

Risk Behaviors and Sexually Transmitted Diseases in Gay and Heterosexual Men Attending an STD Clinic in Tel Aviv, Israel: A Cross-Sectional Study

Zohar Mor MD MPH MHA^{1,2}, Tamy Shohat MD MPH^{3,4}, Yael Goor BA¹ and Michael Dan MD^{1,4,5}

¹Levinsky Clinic, Tel Aviv District Health Office, Ministry of Health, Israel

²Ramla Sub-District Health Office, Ministry of Health, Israel

³Israel Center for Disease Control, Ministry of Health, Tel Hashomer, Israel

⁴Sackler Faculty of Medicine, Tel Aviv University, Ramat Aviv, Israel

⁵Infectious Diseases Unit, Wolfson Medical Center, Holon, Israel

ABSTRACT: **Background:** The increase in human immunodeficiency virus (HIV) among men who have sex with men (MSM) in Israel during the last decade raises concerns regarding other sexually transmitted diseases (STD) in MSM, which are yet undetermined.

Objectives: To evaluate the STD burden among MSM and heterosexuals visiting the Tel Aviv walk-in STD clinic.

Methods: Records of all male patients who attended the clinic once were reviewed to identify demographic characteristics, behavioral attributes, and test results.

Results: Between 2002 and 2008, 1064 MSM (22%) and 3755 heterosexuals (78%) visited the clinic once. Positivity rates in MSM for HIV, urethral *Neisseria gonorrhoea* and infectious syphilis were higher than in heterosexuals (2.5%, 2.5%, 0.7% vs. 0.6%, 1.3%, 0.3%, respectively), while urethral *Chlamydia trachomatis* was higher in heterosexuals than in MSM (2.7% and 1.4%, respectively). MSM tested in our clinic were younger than heterosexuals ($P < 0.001$), more commonly circumcised ($P = 0.03$) and Israeli-born ($P < 0.001$), used substances during sex ($P = 0.04$), and had prior STD ($P < 0.001$), a greater number of sexual partners ($P < 0.001$), and earlier sexual debut ($P = 0.02$). The final multivariate results for MSM to be diagnosed with HIV/STD were greater number of sexual contacts, previous diagnosis with STD, and infrequent use of condom during anal intercourse.

Conclusions: MSM visiting the Levinsky Clinic had higher rates of HIV/STD than heterosexual males, which correlated with their higher-risk behaviors. The unique characteristics of MSM found in our study, such as sex work, substance use, previous diagnosis of STD, multiple partners and inconsistent use of condom during anal sex should be addressed with innovative interventions to prevent STD/HIV in the gay community in Israel.

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The burden of sexually transmitted infections and human immunodeficiency virus infections among men who have sex with men in developed countries has increased in the last decade [1-3]. Similar to this international trend, the annual number of newly diagnosed HIV/AIDS infections among MSM in Israel has tripled since the beginning of this century [4]. Unlike data pertaining to HIV epidemiology in Israel, the burden of STD among MSM has not yet been determined. The national reported average incidence rates for males in Israel from 2003 through 2007 for *Chlamydia trachomatis* and urethral *Neisseria gonorrhoea*, and the prevalence of HIV in adults older than 20 years of age, are 28, 16, and 75.5 for 100,000 population, respectively (Dr. Dan Gandeco, Dept. of Epidemiology, Ministry of Health, personal communication).

The Levinsky STD walk-in community clinic in Tel Aviv has been operating under the auspices of the Israel Ministry of Health since November 2002 [5] and is the busiest STD clinic in Israel. Its target population includes individuals at risk for acquiring STD, such as sex workers, drug addicts, MSM, persons who have multiple sex partners or other persons considering themselves to be at high risk. The clinic is operated by a multidisciplinary team, including physicians, nurses, social or community workers, and volunteers. These medical and psychosocial services are tailored to meet the unique requirements of the target populations both in the clinic premises and its mobile unit. The counselling, testing and treatment are provided free of charge, and the patients have the option to remain anonymous.

Since it is recommended by the U.S. Centers for Disease Control that MSM be tested for STD and HIV at least once a year [6], this study aimed to assess HIV/STD morbidity among MSM in comparison to heterosexual males who use

HIV = human immunodeficiency virus
MSM = men who have sex with men
STD = sexually transmitted diseases

the clinic's services in Tel Aviv, and to correlate these findings with demographic and behavioral determinants.

SUBJECTS AND METHODS

Records of all male patients who had made a single visit to the clinic during the period November 2002 to April 2008 were reviewed to identify demographic characteristics, behavioral attributes and test results. We focused on single visits to comply with the cross-sectional design of this study and to compare those who were diagnosed with STD with those who tested negative at their visit. A single visit means the first visit and the following appointment, at which the patient was notified of the results and treatment was administered. Patients underwent a standardized interview that included questions on the reason for the visit (symptoms or routine screening), number of sex partners, the gender of their partners (men, women or both), type of partnership (casual or steady) and length of relationship, risk behavior of the partners, previous diagnosis of STD, sexual practices, as well as condom and substance use (illegal drugs and alcohol). Physical examination was performed in all symptomatic patients as well as in patients who asked for a medical examination, which included inspection of the skin of the palms and soles, chest, back and abdomen for rash; inspection of the genitalia; and palpation of inguinal lymph node and scrotum. Testing for *N. gonorrhoea*, *C. trachomatis*, HBsAg, herpes simplex, HIV and syphilis was based on recent sexual behavior. For example, oral swab from pharyngeal *N. gonorrhoea* was recommended only for men who performed oral sex within the last 3 months. Laboratory tests included Gram stain if urethral secretion was observed. Other tests used were urine nucleic acid amplification tests for *N. gonorrhoea* and *C. trachomatis* (Cobas Amplicor PCR, Branchburg, NJ, USA), serology tests of blood samples for HIV (HIV 1/2 GO, Abbott, Wiesbaden, Germany) for those who claimed they were HIV-negative, HBsAg (DiaPro Diagnostics, Milano, Italy), immunoglobulin G for herpes simplex virus type 2 (Gene Bio, San Diego, CA, USA), VDRL (Venereal Disease Research Laboratory) (Becton-Dickenson, Shannon, Ireland), TPHA (*Treponema pallidum* hemagglutination) (Axis Shield, Dundee, UK), and FTA (fluorescent treponemal antibody) (Bio-Mérieux, Carponne, France). Pharyngeal and oral swabs were plated on New York City agar plates (Hy laboratories, Rehovot, Israel) and incubated at $35.5 \pm 0.2^\circ\text{C}$ for 48 hours in a CO₂-rich environment. *N. gonorrhoea* was diagnosed if Gram staining of the urethral exudates identified intracellular Gram-negative diplococci, if isolates of *N. gonorrhoea* were identified on NYC plate culture, or if gonococcal DNA was detected by NAAT. Infectious syphilis was diagnosed if VDRL titer was \geq

1:8 in a patient with a positive TPHA and/or FTA and no prior diagnosis for syphilis had been made.

Sexual contact was defined as oral, vaginal or anal sex. Patients who reported sexual intercourse with men only or those who had sex with both men and women were considered to be MSM. STD positivity rate was calculated as the number of positive test results divided by the number of tests performed for each pathogen.

Comparison of risk behaviors and morbidity between MSM and heterosexual men were performed using chi-square test for the categorical independent variables or Student's *t*-test for the continuous independent variables. Factors associated with STD diagnosis in the univariate analysis at *P* values < 0.05 were included in a multivariate analysis, generating odds ratios and 95% confidence intervals. Analysis was conducted using SPSS 14.0 package for Windows (SPSS Inc., Chicago, IL, USA).

RESULTS

From November 2002 through April 2008, 10,262 patients attended the Tel Aviv walk-in STD clinic, and 8595/10,262 (83.7%) had a single visit. Of those, 5146/8595 (59.9%) were males. Sex with men only was reported by 737/5146 (14.3%), sex with both men and women by 327 (6.3%), sex with women only by 3755 (73.0%), and for 327 (6.3%) the gender of their sex partner was missing. STD positivity rates in males tested in our clinic for *C. trachomatis* (N=92/4202), urethral *N. gonorrhoea* (N=78/4213), HIV (N=66/4333) and infectious syphilis (N=6/3317) were 2.2%, 1.85%, 1.5% and 0.18%, respectively.

The characteristics of this study population are described in Table 1. MSM who visited the STD clinic were younger, more often Israeli born and circumcised compared with heterosexual males. Behavioral characteristics, such as substance use in conjunction with sexual acts, previous STD diagnosis, a greater number of sexual partners, performance of oral and anal sex and an earlier sexual debut, were all significantly more prevalent in MSM than in heterosexual men. The prevalence rates of urethral and pharyngeal gonorrhea, as well as HIV, were significantly higher among MSM compared with heterosexual men, while the prevalence rate of urethral chlamydia was higher among heterosexual males than among MSM [Figure 1].

MSM who were diagnosed with urethral or pharyngeal *N. gonorrhoea*, urethral *C. trachomatis*, or had positive serology to HIV, HBsAg or infectious syphilis were more commonly sex workers, utilized substances during sexual acts, had a prior STD infection, had a greater number of sexual partners and reported irregular (replied "never" or "sometime" to the question) condom use during anal sex compared with MSM who were not diagnosed with an STD [Table 2].

NYC = New York City

NAAT = nucleic acid amplification tests

TPHA = *Treponema pallidum* hemagglutination

FTA = fluorescent treponemal antibody

The independent correlates for STD in MSM are presented in Table 3. MSM who were previously diagnosed with STD were nearly twice as likely to be diagnosed with a current STD as MSM who were not diagnosed with STD in the past. Those who had more than six sexual partners in the last 3 months had a twofold higher chance of developing STD than men who had a smaller number of partners during this period. Of particular note, men who perform anal sex were not at significant risk for developing STD compared to those who were not involved in anal sex; yet MSM who did use condoms during anal intercourse reduced their chance of becoming infected with STD by 80%.

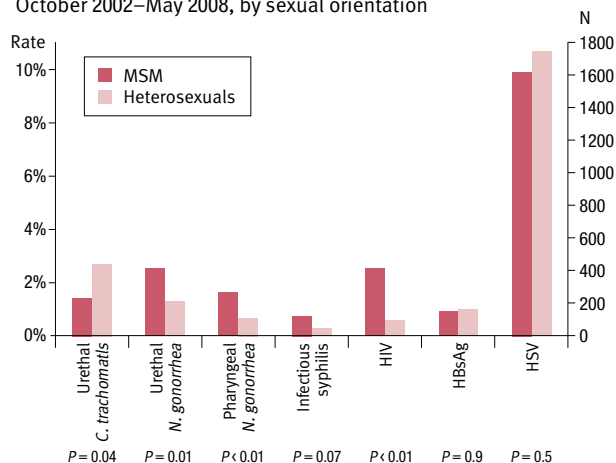
DISCUSSION

This is the first study describing the STD burden among MSM in Israel, demonstrating that the prevalence of most STD were higher among MSM attending the STD clinic than in heterosexual men, reflecting their riskier sexual practices. Contrarily, *C. trachomatis* infection was more prevalent among heterosexuals, as found in other studies [7-9]. The positivity rate of HBsAg serology was similar in MSM and heterosexuals, and it is probable that the higher occurrence in heterosexual intravenous drug users [10,11] balanced the positivity rate in MSM.

The use of recreational drugs during sex was significantly more prevalent among MSM. Substance use can contribute to more risky sexual behavior, as its influence may distort one's initial intention to use a condom or may have weakened negotiation skills demanding use of a condom from the sexual partner. These findings correlate with a previous study performed in gay men in Israel [12] and remain a priority for health educators.

STD/HIV rates among males in the present study – 2.2% positivity for *C. trachomatis*, 1.85% for urethral *N. gonorrhoea*, 1.5% for HIV and 0.18% for infectious syphilis – were lower

Figure 1. STD positivity rates among males tested in the STD clinic, October 2002–May 2008, by sexual orientation



STD = sexually transmitted infection, MSM = men who have sex with men

Table 1. Characteristics of MSM and heterosexual men visiting the STD clinic, October 2002–May 2008

		MSM N=1064	Heterosexuals N=3755	P value	Univariate OR (95% CI)
Age (yrs)	31	408 (46.8)	2003 (53.4)	< 0.001	1.9 (1.6–2.1)
	15–30	656 (61.7)	1751 (46.6)		
Israeli born		882 (85.5)	2585 (70.1)	< 0.001	2.5 (1.9–3.1)
Not circumcised		40 (12.0)	217 (17.0)	0.03	1.3 (1.1–2.0)
Ever paid for a sex worker		68 (6.6)	1002 (27.3)	< 0.001	5.3 (3.8–6.3)
Has a current steady partner		357 (38.6)	1669 (49.9)	< 0.001	1.6 (1.3–1.8)
Substance use during sex		425 (40.7)	1332 (36.2)	0.04	1.2 (1.1–1.4)
Previous diagnosis of STD		171 (17.0)	365 (9.9)	< 0.001	1.9 (1.5–2.8)
6 partners in the last 3 months		280 (27.7)	487 (13.5)	< 0.001	2.5 (2.1–2.9)
Performs oral sex		1037 (98.0)	3174 (85.5)	< 0.001	8.3 (5.4–13.0)
Performs anal sex		968 (92.1)	1207 (33.4)	< 0.001	23.3 (18.4–29.5)
Irregular condom in anal sex		577 (65.3)	962 (93.6)	< 0.001	2.5 (2.1–3.1)
Age < 16 at sexual debut		353 (42.4)	1383 (37.9)	0.02	1.2 (1.1–1.4)
STD* diagnosis at current visit		82 (7.7)	171 (4.6)	< 0.001	1.8 (1.4–2.4)
Symptomatic patients [∞] of men diagnosed with STD*		40/143 (28.0)	100/376 (26.6)	0.7	1.1 (0.6–1.9)

*Pharyngeal or urethral *N. gonorrhoea*, urethral *C. trachomatis*, as well as HIV and HBsAg serology

[∞]Urethral discharge and/or dysuria

OR = odds ratio, CI = confidence interval

Table 2. Comparison between MSM diagnosed with STD and MSM not diagnosed with STD*, October 2002–May 2008

		MSM diagnosed with any STD N=82	MSM not diagnosed with STD N=982	P value	Univariate OR (95% CI)
Age (yrs)	31	38 (46.3)	370 (37.7)	0.9	1.4 (0.9–2.5)
	15–30	44 (53.7)	612 (62.3)		
Israeli born		62 (78.5)	820 (86.1)	0.07	1.4 (0.9–3.4)
Non-circumcised		6 (18.2)	34 (11.4)	0.3	0.6 (0.2–1.5)
Ever paid for a sex worker		8 (10.0)	60 (6.3)	0.2	1.7 (0.7–3.4)
Sex worker		14 (17.3)	84 (8.8)	0.02	2.2 (1.2–4.0)
Has a current steady partner		27 (35.5)	330 (38.9)	0.6	1.0 (0.9–1.1)
Ever utilized substance use during sex		42 (51.9)	383 (39.7)	0.02	1.6 (1.1–2.6)
Previous diagnosis of STD		23 (28.4)	148 (16.0)	0.04	2.1 (1.4–3.5)
6 partners in the last 3 months		34 (43.1)	246 (26.4)	0.02	2.1 (1.3–3.4)
Performs oral sex		80 (97.6)	957 (98.1)	0.7	1.2 (0.3–5.5)
Performs anal sex		79 (96.3)	889 (91.7)	0.2	2.4 (0.7–7.7)
Irregular condom use during anal sex		51 (68.3)	343 (34.9)	< 0.001	2.0 (1.5–2.3)
Age < 16 at sexual debut		33 (45.2)	320 (42.2)	0.6	1.1 (0.7–1.8)

*Pharyngeal or urethral *N. gonorrhoea*, urethral *C. trachomatis*, as well as HIV and HBsAg serology

Table 3. Multivariate analysis for determinants influencing STD* diagnoses among MSM

Attribute	Multivariate OR (95% CI)	P value
Previous diagnosis of STD	1.8 (1.2–2.9)	0.03
> 6 partners in the last 3 months	1.9 (1.2–4.3)	0.02
Infrequent condom during anal sex	2.1 (1.8–2.5)	0.01

*Pharyngeal or urethral *N. gonorrhoea*, urethral *C. trachomatis*, as well as HIV and HBsAg serology

than those found in an STD clinic in San Francisco, USA [13]: 3.2%, 3.8, 3% and 0.8–2%, respectively, or at an STD clinic in Athens, Greece [14]: 6.6%, 5.3%, 0.4% and 1.6%, respectively, and also lower than MSM visiting the STD clinic in Rotterdam, the Netherlands [15]. The dissimilarities between STD/HIV rates in our study and other clinics may be partially attributed to the lower STD/HIV rates in the general population in Israel as compared with other developed countries, to the possibility that we captured more lower risk patients than STD clinics elsewhere, or to the asymptomatic nature of most of our STD clients. The HSV-2 seropositivity rate was relatively low in our study and may be related to the higher proportion of Israeli born individuals, as found in another Israeli study [16].

Our STD clinic is unique in its central location, availability during afternoons and evenings, outreach activities and free anonymous testing and treatment, as well as the non-judgmental attitude of the trained staff. All these factors are aimed at decreasing possible barriers for those seeking medical services related to STD; therefore, men who are at high risk for STD acquisition likely feel comfortable attending our clinic. In view of all these particularities, we believe that our findings represent the highest known STD burden in Israel both among MSM and heterosexual men.

The high burden of STD/HIV among MSM in our study is a call for action to public health officials in Israel as well as for gay organizations to design innovative responses targeting subpopulations of MSM who are at high risk for developing STD. Attributes, such as previous diagnosis of STD, multiple sexual partners and inconsistent use of a condom during anal sex, were found to be predictive for STD in our study and should be addressed by health educators in non-governmental organizations as well as by the government in future interventions. Active outreach as performed by our mobile STD unit visiting gay-related venues and gay internet sites are efficient measures but are not sufficient. Additional initiatives should be employed, such as secondary prevention among MSM infected with STD/HIV, interventions that address local gay Israeli culture and other contextual factors, periodic screening of asymptomatic MSM who are at risk for developing STD/HIV, improving trust between MSM community and health providers [17], and incor-

porating the internet as a central route of prevention.

Not all males diagnosed with urethral *C. trachomatis* or *N. gonorrhoea* were symptomatic. The high specificity of NAAT Cobas testing (93.9–100% for *N. gonorrhoea* [18] and 97.7% for *C. trachomatis* [19]) allows screening of males according to their sexual risk and not only to their urethral complaints. This has a potential effect on public health and on the control of STD in the community [20].

There is a growing body of literature supporting male circumcision as a possible preventive measure against STD/HIV [21]. In the current study, circumcision was more prevalent among MSM than among heterosexual men, probably since most of the latter were non-Jews and were born outside of Israel, mostly immigrants from the former Soviet Union. MSM who were uncircumcised had higher STD positivity rates than MSM who were circumcised (18.2% and 11.4%, respectively). Although the difference was not statistically significant, it is likely that a non-urethral, but rather rectal acquisition of those infections (or a possible oral infection in cases of syphilis) among circumcised men was the main route of transmission, as found in other countries [22,23].

Our findings are subject to potential limitations. First, this cross-sectional study design limits the assumptions that can be made on causality. However, an advantage of the cross-sectional design used in this investigation is that exposure and outcome were obtained simultaneously and recall bias is therefore minimized. Second, these findings may not be generalized to all gay and heterosexual men in the community, as they are limited only to those tested at our STD clinic. In spite of this possible selection bias, our clinic is located in central Tel Aviv, which is the largest metropolitan city in Israel. Tel Aviv offers a wide variety of gay-related venues and it is believed that our large catchment area included most MSM who live in central Israel. It was also assumed that a greater percentage of individuals who were involved in higher risk sexual behavior are most likely to be seen at our free anonymous clinic rather than in most other medical settings, which are not organized for the particular needs of these special populations. Third, our findings pertaining only to male patients who had made a single visit to the clinic were analyzed, as also performed elsewhere [24]. Lastly, data retrieved from interviews regarding sexual behaviour are subject to reporting bias that includes the under-reporting of socially stigmatized behaviors and, therefore, our findings might underestimate the level of risk for both gay and heterosexual men.

In conclusion, STD/HIV rates among MSM visiting our clinic were higher than among heterosexual males, which correlated to their high risk behavior. Unique characteristics of MSM found in our study, such as sex work, substance use, previous diagnosis of STD, multiple partners and inconsistent use of condom during anal sex, should be addressed in innovative interventions to prevent STD/HIV in the MSM community in Israel.

HSV = herpes simplex virus

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Corresponding author:

Dr. Z. Mor

Levinsky Clinic, 108 Levinsky St., Shop #5721, Tel Aviv 66990, Israel

Phone: (972-3) 537-3738

Fax: (972-3) 687-5157

email: zohar.mor@rml.health.gov.il

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