Association of HIV and Sex-Hormones with Persistent Anal HPV16 and Abnormal Cytology

1009

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BACKGROUND

- Persistent anal HPV16 infection is a key risk factor for anal cancer(1).
- We conducted a longitudinal cohort study to assess factors associated with persistent abnormal anal cytology (AAC) and HPV16 in transgender women (TGW) and cisgender men who have sex with men (MSM).

METHODS

- TGW and a control arm of MSM were recruited from two academic-community clinics in Baltimore, MD and Washington, DC.
- Participants had annual visits with behavioral surveys, anal swabs for HPV PCR testing (Roche Cobas®) and anal cytology, and provided serum every 3 months for hormone levels (electrochemiluminescence immunoassay) and HIV testing.
- AAC was defined as atypical squamous cells of undetermined significance, low or high-grade squamous intraepithelial lesions.
- HPV16 persistence was defined as continued HPV16 detection, and clearance as its absence at two consecutive timepoints.
- Fisher's Exact test was used for this interim analysis.

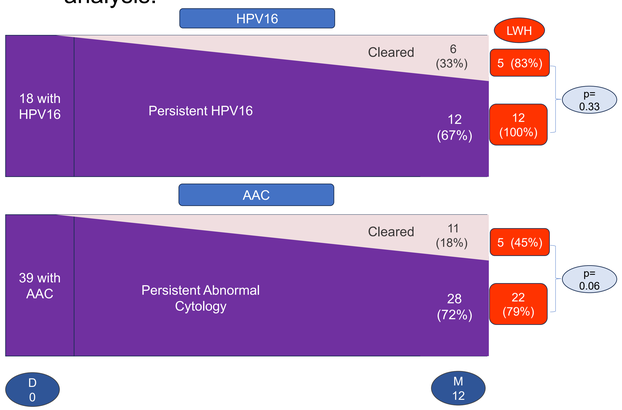


Figure 1: Illustration of persistence vs clearance of anal HPV16 and abnormal anal cytology (AAC) in a cohort of transgender women and cisgender men who have sex with men and distribution by HIV status. *LWH: living with HIV*

References:
(1) Clifford GM, Georges D, Shiels MS, et al. A meta-analysis of anal cancer incidence by risk group: Toward a unified anal cancer risk scale. Int J Cancer. 2021;148(1):38-47. doi:10.1002/ijc.33185
(2) Ryser MD, Bravo IG, Campos NG, et al. IPVS Consensus Statement on the Natural History of Cervical HPV Infection. *J Infect Dis*. Published online November 14, 2025. doi:10.1093/infdis/jiaf574

In TGW, baseline HPV16 and AAC tended to persist at one year. LWH and hormone levels were not associated with AAC or HPV16 persistence.

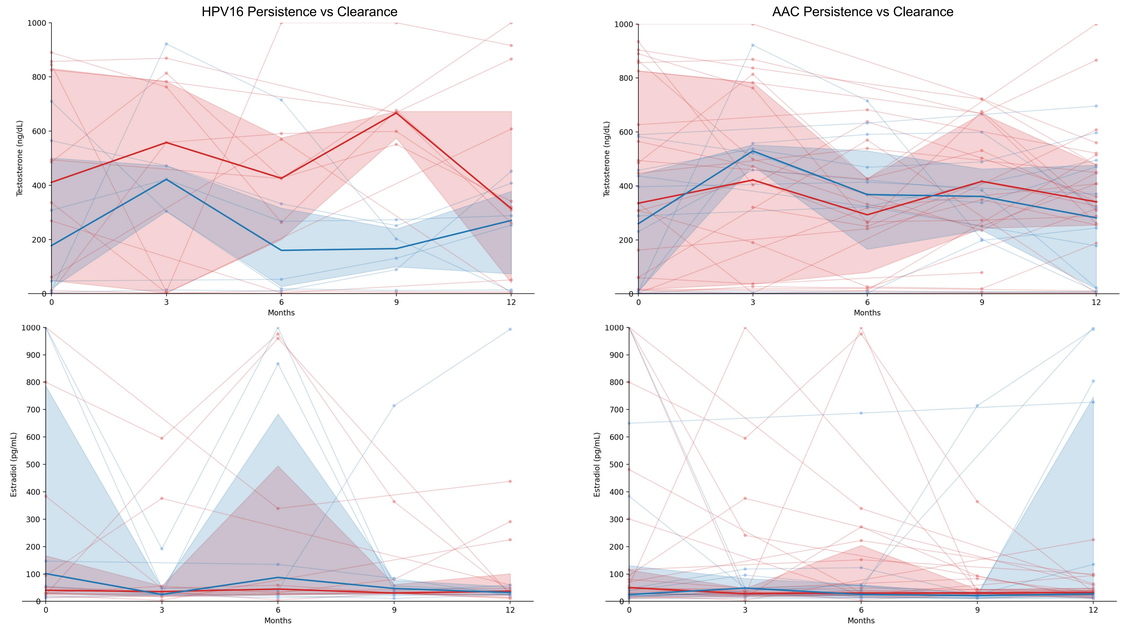


Figure 2: Longitudinal analysis of sex-hormone levels and HPV16 persistence (n=12) vs clearance (n=6) (panels A and C), and abnormal anal cytology persistence (n=26) vs clearance (n=11) (panels B, and D) in transgender women and cisgender men who have sex with men. *Red line and shaded region: Median persistence and IQR. Blue line and shaded region: Median clearance and IQR.*

	Anal HPV16			Abnormal Anal Cytology				
	Cleared (N=6)	Persistent (N=12)	Remained Negative (N=57)	No longer AAC (N=11)	Persistent AAC (N=28)	Remained Normal (N=24)	Progressed to AAC (N=12)	Total (N=75)
Gender (TGW)	6 (100%)	11 (92%)	48 (84%)	7 (64%)	26 (93%)	21 (88%)	11 (92%)	65 (87%)
Median Age (IQR)	44 (37-57)	38 (35-41)	37 (29-54)	38 (29-56)	39 (34-53)	38 (28-50)	35 (27-46)	37 (30-53)
HIV Status (LWH)	5 (83%)	12 (100%)	28 (49%)	5 (45%)	22 (79%)	11 (46%)	7 (58%)	45 (60%)
Tobacco (Yes)	4 (67%)	8 (67%)	29 (51%)	7 (64%)	15 (54%)	11 (46%)	8 (67%)	41 (55%)

Table 1: Characteristics of transgender women (TGW) and cisgender men who have sex with men with valid anal HPV16 and cytology results. *LWH: Living with HIV. AAC: abnormal anal cytology. IQR: interquartile range.*

RESULTS

- HIV status and median average estradiol and testosterone levels did not differ significantly between participants with persistent versus cleared HPV16 (p = 0.35, 0.36, 0.25) or between those with persistent versus cleared AAC (p = 0.35, 0.22, 0.59).
- Although testosterone remained higher at all timepoints in participants with persistent HPV16, longitudinal analysis showed no significant differences compared to those who cleared HPV16

CONCLUSIONS

- LWH was not associated with an increased risk of persistent HPV16 or AAC in this cohort, which consisted predominantly of TGW. Screening for anal cancer should remain a priority for all TGW, regardless of HIV status.
- Sex-hormone levels were not associated with a higher risk of persistent HPV16 or AAC, however a trend towards higher testosterone levels in the persistent group should be explored in larger studies.
- Key limitations include the small sample size and the possibility that HPV16 persistence and clearance were misclassified based on recent International Papillomavirus Society recommendations(2).

ADDITIONAL KEY INFORMATION

This is an interim analysis of an ongoing study.

We would like to thank our research participants; our community-collaborators at Baltimore Safe Haven and HIPS org; and the GEMS and PATCH study teams.

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PLAIN LANGUAGE SUMMARY

Most people in this study who started with anal HPV16, or an abnormal anal Pap still had the same results one year later. Neither living with HIV nor hormone levels were linked to abnormal results, underscoring the need for focused anal cancer prevention for all transgender women regardless of HIV status.