

Introduction of point-of-care HIV viral load measurement in Macenta, Forest Region, Guinea-Conakry, West Africa “GO VIRAL”



Image 1: typical village in the Forest Region



Image 2 Location of the study site in Macenta

Context

The HIV cohort in Macenta (approx. 800km from Conakry, 1.5 days travel) is treated at the Centre Médical (CM) of the Mission Philafricaine (MPA, a faith-based non-government organization). The CM-MPA is a reference centre for leprosy, tuberculosis and HIV for the central and eastern region of the country (image 2). Antiretroviral treatment (ART) was introduced in 2008. The cohort has currently included > 2200 patients, of which 50% are still actively in follow-up, while 12% have died, 8% were transferred out and 29% are lost to follow-up. Children account for 3% of this cohort.

The HIV virus cannot be eliminated from the body. However, if ART is taken daily and with a high degree of regularity, multiplication of the virus can be blocked and no virus is measured in peripheral blood (termed “suppressed viremia”). This is the aim of successful antiretroviral therapy. If ART is taken lifelong the general prognosis of patients is good and approaches that of the general population in Western countries.

On a population level the World Health Organisation has set ambitious goals under the slogan “90-90-90”, whereby 90% of all HIV-positive persons in a country should know their HIV status. Of these, 90% should be under ART and of these, another 90% should have a suppressed viremia - so 73% of total estimated HIV-positive persons ideally have a known suppressed viremia. The corresponding figures for Guinea are not completely known. The total population of the country is estimated at 10.5 million; the country has a low HIV prevalence of 1.7% (est. 178’500 HIV-pos. patients). According to an annual report of 2015 approximately 100’000 persons were estimated to have advanced HIV infection and to be in need of antiretroviral treatment. Of these, only 35.6% were under ART, 26% of these had a viral load (VL) test, among whom 74% showed viral suppression. This corresponds to **approximately 4% of total estimated HIV-positive persons in Guinea which have known viral suppression.**



In some patients ART loses its effect and the virus becomes resistant, resulting in non-suppressed (=measurable) viremia – this mainly occurs if ART was not taken regularly for some time, be it because of patient factors (to name a few: suboptimal adherence; concomitant illness and not being able to swallow the pills on a regular basis; distance to the clinic is too long and patients cannot attend for drug refill regularly) or system factors (stock-out of certain drugs at the clinic).

Patients with resistant virus need a switch of ART to a second line treatment combination in order to be able to re-control virus multiplication. **A small percentage (3%) of patients at the CM-MPA is now already on second line treatment after having shown signs of treatment failure**, either through new AIDS-defining diseases (clinical failure) or through an unexpected decline of CD4 T-cells (immunological failure). This is an underestimation, as unfortunately many patients die prematurely and before having been switched to second line treatment, because the signs of clinical or immunological failure are not sensitive. These laboratory and clinical findings suggesting treatment failure always come several months after the drugs have lost control over the virus. **The best measurement to judge ongoing effectiveness of ART without delay is viral load measurement – until now this was not possible at CM-MPA for lack of laboratory capacity and medical training to interpret the results and act on them.**

HIV resistance data for Guinea are not known. However, as in other African contexts after several years of ART roll-out, the prevalence of drug-resistant virus is assumed to be increasing. The years of the Ebola epidemic in 2014 and 2015 were particularly harmful for the country. Ebola itself put an enormous strain on the health care system by decimating the numbers of health care workers and absorbing all other resources for treatment and prevention of Ebola virus disease. But the collateral damage to other health care programs through lack of personnel and fear of patients to access the health care system was probably equally devastating. HIV tests decreased country-wide from 173'000 in 2013 to 42'900 in 2015. This “Ebola-dip” was also felt at the HIV cohort of the CM-MPA¹ (11% fewer consultations of known HIV-positive patients and 47% fewer new diagnoses) even though the CM-MPA never stopped offering its services throughout the whole epidemic. After this period of increased ART interruption, resistance is likely to increase more steeply.

Following from this:

On an individual level, the primary aim of this project is to introduce HIV viral load testing at the CM-MPA to improve individual patient care.

On a longer perspective improved control of viral load among treated HIV-positive patients will decrease onward transmission of resistant virus. This wider impact can be seen for example in the Swiss HIV cohort study, where successful implementation of viral load based monitoring and timely action (switch of ART) upon noticing viral failure is practiced: over time the rate of acquired resistance mutations has markedly decreased.

On a population level, improved individual viral control will reduce onward transmission of resistant virus and will reduce population based prevalence of resistant HIV virus.

¹ Leuenberger D., Hébélamou J., Strahm S. et al. Impact of the Ebola epidemic on general and HIV care in Macenta, Forest Guinea, 2014. AIDS 2015,29:1883-1887.



Concrete steps of the project

Objective 1 – training

1.1. two CM-MPA physicians are sent to ID-Dakar to receive training in viral load based monitoring of ART for 2 months

At Fann University Hospital in Dakar the Infectious Disease department has ample experience with viral load based monitoring of HIV infection and with interpreting VL measurements basing clinical decisions on these results.

1.2. train two junior Guinean MDs in HIV and tuberculosis medicine at the CM-MPA for 12 months each

1.3. training of medical support staff in Conakry within training services of the national AIDS control programme

- three laboratory technicians are sent for training in the use of HIV VL cartridges on the GeneXpert platform
- three HIV counsellors are sent for adherence training and support of patients on second line ART

Objective 2 – establishment of a sustainable system for VLBM at the CM-MPA

In the first phase we will implement viral load monitoring mainly for the most vulnerable populations:

2.1. early infant diagnosis

Infants born to HIV-positive mothers and infected in utero or at birth should know soon about their HIV status, so that they can be treated with antiretroviral treatment before developing complications. Likewise, infants known to be uninfected (negative viral load) can be safely discontinued from prophylactic treatment once they are no longer breastfed.

2.2. targeted testing for suspected viral failure

The aim is to detect viral failure in a timely manner and before the patients develop new opportunistic infections.

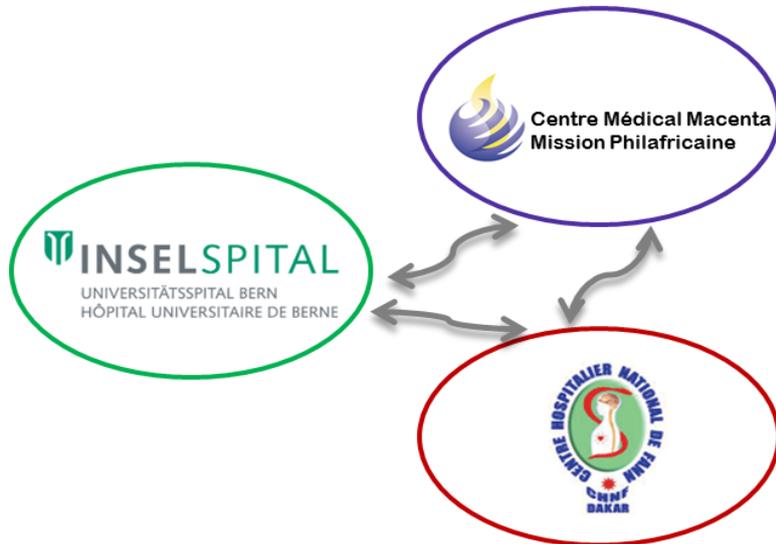
In a later phase, and once the above targets have been met, the aim is to establish routine viral load based monitoring at the CM-MPA as the third step:

2.3. fractioned introduction of routine viral load based monitoring, initially only on certain days of the week

To achieve these goals we have secured additional funding to procure an additional GeneXpert machine so as not to jeopardize tuberculosis diagnostics, which runs over the same platform.

Partnership

This project is a partnership project between



- Guinea-Conakry: The CM-MPA in Macenta, Guinée Forestière
- Senegal: The department of Infectious Diseases at Fann University Hospital, Dakar. This university has extensive experience since 1998 in the management of HIV and opportunistic diseases, and monitors ART success through routine VL based monitoring.
- Switzerland: The department of Infectious Diseases at Bern University Hospital, www.infektiologie.insel.ch

Timeframe

February 2018 to July 2019

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