Changes in the Contribution (PAR%) of STIs to HIV Acquisition among Kenyan FSWs from 1993 to 2012

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Introduction

- Genital infections have been associated with increased risk of HIV acquisition
- Understanding how the contribution of different genital infections to HIV incidence has changed over the past two decades may be important for optimizing HIV prevention efforts

Objective

- To assess the population attributable risk percent (PAR%) of different genital tract infections to HIV acquisition in high-risk Kenyan women, from 1993 through 2012

Methods

- HIV-1-seronegative women were enrolled in the Mombasa Cohort
- Monthly testing was performed for HIV, vaginal yeast, bacterial vaginosis (BV), *Trichomonas vaginalis* (TV), *Neisseria gonorrhoeae (GC)*, non-specific cervicitis (NSC), & herpes simplex virus type 2 (HSV-2)
- Cox regression models were used to evaluate the association between the genital tract infections and HIV acquisition over 4 time periods (1993-1997, 1998-2002, 2003-2008, 2008-2012)
- Models were adjusted for age, hormonal contraception, workplace, sexual risk behavior, other STIs, cigarette smoking and calendar year
- The resulting hazard ratios were used to calculate PAR%

Results

- Between 1993 and 2012, 1,964 women contributed 6,135 person-years of follow-up
- There were 325 incident HIV infections (incidence rate 5/100 person-years)

Baseline characteristics (n=1,964)

Characteristic	Median (IQR) or Number (percent)
Age (years)	28 (24-33)
Work place	
Bar/Restaurant	1310 (66.7)
Night club	507 (25.8)
Home based/other	147 (7.5)
Hormonal contraception	
OCP	229 (11.7)
DMPA/Norplant	467 (23.8)

Incidence per 100 person-years of HIV and other genital tract conditions by time period

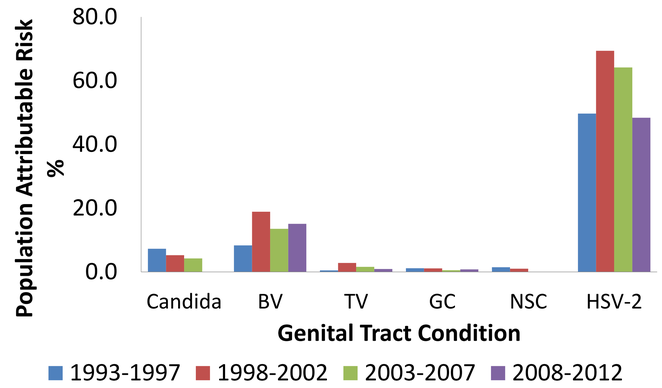
Genital tract condition	Overall	1993-1997	1998-2002	2003-2007	2008-2012
HIV	**5.3**	11.8	6.2	3.3	1.3
Candida	**62.6**	72.1	48.9	68.3	56.6
BV	**169.0**	243.3	147.4	186.1	119.2
TV	**18.6**	36.2	21.0	15.8	6.6
GC	**8.7**	21.7	8.6	3.3	5.4
NSC	**26.9**	105.2	10.6	10.1	5.6
HSV-2	**18.6**	30.5	22.5	11.4	12.0

Association between Different Genital Tract Conditions and HIV-1 Acquisition – HR(95%CI)*

Infection	Overall	1993-1997	1998-2002	2003-2007	2008-2012
Candida	2.1 (1.6-2.7)	3.0 (2.1-4.3)	1.7 (1.0-3.0)	1.5 (0.7-3.1)	1.0 (0.2-4.6)
BV	1.5 (1.2-1.7)	1.3 (0.9-1.8)	2.0 (1.2-3.3)	1.7 (0.9-3.2)	2.6 (0.9-7.4)
TV	1.5 (1.0-2.1)	1.1 (0.7-2.0)	2.1 (1.1-4.1)	2.3 (0.7-7.7)	3.6 (0.4 -31.2)
GC	2.0 (1.4-3.0)	1.5 (0.9-2.7)	2.0 (0.9-4.8)	7.4 (1.7-32.4)	3.7 (0.4-31.2)
NSC	1.2 (0.8-1.6)	1.1 (0.7-1.6)	1.6 (0.7-3.6)	-	-
HSV-2	2.6 (1.6-4.4)	2.4 (1.1-5.2)	5.0 (1.2-21.5)	3.6 (0.8-15.4)	2.2 (0.7-50.5)

* Adjusted for age, hormonal contraception, workplace, sexual risk behavior, and other STIs., cigarette smoking, and calendar year

Contribution (PAR%) of various genital tract conditions to HIV-1 acquisition



- The PAR% of HIV attributable to candida decreased significantly across the four time periods (test for trend p=0.04), while the PAR% of HIV attributable to other genital conditions did not vary significantly
- The PAR% of HIV attributable to genital ulcer disease and warts (not shown) was less than 1% across the four time periods

Conclusions

- There was a general decline in the incidence of HIV and other genital tract conditions over the 20 years
- BV and HSV-2 have remained the largest contributors to HIV acquisition over the 2 decades
- Interventions that prevent these conditions could provide the greatest potential benefit in terms of reducing HIV risk in women

Discussion

- This research highlights priority areas for STI prevention in high HIV incidence areas:
  - Preventing HSV-2 acquisition
    - Early childhood HSV-2 vaccine
    - Microbicides
    - Prophylaxis for HSV-2 infection
  - Preventing BV
    - Periodic presumptive treatment
    - Increasing lactobacilli colonization

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