

Sexual behavior & STIs among men at high risk for HIV infection in Mumbai, India

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Background

- 80% of HIV infections in India are attributed to sexual transmission. The sexual behavior of men plays a major role in spreading the epidemic to the general population.
- Men act as a bridge to wives and female partners from high prevalence groups such as female sex workers (FSWs).
- Men may also engage in same sex behavior (MSM), but this has not been explored in adequate detail.

Study question

- What are the risk factors and specific sexual behaviors that place Indian men and their partners at risk for HIV infection?

UCSF/CAPS Mumbai Project

Study Design

- Ongoing randomized clinical trial of an HIV prevention intervention for men at high risk funded by US NIH/NIAID
- HIV negative men enrolled into a one-year trial
- Outcomes: HIV & STI incidence; self-reported risk behaviors

Subjects

- Consecutive sample of men attending 2 public STI clinics

Evaluation

- Extensive questionnaire on demographics and risk behavior
- STI exam and treatment, laboratory diagnostics: VDRL, RPR, TPHA, HSV-2 IgG, HbSAg, Urine PCR for CT & GC, PCR for *T pallidum*, *H ducreyi*, HSV-2
- HIV counseling and testing
- Baseline data on 1929 HIV positive and negative men collected to date
- Recruitment and q 3-month follow-up ongoing

Results

Table 1: Demographic characteristics and HIV (N=1929)

Characteristic	N	(%)	% HIV+
All Participants	1929		14%
Age (in yrs)			
16-25	939	49%	10%*
26-35	627	33%	19%
36+	363	18%	11%
Religion			
Hindu	1286	67%	16%*
Muslim	488	25%	8%
Other	150	8%	13%
Marital Status			
Married	575	30%	12%
Unmarried	1349	70%	14%
Education (years)			
<4	697	36%	15%
4 to 9	842	44%	13%
10+	384	20%	10%
Living Situation			
Flat/Chawl	608	32%	10%*
Slum & Other	1315	68%	15%
Migrant status			
Migrant	1869	97%	9%
Non migrant	54	3%	27%

* p<0.005

Table 2: Sexual risk behavior associated with HIV infection

Risk Factors	Total N	% category	% HIV +
Condom use with FSW	1677		
Always		13%	8%*
Inconsistent		87%	14%
Number of FSW Partners	1678		
1 to 10		54%	11%**
> 11		46%	17%
Oral sex with FSW	1675		
Yes		24%	11%*
No		76%	14%
Oral sex with other Females	781		
Yes		15%	8%*
No		85%	14%
Total # Lifetime Partners	1811		
1 to 10		46%	11%**
11 to 50		36%	14%
>50		18%	19%

* p<0.05, ** p<0.001, + p=0.09

Table 3: Sexually transmitted infections associated with HIV infection

Infection	Total N	Category (%)	HIV positive (%)
Primary Syphilis			
Yes	48	3%	25%*
No	1629	97%	14%
Secondary or Latent Syphilis			
Yes	295	18%	18%*
No	1382	82%	13%
HSV2 infection			
Incident	8	1%	50%**
Recurrent	84	5%	32%
Chronic	597	35%	22%
No HSV	994	59%	8%
Chancroid			
Yes	11	1%	27%
No	1660	99%	14%
Chlamydia urethritis			
Yes	24	1%	21%
No	1647	99%	14%
Gonococcal urethritis			
Yes	122	7%	23%**
No	1543	93%	13%
Non-Gonococcal Urethritis			
Yes	135	8%	11%
No	1547	92%	14%
Condyloma acuminata			
Yes	36	2%	39%**
No	1647	98%	14%
Molluscum Contagiosum			
Yes	21	1%	29%*
No	1662	99%	14%
LGV			
Yes	5	0%	40%
No	1675	100%	14%
Any Sexually Transmitted Infection [#]			
Yes	1018	60%	20%**
No	665	40%	6%

* p<0.05, ** p<0.001

[#] 'Any sexually Transmitted Infection' is defined as the presence or combination of any of following infections: primary syphilis, secondary or latent syphilis, incident, recurrent or chronic HSV2, chancroid, gonorrhea, chlamydia, nongonoccal urethritis, LGV, condyloma acuminata, or molluscum contagiosum

Table 4: Types of sexual partners, lifetime and prior 3 months

Sexual partners lifetime	Total N	n	%
Women			
Female sex worker	1824	1678	92%
Casual or Regular female partner	1827	767	42%
Man	1835	440	24%
Insertive anal sex	440	405	92%
Receptive anal sex	440	53	12%
Hijra	1825	365	20%
Insertive anal sex	365	329	90%
Receptive anal sex	365	11	3%
Multiple sexual partners in prior 3 Mos			
Both FSW & Male/Hijra	1929	193	10%
Both FSW & other female partners	1929	309	16%

* None of these variables were associated with HIV

Figure 1: Married and single men have sex with both FSWs and other men (N=1923)

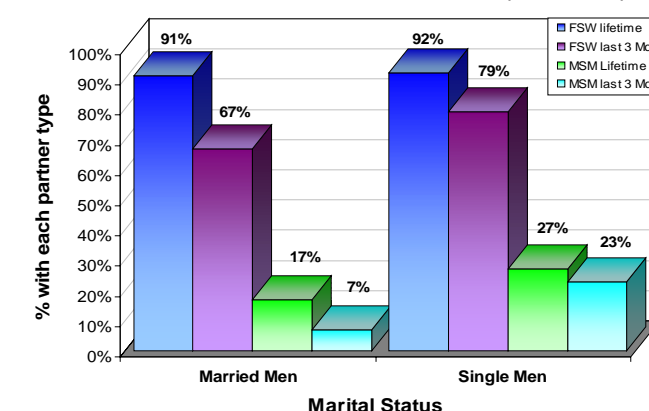


Table 5: Independent predictors of HIV infection

Multivariable logistic regression analysis showed the following to be strongly associated with HIV infection

Predictor	Adjusted Odds Ratio	95% CI
Any sexually transmitted infection	5.1	3.3-7.7
>11 FSW partners	1.7	1.2-2.4
Oral sex with FSW	0.7	0.5-1.0
Age 25-36 years	1.7	1.2-2.4
Being Hindu	2.3	1.5-3.6
Living in slum	1.6	1.1-2.3

Also adjusted for marital status, education, condom use with FSW, sex with male partner & migrant status, which were not associated with HIV

Conclusions

- STIs, HSV-2 infection and sex with FSWs remain the most important risk factors for HIV acquisition among this group of men.
- Many men including those who were married, reported sex with men, *Hijras* (male-to-female transgenders) as well as FSWs.
- This behavior promotes the spread of HIV among different genders and into the general population.
- Greater awareness that sex with other men and *hijras* can be risky is needed.

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