EARLY ANTIRETROVIRAL THERAPY AND PRE-EXPOSURE PROPHYLAXIS FOR HIV PREVENTION AMONG FEMALE SEX WORKERS IN COTONOU, BENIN: EARLY FOLLOW-UP AND ADHERENCE DATA

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Background:

- Most of the clinical studies that have demonstrated the safety and efficacy of treatment as prevention (TasP) and pre-exposure prophylaxis (PrEP) as strategies for HIV prevention, have also stressed that the success relies primarily on treatment adherence.
- Yet, little is known about adherence and other factors associated with the implementation of these two strategies in the real world in low- and middle-income countries.
- Also, most of the few available data are relative to men who have sex with men (MSM) and transgendered women. We report here on the first eight months of a demonstration project that we are currently carrying out on these two HIV prevention strategies among female sex workers (FSWs) in Cotonou, Benin.

Objectives:

- To assess the feasibility and usefulness of integrating (TasP) and (PrEP) with Truvada® to the combination prevention package offered to FSWs in Cotonou, Benin.
- More specifically, to assess the uptake of and adherence to TasP and PrEP among this high risk population.

Settings, Methods and Materials:

- This open label study is being carried out in the "Dispensaire des Infections Sexuellement Transmissibles" (DIST), an STI clinic dedicated to FSWs, within a community health center of Cotonou, the economic capital city of Benin.
- Four community workers are trained to mobilize potential participants throughout the catchment area of the clinic and also to regularly remind study participants of their visits.
- The study is planned to recruit and follow-up 100 HIV-infected FSWs for TasP and 250 HIV-negative FSWs for PrEP (one-year recruitment period, followed by an additional one year of follow-up).
- The actual recruitment visit is preceded by a screening visit two weeks earlier in order to determine the HIV status and assess other eligibility criteria.
- Through follow-up visits at day 14 and then quarterly, we closely monitor treatment adherence, using various tools including self-reporting, pill count and drug blood level (the latter being only performed for PrEP).
- For pill count, we ask participants to bring in their bottles of medication at each visit while drug dosage is performed only at day-14 and month-6, -12 and -24 visits (only day-14 and month-6 reported here).
- Based on plasma tenofovir levels, the lowest level of detection is 0.31 ng/ml. Drug level ≥ 5ng/ml is considered as equivalent to having taken 4 or more pills in the last week (a level of adherence reported as effective among MSM) and ≥ 25 ng/ml as perfect adherence (having taken all the pills in the last week).
- Adherence levels measured by self-report and pill count are compared to that of drug blood level with McNemar chi-square test.
- Written informed consent was obtained from all participants. This study and all its procedures were approved by the ethics committee of the CHU de Québec, Québec, Canada, and by the National Ethics Committee for Health Research in Benin

Results:

- From 18th September 2014 to 30th June 2015, we screened 240 FSWs and out of them, 143 and 55 were recruited in the PrEP and TasP arms, respectively.
- Median age of all participants was 32.5 years (Table 1) and 44% of them were from Benin, whereas the others were from surrounding countries (Table 2).
- As of 30th June, the overall retention rate in the study was 88% for TasP and 81% for PrEP.
- Most drop-outs were due to mobility and leaving the sex trade. The recruitment accrual and the retention rates per follow-up visit are presented in figure 1.
- The different levels of treatment adherence for PrEP, as assessed at day 14, month 3 and month 6 are presented for self-reporting and pill count in tables 3 and 4 respectively.
- The results of adherence measurement by these two means are compared to those from drug blood levels in tables 5 and 6.

Table 1. Age distribution among female sex workers recruited in a TasP/PrEP demonstration study in Cotonou, Benin.

Age groups	PrEP (N=143)	TasP (N=55)	Total (N=198)
	%	%	%
18 – 24 years	20.3	9.1	17.2
25 – 34 years	41.3	36.4	39.9
35 – 44 years	23.1	41.8	28.3
45 – 54 years	14.0	12.7	13.6
55 – 59 years	1.4	0.0	1.0

Table 2. Country of origin among female sex workers recruited in a TasP/PrEP demonstration study in Cotonou, Benin.

Country	PrEP (N=143)	TasP (N=55)	Total (N=198)
	%	%	%
Benin	42.0	49.1	43.9
Nigeria	24.5	18.2	22.7
Togo	26.6	21.8	25.3
Ghana	5.6	9.1	6.6
Others	1.4	1.8	1.5

Figure 1: Flow chart for recruitment and follow-up visits (retention rate per visit rank)

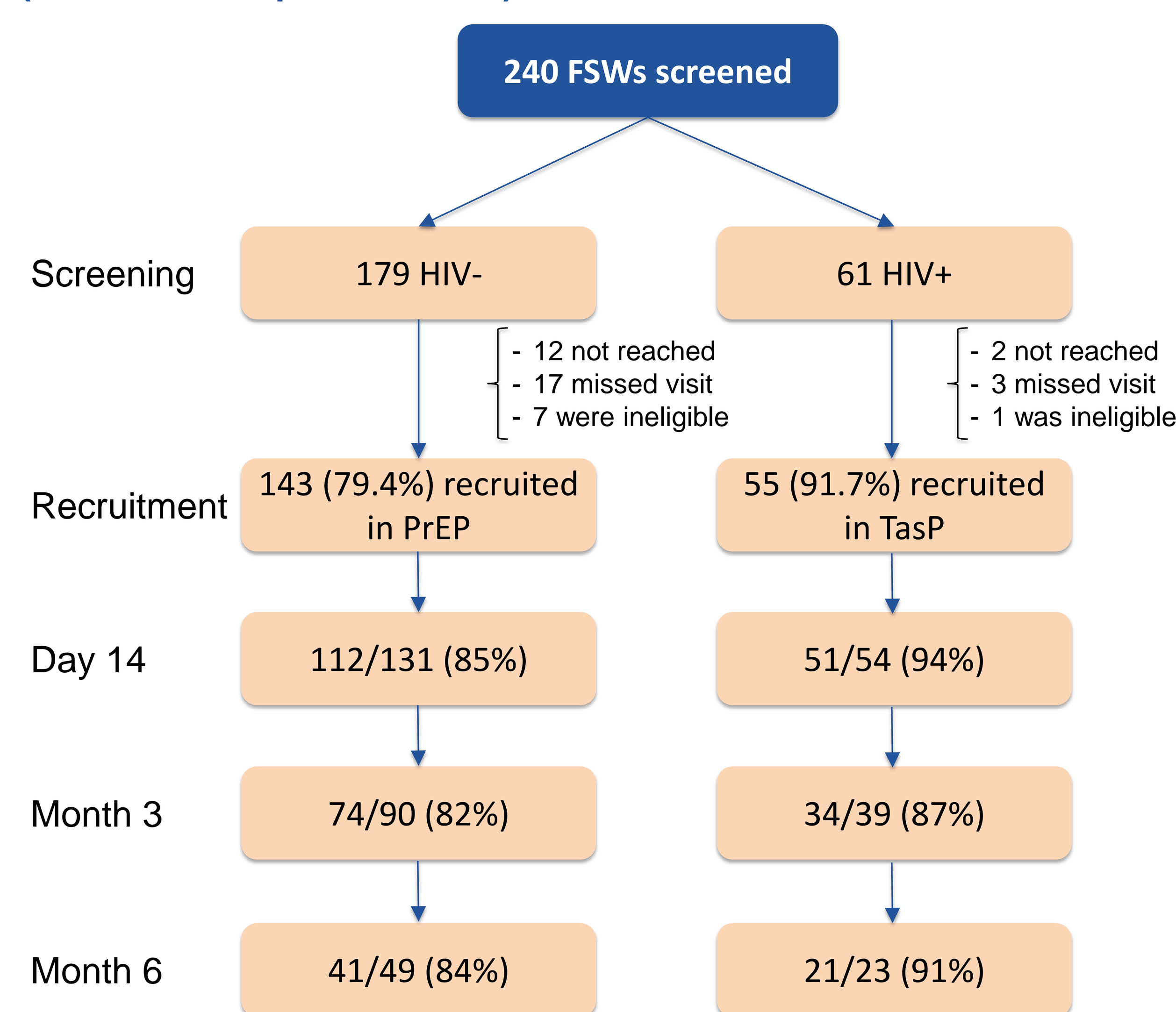

Table 3. Treatment adherence over the last 7 days according to participants self-reporting in the PrEP arm of a demonstration study on TasP and PrEP among female sex workers in Cotonou, Benin

Rank of visit and level of adherence	Proportion (%) of participants with self-reported adherence
Perfect or full adherence	
Day 14	77/112 (68.8)
Month 3	47/74 (63.5)
Month 6	22/42 (52.4)
Adherence at 57% (at least 4 pills taken last week)	
Day 14	94/112 (83.9)
Month 3	53/74 (71.6)
Month 6	30/42 (71.4)

Table 4. Treatment adherence over the last 7 days according to pill count in the PrEP arm of a demonstration study on TasP and PrEP among female sex workers in Cotonou, Benin[1]

Rank of visit and level of adherence	Proportion (%) of participants with adherence based on pill count
Perfect or full adherence	
Day 14	45/90 (50.0)
Month 3	2/18 (11.1)
Month 6	1/27 (3.7)
Adherence at 57% (at least 4 pills taken last week)	
Day 14	83/90 (92.2)
Month 3	6/18 (33.3)
Month 6	16/27 (59.3)

[1] Pill count started later than self-report and some data entry is also pending

Table 5. Comparison of treatment adherence over the last 7 days as measured by self-reporting *versus* drug blood level in the PrEP arm of a demonstration study on TasP and PrEP among female sex workers in Cotonou, Benin[1]

Rank of visit and level of adherence	Self-reported (%)	Drug blood level (%)	p-value for McNemar test
Perfect or full adherence			
Day 14	72/103 (69.9)	59/103 (57.3)	0.049
Month 3	44/74 (59.5)	Not done	
Month 6	18/32 (56.2)	9/32 (28.1)	0.022
Adherence at ≥ 57% (at least 4 pills taken last week)			
Day 14	87/103 (84.5)	63/103 (61.2)	<0.001
Month 3	53/74 (71.6)	Not done	
Month 6	24/32 (75.0)	12/32 (37.5)	0.004

[1] Smaller sample size for this analysis as blood was tested for Truvada® only on samples collected up to April 30, 2015.

Table 6. Comparison of treatment adherence over the last 7 days as measured by pill count *versus* drug blood level in the PrEP arm of a demonstration study on TasP and PrEP among female sex workers in Cotonou, Benin[1]

Rank of visit and level of adherence	Pill count (%)	Drug blood level (%)	p-value for McNemar test
Perfect or full adherence			
Day 14	43/84 (51.2)	55/84 (65.5)	0.067
Month 3	2/18 (11.1)	Not done	
Month 6	0/15 (0.0)	4/15 (26.7)	0.125
Adherence at ≥ 57% (at least 4 pills taken last week)			
Day 14	78/84 (92.9)	57/84 (67.9)	<0.001
Month 3	6/18 (33.3)	Not done	
Month 6	10/15 (66.7)	6/15 (40.0)	0.289

[1] Smaller sample size for this analysis as blood was tested for Truvada® only on samples collected up to April 30, 2015. Pill count data are also incomplete, giving a sample size smaller than in Table 5.

Discussion:

- While the recruitment rate is fairly good for the PrEP arm, it is quite excellent for the TasP arm.
- The retention rates are slightly higher for TasP than for PrEP, though both are acceptable and higher than in previous clinical studies in the same population.
- PrEP adherence is moderately high, with 61- 68% of participants showing (on day 14) a drug level consistent with at least 4 pills taken over the last week. However, this proportion is lower (37- 40%) at month-6.
- These figures seem somewhat higher than in the VOICE and FEM-PrEP trials, the only two PrEP efficacy trials that enrolled women at high-risk in developping countries. In VOICE, ≥50% of the women did not have any tenofovir detected in any of their blood samples[1] collected quarterly, whereas good biological adherence was found in only 12% of FEM-PrEP participants[2]. Both trials did not show any effectiveness for PrEP with Truvada®.
- Adherence based on self-report is clearly unreliable in our study, whereas pill count has results that come much closer to those based on blood detection of the product, with the latter even suggesting better levels of full adherence than pill count at day 14.
- This is somewhat reassuring as drug blood level could not be feasible on a routine basis to monitor adherence, but pill count could. However, the value of pill count needs to be confirmed after full follow-up of the study cohort, including biological measurement of adherence among all participants till the end of the study

Conclusion:

- Overall, these preliminary findings on the uptake and adherence of TasP and particularly PrEP in the real world are quite encouraging and suggest that with a sustained community mobilization and individually tailored adherence education program, the implementation of these two preventive stategies may be feasible among FSWs in Benin.

References:

1. Marrazzo JM, Ramjee G, Richardson BA, et al. Tenofovir-Based Preexposure Prophylaxis for HIV Infection among African Women. N Engl J Med 2015;372:509-18.
2. Corneli A, Deese J, Wang M, et al. FEM-PrEP: adherence patterns and factors associated with adherence to a daily, oral study product for preexposure prophylaxis. J Acquir Immune Defic Syndr 2014;66:324–31

Disclosure of interest statement:

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