The Cascade of Care of HIV Seroconverters in the Context of Universal Test and Treat

Joseph Larmarange, Mamadou Hassimou Diallo, Collins Iwuji, Joanna Orne-Glemmien, Nuala McGrath, Mélanie Plazy, Frank Tanser, Rodolphe Thiebaut, Deenan Pillay, François Dabis for the ANRS 12249 TaSP Study Group

Background

The ANRS 12249 Treatment as Prevention (TaSP) cluster-randomized trial aimed at evaluating the impact of a Universal Test and Treat (UTT) approach on prevention of new HIV infections in high prevalence areas in Africa. Trial results (Dabis et al., AIDS conference Durban 2016, FRACO105SB) showed low rates of early linkage to HIV care and treatment and no significant reduction in incidence.

To optimize the impact of UTT, time to antiretroviral treatment (ART) initiation and viral suppression must be significantly shortened, in particular among newly infected individuals. We describe here the longitudinal cascade of care for those seroconverting during the course of the TaSP trial.

Methods

TaSP trial procedures

In this rural area with about 30% HIV prevalence, every six months between March 2012 and June 2016, resident members aged ≥16 years old were offered rapid HIV testing at home (for diagnosis) and asked independently to provide dried blood spot (DBS) samples (for incidence estimate). Those testing positive or who self-reported their positive status were referred to local trial clinics for ART initiation, regardless of their CD4 count (intervention arm) or according to national guidelines (control arm). They had the opportunity to seek care in local government clinics where treatment was offered according to national guidelines.

Computation of residency, HIV and care statuses

Residency status of each participant was computed for each calendar year taking into account population exits (death, out-migration) and new eligible individuals (in-migration, 16th anniversary).

Cases of HIV seroconversion were identified using multiple sources: repeat DBS, repeat rapid tests, HIV self-reports and clinic visits. Date of seroconversion was estimated using a random imputation approach between last negative and first positive known HIV status. For those who were resident in the trial area at the estimated date of seroconversion, the HIV care status was computed, for each day following seroconversion (MO), using additional data (clinical visits, ART prescription, CD4 counts, viral loads) collected both in trial clinics and in local government clinics, linked at individual level with the authorization of the ethics committee.

Longitudinal cascade of care since HIV seroconversion

The analysis was restricted to those observed at least one year after HIV seroconversion. We plotted their detailed trajectories, i.e. the succession of their daily statuses over the first year following seroconversion, indicating whether the participants entered care in a local trial clinic or in a local government clinic and indicating successful contacts by trial team in subsequent survey rounds.

We stratified the results according to trial arm and according to the main care events occurring during the first 12 months following HIV seroconversion: (i) those not diagnosed during that period; (ii) those diagnosed but who did not enter care in a local trial or government clinic; (iii) those who did enter care but did not start ART; and (iv) those who initiated ART.

Results

We observed 486 individuals acquiring HIV in the course of the trial. However, the population-based incidence rate at an estimated seroconversion date where the participants were not resident in the trial area. Therefore, only 554 seroconverters (524 in intervention arm; 321 in control arm) were retained for the computation of the longitudinal cascade.

Longitudinal cascade of HIV care since HIV seroconversion

At M12, one year after seroconversion, 27% were non resident in the trial area; 20% were resident but did not diagnose; 30% were not diagnosed but were already in care in the trial area, 14% actively in care or a local government clinic; 4% of ART but not virally suppressed and 10% on ART and virally suppressed (Fig. 1).

Care trajectories over the first year after HIV seroconversion

For those diagnosed by a trial fieldworker, 23% (45/196) entered care in a trial clinic and 11% (21/196) in a government clinic. Those diagnosed in a local government clinic were, by definition, considered as having enter care the same day.

Overall, only a third of all seroconverters (34%, 130/386), i.e. half of those diagnosed, were diagnosed by a trial field worker; 21% (55/260) in a local government clinic (place of diagnosis being unknown for the remaining 9 participants).

Entry into care (first clinic visit)

For those diagnosed by a trial fieldworker, 23% (45/196) entered care in a trial clinic and 11% (21/196) in a government clinic. Those diagnosed in a local government clinic were, by definition, considered as having enter care the same day.

Overall, only a third of all seroconverters (34%, 130/386), i.e. half of those diagnosed, were diagnosed by a trial field worker; 21% (55/260) in a local government clinic (place of diagnosis being unknown for the remaining 9 participants).

CD4 count at first clinic visit and ART initiation

In trial clinics, baseline CD4 was documented for 48 of 52 and median count was 518 [IQR: 373-657]. 67% (55/82) initiated ART (64%, 21/32 in intervention arm, 52%, 14/27 in control arm, p = 0.0187). CD4 count at first clinic visit was documented for 67 of the 78 who entered care in a government clinic and the median count was 585 [IQR: 340-730]. Only 40% (31/78) initiated ART.

Overall, those who entered care (51%, 66/130) initiated ART within 12 months after HIV seroconversion, i.e. 17% (66/386) of all seroconverters.

Discussion / Conclusion

Data collected through the ANRS 12249 TaSP trial constitute a unique opportunity to make a fine description of individual trajectories over time through HIV services.

During the first year following HIV seroconversion, one third of individuals remained undiagnosed, one third discovered his/her HIV positive status but did not enter care and one third linked to an HIV clinic. Among those linked to a trial clinic implementing treatment regardless of CD4 count, the proportion of seroconverters initiating ART was high.

Overall, the observed cascade of care was clearly suboptimal in seroconverters despite the introduction of UTT services and a trial intervention. With only 17% initiating ART within 12 months after seroconversion, we are far from the 81% (90% × 90%) expected by the model of Granich et al. (2009) to eliminate HIV transmission.

This poor outcome was aggravated in this rural setting by out-migration considered here as loss to the cascade. The dynamic between migration, the HIV epidemic and care trajectories through health system requires additional investigations. First, mobility is associated with a higher risk of HIV acquisition, although we don’t know with exactitude what proportions of seroconverters occurs the location of seroconversion after seroconversion: 78 in government clinics and 52 in trial clinics (first clinic visit).

Acknowledgements

Funding: ANRS 12249 (TaSP), ICS (Clinical Trials registration NCT00332878); MERCK & Co. Inc. and Gilead Sciences that provided Atripla®-drug supply. ARR further receives core funding from the Wellcome Trust, which provides the basis for the population-and clinic-based research.

TaSP ANRS 12249 Study Group (by alphabetical order)