suivi des PvVIH dans les zones périurbaines de la région Nord du Cameroun. **Méthodes.** Une étude transversale a été réalisée de décembre 2021 à juillet 2022. Nous avons inclus les PVVIH âgées de 18 ans et plus, avec un résultat de charge virale VIH (CV) de moins de 6 mois, suivies dans les UPEC des hôpitaux des Districts de Figuil et Guider. L'analyse statistique a été réalisée à l'aide du logiciel EPI-INFO version 7.2.6.0. **Résultats.** Au total, 227 patients ont été inclus dans cette étude. L'âge moyen des patients était de 34,9+/-9 ans. Les femmes étaient prédominantes (164, soit 72.25%). La tranche la plus touchée est celle de 25-30 (20,70%). concernant le poids, 89 patients (39,21%) patients n'avaient jamais bénéficié de la pesée. Les résultats de CV était disponibles dans un délai moyen de 36,7 +/-17,3 jours. L'évolution de la CV a permis de classifier 172 patients (75,77%) en CV supprimée ; 13 patients (5,73%) en CV indétectable et 42 patients (18,5%) en une CV élevée.. **Conclusion.** La suppression virale du VIH a été obtenue chez environ 8 patients sur 10. Le suivi des paramètres vitaux des patients et le raccourcissement du délai de mis à disposition des résultats de CV devraient être de rigueur.

81

_____

**HIGHLIGHTS**

**What is already known on this topic**
HIV RNA Viral load (VL) is used to detect, follow-up and monitor virological failure

**What question this study addressed**
Follow-up of people living with HIV in two HIV care units of the Mayo-Louti Subdivision in the North of Cameroon using VL.

**What this study adds to our knowledge**
- 39.21% of patients had never been weighed since the ART initiation.
- HIV VL was available within 36.7 (±17.3) days.
- Viral suppression was achieved in 75.77% of patients while 18.5% were non-HIV-suppressed and the VL was undetectable in 5.73% of patients.

**How this is relevant to clinical practice policy or further research.**
- There is a need for more studies to improve the quality of follow-up of PLHIV.

## INTRODUCTION

Human Immunodeficiency Virus (HIV) infection remains a major public health problem in most countries worldwide. According to the WHO, by the end of 2021, people living with HIV were estimated at 38.4 million [33.9 to 43.8 million], of which more than two-thirds (2/3) were from Africa (1). The combination of antiretroviral therapy (cART) has reduced the risk of HIV transmission by dropping viral replication and improving immunity restoration (2). Since the launch of WHO's "Test and Treat" strategy in October 2015 for HIV control (3), ART coverage has been continuous extensively (4) and has improved the quality of life of PLHIV (5). Now, it is possible to follow-up and detect virological failure (1,2) by quantifying plasma RNA viral load (VL), making it possible to predict the complications of the HIV infection and meet a target "95-95-95", regardless of $CD4^+$ T lymphocyte count (6). This follow-up is based on the level of agreement between an individual's behavior in terms of taking medicines, following a therapeutic regimen or changing lifestyle; and medical recommendations (5,7), thanks to effective therapeutic education (ETP), thus contributing to good adherence with treatment (5).

In Cameroon, the prevalence of HIV among adults was estimated at 3.7%. Among this population, less than half (44.7%) achieved VL suppression (8). However, free care of HIV (or PLHIV) in addition to the supply of ART at care units by the state, has made it possible to control the breakdown in stocks of ART (9,10).

However, adherence to antiretroviral therapy remains problematic in the African context (7). This poor adherence to cART has been confirmed all over Africa, in both urban and rural centres (11). In some cases, poor follow-up was associated with poor adherence. Since the introduction of "Test and Treat" strategy no study has been set up to evaluate the management of HIV in peri-urban areas in Cameroon to our knowledge. This study aimed to describe the follow-up of people living with HIV in two HIV Care Units of peri-urban areas of the Mayo-Louti subdivision in the North Region of Cameroon.

## PATIENTS AND METHODS

### Study setting
This study was conducted among adults living with HIV followed up in two district hospitals (Figuil and Guider) in the Mayo-Louti subdivision in the North Region of Cameroon; all followed up at the HIV Care Units (HCU) of both hospitals.

### Participants and sampling

#### *Study design*
We performed a hospital-based cross-sectional study with prospective recruitment over a 6 months-period (from October 2022 to June 2023) at the HIV care Units of Figuil and Guider Districts Hospitals (Mayo Louti subdivision, North Region, Cameroon).

#### *Study Population*
This study targeted PLHIV followed up at the HIV Care Units of the two district hospitals, aged from 18 years old and on HAART, in possession of RNA VL test results less than 6 months.
The sampling was consecutive.

### Procedures
We were introduced to care units by the heads of the hospitals. Clear information was given to all participants about the study's purpose from their psycho-social agents. Patients, who accepted freely and signed the informed consent form, were included. Then, data were collected from their medical records on a survey form, anonymously. The study was conducted according to the Helsinki Declaration.

### Variables
The study was based on standard follow-up tools data. The following variables were collected:
- ***Quantitative variables*** (age, period for VL results available, period of the follow-up, RNA VL count), and
- ***Qualitative variables*** (gender, Weight tracking, Missed appointments, Deaths)

### Operational words
VL suppression was defined as a HIV VL at less than 1000 copies/mL, VL unsuppressed was defined as a HIV VL at more than 1000 copies/mL and undetectable was defined as a HIV VL at less than 50copies/mL (10). Follow up has been considered poor when there was lack of clinical or para clinical data on the patient records on an appointment.

### Data analysis
Data were entered into Microsoft Excel 2016 and analyzed using Epi-info® software version 7.2.6.0. Qualitative variables were expressed as proportions. Quantitative (continuous) variables were expressed as means ± standard deviation.

## RESULTS
During the study, 227 (63 men) participants were included. The participants' mean age was 34.9 (±9) years. The 25 – 30 years age group was the most represented

_____

[47 (20.70%)], with a gradual downward trend with

advancing age.

**Table 1: Characteristics of the study population**

| Variables | | Frequency (n) | Percentage (%) | [CI]$_{95\%}$ |
|---|---|---|---|---|
| **Age (in years)** | 34.9+/-9 years | | | |
| **Category age** | [18-25[ | 28 | 12.33 | [8.36 – 17.33] |
| | [25-30[ | 47 | 20.70 | [15.63 – 26.56] |
| | [30-34[ | 43 | 18.94 | [14.06 – 24.66] |
| | [35-40[ | 39 | 17.18 | [12.51 – 22.73] |
| | [40-45[ | 30 | 13.22 | [9.10 – 18.33] |
| | [45-50[ | 19 | 8.37 | [5.11 – 12.76] |
| | [50-55[ | 14 | 6.17 | [3.41 – 10.13] |
| | [55-60[ | 6 | 2.64 | [0.98 – 5.66] |
| | [60-65[ | 1 | 0.44 | [0.01 – 2.43] |
| **Gender** | **Male** | 63 | 27.75 | [22.03 -34.06] |
| | **Female** | 164 | 72.25 | [65.94 -77.97] |

The follow-up mean duration was 528.3 ± 130.4 days. Despite follow-up, 89 patients out of 227 (39.21%) had never been weighed since the ART initiation. We registered 5 (2.20%) cases of death which were recorded in the community.

HIV VL was available within 36.7 (±17.3) days for the study population.

Concerning the viral load progression, 172 patients (75.77%), had a suppressed their RNA VL compared to 42 (18.5%) patients with high RNA VL count. Thirteen (5.73%) of patients had an undetectable RNA VL.

**Table 2: Distribution of methods used to follow-up the study population**

| Variables | | Frequency (n) | Percentage (%) | [CI]$_{95\%}$ |
|---|---|---|---|---|
| **Mean follow-up period (in days)** | 528.3 days+/- 130.4 | | | |
| **Mean availability period for VL results (in days)** | 36.7 days+/-17.3 | | | |
| **Weight tracking** | Yes | 138 | 60.79 | [54.11-67.19] |
| | No | 89 | 39.21 | [32.81 -45.89] |
| **VL result** | HIV Undetectable | 13 | 5.73 | [3.08- 9.59] |
| | HIV suppressed | 172 | 75.77 | [69.66-81.20] |
| | HIV non-suppresed | 42 | 18.50 | [13.67-24.18] |
| **Missed appointment** | Yes | 5 | 2.20 | [0.72 – 5.07] |
| | No | 222 | 97.80 | [94.93 – 99.28] |
| | | | | |
| **Deaths** | Yes | 5 | 2.20 | [0.72 – 5.07] |
| | No | 222 | 97.80 | [94.93 – 99.28] |

*VL: viral load HIV: Human immunodeficiency Virus*

## DISCUSSION

This study aimed to describe the follow-up of PLHIV registered into two HIV Care Units based respectively at the Figuil District Hospital and Guider District Hospital, in the North Region of Cameroon. This study showed a lack of rigor in follow-up, poor follow-up, good VL control (with only 5.73% of our study population undetectable).

During the study, 227 patients were included in the study, with a tendency towards feminization (72.25%) of the infection. Esther Voundi Voundi et al, in Cameroon (12) and Ngona Mandro C et al, in the DRC (13) had found this trend towards feminisation of HIV infection. Some authors have shown that the vulnerability of the female gender can be explained by the anatomy of their genital tract, the low economic power of women, early sexuality, the high frequency of ulcerative or non-ulcerative sexually transmitted infections likely to facilitate HIV transmission (5,7,14).

The mean age of the patients was 34.9±9 years old. Concerning the categories of age, the majority 47

(20.70%) group of young was between 25 and 30 years old, with a gradual downward trend with advancing age. These results are similar to those of Ngona Mandro C et al (13), that HIV infection predominantly affects the young population. This can be explained by the frequency of sexual activity associated with this age group (7).

The mean period of follow-up was 528.3 ± 130.4 days. This period is sufficient to make the viral load undetectable (1, 15).

Concerning the weighing of patients at the follow-up appointments, 89 patients out of 227 (39.21%) had never been weighed since their beginning of ART. However, weight monitoring at all appointments, particularly in PLHIV, can help to identify a cachectic syndrome (16, 17).

The mean period of the availability of the RNA VL results was 36.7 ±17.3 days. RNA VL is performed every 6 months after the beginning of ART in Cameroon (10). Some authors have shown that the long delay between the monitoring of two RNA VLs has an impact on the early detection of ART failures (7*).

_____

Concerning the VL progression, 172 (75.77%) patients had suppressed their RNA VL compared to 42 (18.5%) of patients with high RNA VL. Only 13 (5.73%) of patients had an undetectable viral load. However, one of the goals of ART was to lower viral load and restore immunity (18). Raoul K et al, Ouagadougou (19), found that the RNA VL count decreases within 6 months from the beginning of the ART. But some authors (7) have reported that forgetfulness and jet lag have a negative effect on therapeutic success.

### Limitations and strengths of the study

#### *Limitations*

This study is not exhaustive for all HIV care units in northern Cameroon. Further studies will be necessary. Also, challenges of keeping patient records.

#### *Strength*

This was a pilot study to assess the effectiveness of clinical and therapeutic monitoring of PLHIV in a peri-urban area, in the period of HIV free care.

### CONCLUSION

This study shows that HIV viral suppression was achieved in 8 out of 10 participants. More efforts should be done to monitor people living with HIV. Weight monitoring and shortening the period for the availability of the RNA VL results could help for early decision on treatment.

### Acknowledgments

We are grateful to all participants in this study. We also thank the heads of the District hospitals that permitted us to carry out this research and the Ministry of Higher Education of Cameroon for the special allocation, granted by the Head of State, for research modernization.

### Competing interests

The authors declare no competing interests.

### Authors' contributions

Concept and study design: ASH
Data collection: ASH, AAH;
Data analysis: ASH, AAH;
Writing of the manuscript: ASH, AAH, SRSN
Manuscript revision for intellectual content: NKF, FKL, CNO, ACZKB.
All authors read and approved the final version of the manuscript

### REFERENCES

1. https://www.who.int/fr/news-room/fact-sheets/detail/hiv-aids
2. Isabel CM, Corine C, Marie-France R, Raphael D, Céline BC, Edith M et al. Réponses innovantes pour faire face aux enjeux liés au VIH dans un hôpital universitaire en Suisse. Rev Med Suisse 2023 ; 19 : 732-5.
3. https://www.emro.who.int/fr/asd/asd-infocus/wad-2015.html
4. Serge CB, Joseph F, Calixte IP, Ernest AM, Raoul F, Arlette M et al. Profil national des indicateurs d'alerte précoce de la pharmaco-résistance du VIH au Cameroun. Pan African Medical Journal. 2020; 37(374)
5. KAMATE E, DIAKITE A, CISSE M, CISSE T, BA BS, OUOLOGUEM DS et al. Impact de l'Education Thérapeutique des Patients sur l'observance des sujets séropositifs, sous traitement antirétroviral au Centre Hospitalier Universitaire du Point G à Bamako. Pan African Medical Journal. 2014; 19:388.
6. J Lamoril, M Bogard. Quantification applied to molecular biology: application to the determination of the HIV-1 RNA viral burden. immunoanal Biol Spéc (1996): 11, 325-332.
7. Y Doumbia, AA Oumar, AI Maiga, O Guindo, M Sanogo, M Ba et al. Impact du décalage horaire dans la prise des antirétroviraux sur la charge virale chez les PVVIH suivis à Bamako/ Impact of jet lag in taking of antiretroviral on the viral load among PLHIV followed up in Bamako. Rev Mali Infect Microbiol, 2014.
8. CAMPHIA-Summary-Sheet-FR_ARV-Adjusted_Mar2020
9. https://dpml.cm/images/Actualite/2019/04-04-2019_D0498_ModaliteDepistagePrisEnChargeVIH.pdf
10. https://www.differentiatedservicedelivery.org/wp-content/uploads/Directives_version-finale-05-aout-2021_Cameroon.pdf
11. Natasha C, Monisha A, Lyndsay D. H, M. Patient-reported barriers and facilitators to antiretroviral adherence in sub-Saharan Africa. AIDS 2017, 31:995–1007
12. Esther V V, Ginette CMK, Joel DTK, Jean PKO, Marie JE, Francois-Xavier M-K. Association entre dépression et charge virale chez les personnes sous traitement antirétroviral suivies à l'Hôpital Central de Yaoundé au Cameroun. Pan African Medical Journal. 2022;41(320).
13. Ngona Mandro C, K. Fayda D, K. Mosomo T, Tsongo Kibendelwa Z, Okotitsho Wembonyama S, Makoso Nimi B. Connaissances, Attitudes et Pratiques sur le VIH/SIDA des Personnes Vivant avec le VIH : une Étude Transversale Descriptive au Nord-Kivu et Itur. Health Sci. Dis: Vol 24 (05) May 2023. pp 76-81
14. David Gisselquist, James Todd, Heiner Grosskurth and Richard Hayes. New Information on the Risks of HIV Transmission in Mwanza, Tanzania [with Reply]. The Journal of Infectious Diseases: Vol. 194, No. 4 (Aug. 15, 2006), pp. 536-538 (3 pages)
15. Carr A, Richardson R, Liu Z. Success and failure of initial antiretroviral therapy in adults: an updated systematic review. AIDS. 2019 Mar 1;33(3):443-453.
16. https://www.cairn.info/revue-sciences-sociales-et-sante-2015-2-page-41.htm
17. Tshingani K, Henri M, Ghislain LMM, Philippe D, Michèle W–D. Profil comparatif et évolutif des personnes infectées par le virus de l'immunodéficience humaine traitées aux antirétroviraux à Kinshasa, République Démocratique du Congo. Pan Afr Med J. 2014; 19: 388.
18. https://www.who.int/fr/news-room/fact-sheets/detail/hiv-aids. December 31st 2023
19. Raoul K, Elie K, Laetitia C, Georges D, Jean S, Lassana S. Evolution des paramètres biochimiques et hématologiques chez les personnes vivant avec le VIH/SIDA sous traitement antirétroviral au Centre Médical du Camp General Aboubacar Sangoule Lamizana. Pan African Medical Journal. 2018; 29:159