Estradiol concentrations in trans women on BIC/FTC/TAF compared to those without HIV

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BACKGROUND

Accessing feminizing hormone therapy (FHT) is essential to many trans women. Concern around drug-drug interactions between FHT and antiretroviral therapy (ART) can be a barrier to acceptance of ART for trans women with HIV. We measured serum estradiol concentrations in trans women with HIV taking FHT and BIC/FTC/TAF versus trans women without HIV taking FHT and no ART.

METHODS

- Single-center, parallel group, clinical study of adult trans women with HIV taking BIC/FTC/TAF and without HIV not taking BIC/FTC/TAF (controls).
- **Inclusion Criteria:**
  - Taking at least 2 mg/day of oral 17-beta estradiol plus an anti-androgen therapy (spironolactone or cyproterone, orchidectomy, or hypogonadism), with no FHT medication changes for at least 3 months prior to entry.
  - Women with HIV were on suppressive ART for at least 6 months, either taking or switched to BIC/FTC/TAF at baseline.
- At the month 2 visit, blood was collected prior to ART and FHT dosing and then at 1, 2, 3, 4, 6, 8, and 24 hours post-dose for estradiol concentration measurements.
- Estradiol concentrations were measured from serum using chemiluminescent microparticle immunoassay (CMIA).
- Area under the concentration-time curve (AUC) over 24 hours was calculated by noncompartmental methods.
- Median estradiol maximum concentration (C_{max}), time to C_{max} (T_{max}), and AUC were compared between groups using Wilcoxon rank-sum tests. $C_{4h,}$ C_{max} and AUC were compared using GMR (90% CI).
- C4h was selected based on the iFACT study indicating that the estradiol C_{max} occurred approx. 4 hours post-administration.

No statistically significant differences in estradiol concentrations were identified between trans women on feminizing hormone therapy who were taking BIC/FTC/TAF versus those not taking ART.

	Trans Women with HIV on BIC/FTC/TAF (n=10)	Trans Women without HIV not on ART (n=15)	GMR [90% CI] ART: Control	P value
Age (years)	36.5 [30, 45.25]	29 [27, 37.5]		0.173
Estradiol dose (mg)	4 [4, 4]	4 [3, 4]		0.232
T_{max} (hours)	1.5 [2, 2.75]	4 [2, 7]		0.130
C_{4h} within target of 200-750 pmol/L (%)	80%	53%		0.229
C_{trough} (pmol/L)	269.5 [179.3, 405.1]	183.7 [142.1, 237.5]	1.47 [0.95, 2.27]	0.178
C_{4h} (pmol/L)	270.2 [194.9, 374.7]	191.7 [149.8, 245.3]	1.41 [0.96, 2.07]	0.160
C_{max} (pmol/L)	369.4 [266.0, 513.0]	243.1 [194.9, 303.2]	1.52 [1.06, 2.18]	0.115
AUC (mg*h/L)	6605.6 [4661.4, 9360.8]	4574.8 [3515.9, 5952.6]	1.44 [0.96, 2.17]	0.235

Table 1: Summary of clinical and estradiol results in trans women on BIC/FTC/TAF vs. no ART

Age, estradiol dose, and T_{max} are summarized using medians [Q1, Q3]. Concentrations are summarized using geometric means (GM) [90% CIs]. GMR, geometric mean ratio. P-value: Wilcoxon statistical test.

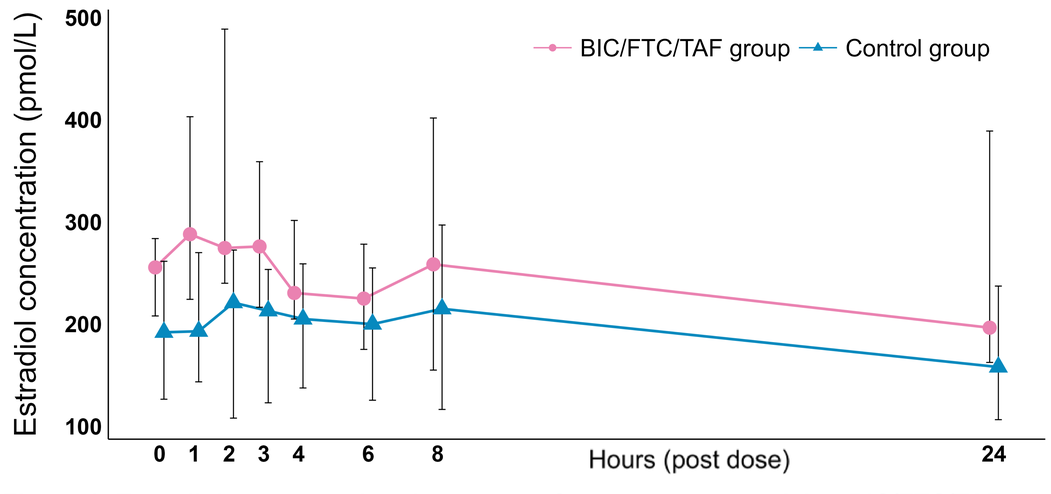

Figure 1: Estradiol concentration time-curve of trans women receiving BIC/FTC/TAF (n=10) compared to trans women without HIV or ART (n=15); medians (IQRs) reported.

RESULTS

- Participants (n=25) were enrolled from November 2022 to June 2024
- The 10 participants on ART had a median age of 36.5 years compared to 29 years for the 15 control participants.
- Median oral estradiol dose was 4 mg (range 2-8 mg) overall and 4mg for the BIC/FTC/TAF group and 4mg for the control.
- Anti-androgen therapy included spironolactone (n=12), cyproterone (n=8), orchidectomy (n=4), and hypogonadism (n=1).
- Estradiol C_{max} and T_{max} for the BIC/FTC/TAF group were 357.5 pmol/L and 1.5 hours, respectively, and 262 pmol/L and 4 hours for controls.
- AUCs were not different between groups: 5827 mg*h/L for the ART group and 4808 mg*h/L for controls.
- Overall, 64% had estradiol C_{4h} within the target of 200-750 pmol/L (normal range for pre-menopausal women) [80% among women on BIC/FTC/TAF and 53% among those not on ART].

CONCLUSIONS

Among trans women on FHT, estradiol concentrations were similar between trans women on BIC/FTC/TAF and controls. This suggests a low probability of clinically relevant drug-drug interactions between FHT and BIC/FTC/TAF.

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