Trichomonas vaginalis is associated with HIV-1 in high-risk migrant men and women living in inner-city settlements in Johannesburg, South Africa

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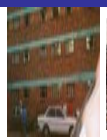
BACKGROUND

- There are limited data on the epidemiology of *Trichomonas vaginalis* (TV) in urban populations in Africa.
- We conducted a survey to determine the prevalence of TV and associations with HIV-1 and other risk factors in migrant men and women living in inner-city Johannesburg.




METHODS


- A community-based survey was conducted from January to November 2004.. Two stage sampling was used to identify eligible men living in four single-sex hostels and women living in six adjacent informal settlements in Region F, Johannesburg, South Africa.
- Consenting participants aged >18 provided data on living conditions, socio-demographics, sexual behaviour, past and current symptoms and health-seeking behaviour.
- TV was detected in first catch urine (FCU) using in-house PCR based on previously published methods (Kaydos-Daniels, 2003). Neisseria gonorrhoeae (NG) and Chlamydia trachomatis (CT) were detected in FCU using Amplicor CT/NG PCR (Roche Diagnostic Systems, Indianapolis, IN, USA). HIV-1 was detected in oral fluid using Vironostika ® HIV Uni-Form II Ag/Ab (bioMerieux, Durham, NC, USA).
- Factors associated with TV were identified using multivariable logistic analysis, adjusting for recruitment site. Results are presented as odds ratios with 95% confidence intervals (CI).
- This study received ethical approval from the University of the Witatersrand Human Research Ethics Committee and the ethics committee of the London School of Hygiene & Tropical Medicine.

RESULTS

Population characteristics

- In total, 2,460 interviews were completed, representing 91.7% of the total sample enumerated.
- Complete laboratory results were available for 2,424 participants in total (98.5%).

Table1 : Socio-demographics, living conditions and sexual behaviour characteristics of men and women

Population characteristics	Men N=1,458 n (%)	Women N=1,002 n (%)
Age in years – mean (SD)	27.9 (7.3)	28.9 (8.1)
Married	204 (14.0)	72 (7.2)
Attended Secondary School	1,141 (78.3)	689 (68.7)
Employed	596 (40.9)	231 (23.1)
ZAR income in previous month – median (IQR)	150 (0-1,200)	0 (0-300)
Originate from rural area	1,011 (69.3)	606 (60.5)
Years in hostels or informal settlements – median (IQR)	4 (2-9)	3 (1-5)
No. of people sharing dwelling – median (IQR)	8 (4-13)	2 (1-3)
Perceptions of community safety		
Very safe	50 (3.4)	56 (5.6)
Safe	279 (19.2)	244 (24.4)
Unsafe	687 (47.3)	463 (46.2)
Very unsafe	437 (30.1)	237 (23.7)
Age at first sex – mean (SD)	17.4 (3.1)	17.2 (2.4)
>1 partner in past 30 days	199 (13.7)	21 (2.1)
Condom use at last sex	300 (20.6)	228 (22.8)
Practise genital cleansing	768 (52.7)	503 (50.2)
Circumcised	211 (14.5)	-

Prevalence of *Trichomonas vaginalis* and other STIs

- TV was detected in 81/1438 (5.6%) men and 188/991 (19.0%) women; 94% of men and 92% of women infected with TV were asymptomatic.
- Infection with CT and NG were 5.2% and 1.9% in men; and 11.1% and 2.0% in women. 11 (0.8%) men and 51/991 (5.1%) women had mixed infections.
- 344 (24.0%) men and 549 (55.5%) women were HIV-1 seropositive.

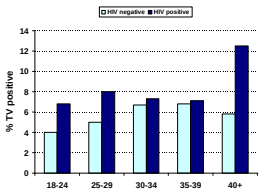


Figure 1a. Prevalence of TV by PCR, according to HIV status, among men in Johannesburg, South Africa

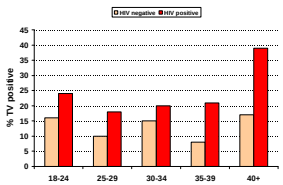


Figure 1b. Prevalence of TV by PCR, according to HIV status, among women in Johannesburg, South Africa

Risk factors for Trichomoniasis

- HIV-1 was associated with TV in both men (adjusted OR=1.77; 95% CI 1.08 to 2.91; p=0.023) and women (adjusted OR=1.53; 95% CI 1.07 to 2.18; p=0.020).
- Other risk factors for TV are indicated in Table 2. These included smoking and an inverse relationship with perception of safety for both men and women, whilst other factors differed by sex.

Table2 : Multivariable model of associations with *Trichomonas vaginalis* in men and women living in Johannesburg (logistic regression adjusting for recruitment site)

Risk factor	TV / Total (%)	Odds ratio	95% CI	p-value
Men	***81/1438 (5.6)***			
Cigarette smoker	50/666 (7.5)	2.27	1.40 to 3.69	0.001
Alcohol drinker	32/686 (4.7)	0.51	0.31 to 0.83	0.006
Experienced or witnessed violence in last month	28/351 (8.0)	1.90	1.16 to 3.12	0.011
Perception of safety				
Very unsafe	22/434 (5.1)			
Unsafe	32/676 (4.7)	1.36*	1.02 to 1.80	0.033*
Safe	20/273 (7.3)			
Very safe	7/50 (14.0)			
Home language/ethnic group				
Isizulu	73/1376 (5.3)	1	-	
Other	8/62 (12.9)	2.42	1.02 to 5.76	0.046
HIV-1 seropositive	27/345 (7.8)	1.77	1.08 to 2.91	0.023
Women	***188/991 (19.0)***			
Cigarette smoker	19/63 (30.2)	1.87	1.02 to 3.43	0.045
History of tuberculosis	25/86 (29.1)	2.13	1.25 to 3.62	0.006
Perception of safety				
Very unsafe	30/237 (12.7)	1.33*	1.07 to 1.64	0.009*
Unsafe	101/455 (22.2)			
Safe	43/243 (17.7)			
Very safe	12/54 (22.2)			
Reports genital discharge in last 6 months	49/317 (15.5)	0.63	0.43 to 0.92	0.018
Chlamydia trachomatis infection	40/110 (36.4)	3.05	1.92 to 4.85	<0.001
HIV-1 seropositive	121/549 (22.0)	1.53	1.07 to 2.18	0.020

CONCLUSIONS

- TV was highly prevalent and was consistently associated with HIV-1 in this high-risk urban migrant population. 92%-94% of TV infections were asymptomatic. Prevention and management of TV in these communities will require screening programmes.
- The extremely high HIV-1 prevalence rates observed call for urgent and innovative interventions in this high-risk inner-city environment.