MSM

High rates of sexually transmitted infections in HIV positive homosexual men: data from two community based cohorts

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Sex Transm Infect 2007;**83**:397–399. doi: 10.1136/sti.2007.025684

Background/objectives: Higher levels of sexual risk behaviours have been reported in HIV positive than in HIV negative homosexual men. In clinic based studies, higher rates of sexually transmitted infections (STIs) have also been reported. We compared rates of common STIs between HIV positive and HIV negative homosexual men from two ongoing community based cohort studies in Sydney, Australia.

Methods: Participants in the two cohorts were recruited using similar community based strategies. They were interviewed face to face annually after enrolment. Comprehensive sexual health screening, including hepatitis A and B, syphilis, gonorrhoea, and chlamydia (in urethra and anus) was offered to participants in both cohorts.

Results: In participants in the HIV positive cohort, 75% were hepatitis A seropositive, 56% had serological evidence of previous or current hepatitis B infection, and 24% had evidence of vaccination against hepatitis B infection. 19% of men tested positive for syphilis and 4% had evidence of recent infections. Compared with men in the HIV negative cohort, after adjustment for age, HIV positive participants had significantly higher prevalence of previous or current hepatitis B infection, syphilis, and anal gonorrhoea.

Conclusion: This finding supports the need for frequent STI testing in HIV positive men to prevent morbidity and to decrease the risk of ongoing HIV transmission.

In recent years, increasing rates of sexually transmitted infections (STIs) and of HIV risk behaviour have been reported in homosexual men in industrialised countries, including Australia.[1–4] Among HIV positive men, levels of sexual risk behaviour have generally been reported to be higher,[5] and in clinic based samples higher rates of STIs have been described.[6 7] The extent to which these clinical data on STIs in HIV positive men apply to HIV positive homosexual men more generally is uncertain.

METHODS

In Sydney, Australia, we have two ongoing community based cohorts of homosexual men—the Health in Men (HIM, HIV negative) and the Positive Health (pH, HIV positive) studies.[5 8] Each study has recruited using similar community based methods, and the only sexual behaviour entry criterion is that the participant reports sex with at least one man during the previous five years. In each study, the men were interviewed face to face annually.

In the HIV negative cohort, comprehensive sexual health screening, including hepatitis A and B (enzyme immunoassay (EIA)), syphilis (EIA; ICE Syphilis, Murex Biotech Ltd, Dartford, UK, positive EIAs were confirmed with the *Treponema pallidum* particle agglutination assay and fluorescent treponemal antibody absorption test), gonorrhoea and chlamydia (in urethra and anus, strand displacement amplification (SDA), BD ProbeTec, BD Diagnostics, Sparks, MD, USA) was offered to all consenting participants.[9–11] Positive anal gonorrhoea results were confirmed by another nucleic acid amplification test (NGpapLC), targeting a different gene (*Neisseria gonorrhoeae* porA pseudogene). Since 2005, identical screening has also been offered to participants in the HIV positive cohort.

We performed data analyses using Stata 8.2 (Stata Corporation, College Station, TX, USA). Since the median age of participants in the HIV positive cohort was older than that of HIV negative men (45 years vs 35 years), measures of prevalence and incidence were adjusted for age using the Mantel-Haenszel test and Cox regression, respectively. We did not control for other demographic factors such as occupation and education as these were not risk factors for the individual STIs.[10 11]

The HIV negative cohort enrolled a total of 1427 men from 2001 to 2004. All STI screening except for gonorrhoea and chlamydia was offered at baseline interview and annual follow-up visits (hepatitis A and B testing was not offered at follow-up visits to those who tested positive at baseline). Gonorrhoea and chlamydia testing commenced in January 2003, and consenting participants were tested annually thereafter. In the HIV negative cohort, the participation rates for serological testing (hepatitis A and B and syphilis) were above 95%, and was 88.6% for gonorrhoea and chlamydia testing.[9–11] For the serological testing, there were no significant differences in age or sexual risk behaviour between those who accepted and those who declined testing at baseline. For the gonorrhoea and chlamydia testing, those who declined testing reported lower numbers of recent sexual partners and were less likely to report recent unprotected anal intercourse.

The recruitment of the HIV positive cohort also commenced in 2001. In 2005 and 2006, 248 and 247 men (a total of 295 individuals), respectively, were offered sexual health screening. Of the total of 295 men, 226 (76.6%) consented to the serology testing and 233 (79.0%) consented to the gonorrhoea and chlamydia screening. For these men, there was no significant difference between those who accepted and those who declined serological testing or the gonorrhoea and chlamydia testing in terms of age, number of sexual partners, and the proportion who reported unprotected anal intercourse with casual partners in the past six months. Comparison of prevalence rates between the two cohorts was based on test results of baseline interviews in the HIV negative cohort, and on results of first tests in the HIV positive cohort.

Abbreviations: EIA, enzyme immunoassay; HIM, Health in Men; pH, Positive Health; SDA, strand displacement amplification; STIs, sexually transmitted infections

RESULTS

Among participants in the HIV positive cohort, 235 had an initial test and 129 were tested twice. At the initial test, 165 HIV positive men (74.7%) tested positive for hepatitis A. The prevalence increased from 60.6% in those aged under 35 years to 78.7% to those aged above 45 years (p trend = 0.05). Serological evidence of previous or current hepatitis B infection (hepatitis B virus core antibody positive) was present in 121 men (56.0%), and this increased from 27.3% in those aged under 35 years to 72.7% in those aged above 45 years (p trend<0.01). Eight men (3.7%) tested positive for hepatitis B virus surface antigen, indicating current infection. Fifty-one men (23.6%) had serological evidence of vaccination against hepatitis B, and this decreased from 42.4% in those aged under 35 years to 12.7% in those aged above 45 years (p trend<0.01).

Forty-two HIV positive men (18.6%) were seropositive for syphilis at the initial test, indicating past or current infection. The seroprevalence increased from 9.1% in those aged under 35 years to 22.4% in those aged above 45 years (p trend = 0.08). Among those positive for syphilis, 10 had evidence of a recent infection: eight reported a syphilis diagnosis in the last 12 months and another two had serological evidence of active syphilis (rapid protein reagin ⩾1:16), suggesting an incidence of 4.4% in the previous year (10/226), based on baseline testing. In participants who tested twice, three seroconverted to syphilis, giving an incidence of 2.5 per 100 person years in the prospective sample. In the HIV negative cohort, 20 men developed incident syphilis from 2001 to 2006 (19 seroconversions and one re-infection), an incidence of 0.5 per 100 person years. After adjustment for age, syphilis incidence in the prospective sample of the HIV positive cohort was non-significantly higher than that of the HIV negative cohort (HR = 3.05, 95% CI 0.80 to 11.59, p = 0.10).

Seven HIV positive men (3.2%) tested positive for anal gonorrhoea at their initial tests, and 5 (2.2%) and 13 (5.9%) were positive for urethral and anal chlamydia, respectively. None tested positive for urethral gonorrhoea.

A comparison of prevalence rates of these STIs with men in the HIV negative cohort is given in table 1. Hepatitis B vaccination was significantly less common in the HIV positive cohort. The prevalence of hepatitis B infection, syphilis, and anal gonorrhoea was significantly higher in the HIV positive cohort. The difference in urethral chlamydia was of borderline significance.

DISCUSSION

These data provide strong support for the results of previous clinic based studies, which have described higher rates of STIs in HIV positive than in HIV negative homosexual men. In our community based samples, more than half of HIV positive men had previous or current hepatitis B infection and less than a quarter had been vaccinated. Around 20% had serological evidence of syphilis, and rates were considerably higher than in HIV negative men. The prevalence of anal gonorrhoea was also higher in the HIV positive men.

Seropositivity to hepatitis B and syphilis may represent infection many years earlier, so it is not surprising that there were significantly increased rates in older men. The same trends were also observed in the HIV negative cohort.[9 11] Nevertheless, even after adjustment for age, the rates remained significantly higher in the HIV positive cohort, probably reflecting high levels of past sexual risk behaviours. Higher rates of gonorrhoea and chlamydia, which usually represent a recent exposure to the infection, in HIV positive men, probably were consistent with the ongoing high levels of sexual risk behaviour observed in this cohort.[5]

Both the HIV positive and HIV negative cohorts were community based, and we believe our STI estimates can be regarded as being reasonably representative of gay community attached homosexual men. However, the participation rates for STI testing were somewhat lower in the HIV positive cohort than in the HIV negative cohort. Those HIV positive men who accepted STI testing were representative of the pH study population in terms of sexual risk. One possible explanation for the lower participation rate in the HIV positive cohort was that these men may be more linked to clinical services, and thus have received recent screening for STIs.

The relatively low rate of hepatitis B vaccination coverage in HIV positive men points to the need for increased targeting of vaccination in this population. The higher rate of STIs in this population argues in favour of frequent STI testing in this population to prevent morbidity and to decrease the risk of ongoing HIV transmission.

Table 1 Comparison of prevalence rates of STIs in cohorts of HIV positive and HIV negative homosexual men

	HIV positive cohort (pH, n = 295)				HIV negative cohort (HIM, n = 1427)				Comparison after age adjustment	
	No tested	No positive	Prevalence (%)	95% CI	No tested	No positive	Prevalence (%)	95% CI	OR (95% CI)	p Value
Hepatitis A	221	165	74.7	68.4 to 80.3	1398	970	69.4	66.9 to 71.8	1.0 (0.7 to 1.5)	0.80
Hepatitis B										
Ever infected*	216	121	56.0	49.1 to 62.7	1397	260	18.6	16.6 to 20.8	3.4 (2.4 to 4.7)	<0.01
Currently infected†	216	8	3.7	1.6 to 7.2	1397	7	0.5	0.2 to 1.0	11.5 (2.2 to 61.2)	<0.01
Vaccinated‡	216	51	23.6	18.1 to 29.8	1397	737	52.8	50.1 to 55.4	0.3 (0.2 to 0.5)	<0.01
Syphilis										
baseline seropositivity	226	42	18.6	13.7 to 24.3	1396	42	3.0	2.2 to 4.0	3.7 (2.3 to 5.8)	<0.01
Gonorrhoea										
Urethral gonorrhoea	226	0	0.0	0.0 to 1.6	1193	4	0.3	0.1 to 0.9	NA	0.61
Anal gonorrhoea	222	7	3.2	1.3 to 6.4	1197	11	0.9	0.5 to 1.6	6.0 (2.0 to 17.4)	<0.01
Chlamydia										
Urethral chlamydia	225	5	2.2	0.7 to 5.1	1192	11	0.9	0.4 to 1.6	2.4 (0.8 to 7.2)	0.10
Anal chlamydia	222	13	5.9	3.1 to 9.8	1186	52	4.4	3.3 to 5.7	1.5 (0.8 to 2.8)	0.25

*Ever infected = hepatitis B virus core antibody positive; †currently infected = hepatitis B virus core antibody positive and hepatitis B virus surface antigen positive; ‡vaccinated = hepatitis B surface antibody positive only;
OR, odds ratio; CI, confidence interval; NA, not applicable.

ACKNOWLEDGEMENTS

The authors thank all the participants, the dedicated HIM and pH study team, and the participating doctors and clinics. Thanks are also given to the laboratory support from the Molecular Laboratory at the SydPath. Contributors: FJ performed the analyses and drafted the manuscript; AEG took overall responsibility for the project and assisted in the analyses and drafting of the manuscript; GPP, IZ, PR, SCK, BD, DJT, PHC, and JMK assisted in formulating the analyses and drafting the manuscript. In addition, BD and DJT assisted with interpretation of the clinical aspect of the infections; PHC assisted with interpretation of the test results.

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Source of support: The National Centre in HIV Epidemiology and Clinical Research and the National Centre in HIV Social Research are funded by the Australian Government Department of Health and Ageing. The Health in Men Cohort study was funded by the National Institutes of Health, a component of the US Department of Health and Human Services (NIH/NIAID/DAIDS: HVDDT Award N01-AI-05395), the National Health and Medical Research Council in Australia (Project grant No 400944), the Australian Government Department of Health and Ageing (Canberra), and the New South Wales Health Department (Sydney). The Positive Health Cohort study was funded by the Australian Government Department of Health and Ageing (Canberra) and the New South Wales Health Department (Sydney). The materials for gonorrhoea and chlamydia testing were provided by Becton Dickinson Pty Ltd.

Conflict of interest: none.

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Accepted 29 May 2007

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