



Original article

Sexual Behaviors and Risk for Sexually Transmitted Infections
Among Teenage Men Who Have Sex With Men

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A B S T R A C T

Objectives: To report on sexual behaviors and sexually transmitted infections (STIs) among men who have sex with men (MSM) in their teens, when many MSM engage in their first sexual experiences.

Methods: MSM aged 16 to 20 years were recruited via community and other sources. Men completed a questionnaire about their sexual behaviors and were screened for gonorrhea, chlamydia, syphilis, and HIV.

Results: Two hundred men were included. The median age was 19 years. The median age at first insertive or receptive anal intercourse was 17 years. Half of men reported sex with mainly older men: these men were more likely to engage in receptive anal intercourse (48% vs. 25%, $p < .001$) than other men. Most men had engaged in insertive (87%) and receptive (85%) anal intercourse in the prior 12 months with 60% and 53% reporting inconsistent condom use with insertive and receptive anal intercourse partners, respectively. The median number of insertive anal intercourse partners was 3 and 1.5 ($p < .001$) among men reporting inconsistent and consistent condom use with insertive anal intercourse over the prior 12 months. The median number of receptive anal intercourse partners was 3 and 2 ($p = .006$) among men reporting inconsistent and consistent condom use with receptive anal intercourse over the prior 12 months. Pharyngeal gonorrhea, rectal gonorrhea, urethral chlamydia, rectal chlamydia, and syphilis were detected in 3.0%, 5.5%, 3.0%, 4%, and 2.0% of men, respectively. All men were HIV negative.

Conclusion: Many of the teenage MSM in this study were at risk for STI. Preventative messages and STI screening interventions that are age appropriate need to be developed to reduce HIV and STI risk in this under-recognized group.

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IMPLICATIONS AND
CONTRIBUTION

This study is significant as it is one of the first to date to elucidate among teenage men who have sex with men (MSM): (1) age at first sexual behavior of each type, with both men and women; (2) detailed sexual behaviors implying risk for sexually transmitted infections (STIs) and HIV; and (3) detection of STIs.

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Many men who have sex with men (MSM) engage in sexual behaviors that place them at high risk for STIs, including HIV [1–5]. Globally, infections such as gonorrhea, chlamydia, syphilis, and HIV continue to be diagnosed at high rates among MSM [6–8]. Bacterial and viral STIs facilitate HIV transmission and are mostly asymptomatic, requiring frequent screening for optimal detection [5,9–11].

Over time, the age at first anal intercourse reported by MSM in Australia and presumably elsewhere has fallen [12]. Some studies have suggested that in some countries younger MSM may be at higher risk for HIV infection than older MSM. In a study conducted in two large cities in China, MSM aged 18–24 years accounted for 58% of all HIV cases detected in a sample of 429 MSM aged 18–64 years [8]. In the United States, teenage and young MSM have accounted for an increasing proportion of new HIV cases [13]. Among U.S. males aged 13–19 years, around 90% of all new HIV diagnoses are from male-to-male sexual contact [13]. Limited data suggest that teenage and young MSM may account for a significant proportion of newly reported STI cases among MSM. For example, MSM aged 29 years or younger in South Australia accounted for 49% of chlamydia cases, 52% of gonorrhea cases, and 21% of syphilis cases [14].

The Australian National Secondary Students and Sexual Health survey showed that among final year school boys: 8% had a same-sex partner in their most recent sex and 30% did not use a condom during their most recent sexual intercourse [15]. However, data on sexual behaviors specifically among teenage MSM are scarce. Existing literature mostly contains information on MSM aged in their 20s rather than those of teenagers or adolescents [8,14,16]. This study aimed to describe the sexual behaviors among teenage MSM in Melbourne, Australia.

Methods

Subjects and recruitment

Men in this study were participants in the Human Papillomavirus in Young People Epidemiological Research (HYPER) study, which aimed to examine human papillomavirus (HPV) infection among teenage MSM. To be eligible for the study, participants had to be males aged between 16 and 20 years who self-identified as same sex attracted. Details on methods for recruitment have been reported elsewhere [17]. Briefly, men were recruited between September 2010 and August 2012 via community organizations and social groups targeting teenage gay males (such as Minus 18), gay clubs at several Melbourne universities, gay community events (such as the MidSumma Gay and Lesbian Festival), and other venues.

A self-administered questionnaire was used to collect information on demographics, detailed sexual behaviors, and condom use as well as self-reported STI testing history. Men were also screened for urethral and rectal chlamydia by strand displacement assay and pharyngeal and anal gonorrhea by culture. Blood was obtained for hepatitis A and B, syphilis, and HIV serology.

Limited data on sexual behaviors from men in the HYPER study have previously been presented as they relate to prevalence of HPV among men in the study [17]. In this article, we present additional detailed data on sexual risk

behaviors among study participants. Consistent condom use was defined as always using a condom with all insertive/receptive anal sex partners, and inconsistent condom use as not using a condom all the time with any insertive/receptive anal sex partners.

Statistical analysis

Sample characteristics were compared using descriptive statistics. Median and interquartile ranges (IQRs) were used for age at first individual sexual behaviors, number of sexual partners, and time since individual sexual behaviors first occurred. Proportions and corresponding 95% confidence intervals (CIs) were calculated for the prevalence of positive STI test results. The chi-squared test was used to compare the proportion of men engaging in receptive anal intercourse between men whose male partners were mostly older and all other men. The rank-sum test was used to compare the number of sexual partners in the past 12 months between men reporting consistent and inconsistent condom use in anal/vaginal intercourse. The rank-sum test was also used to test whether men who mostly had sex with older partners started insertive or receptive anal sex earlier than other men. Kaplan–Meier survival curves were used to present the cumulative proportion of men who reported first engaging in specific sexual behaviors by age. Statistical analyses were conducted using STATA 12.0.

Ethics and consent

The study was approved by the Alfred Hospital Research Ethics Committee (project number 174/10) and the University of Melbourne Ethics Committee (project ID 1034462). Written informed consent was obtained from each participant. For the consent of minors (16- to 17-year-olds), an assessment of competency to participate in the study was undertaken by the research nurse. The HYPER study was also registered on The Australian New Zealand Clinical Trials Registry (ACTRN12611000857909).

Results

Participant characteristics

Two hundred males recruited in Melbourne, Australia, were included in the study. The median age was 19. Most men (137, 68.8%) were in the final year of their secondary school education at the time of recruitment. Sixty-four percent (127 of 198) of men were recruited from sexual health or general practice clinics and 36% (71 of 198) from community organizations and events.

Sexual experiences

Age at first sex. The age at which men first engaged in specific sexual behaviors with men and women are listed in Table 1, respectively. The median age at first insertive oral sex and first receptive oral sex with men was 16 years. The median age at first insertive anal intercourse and first receptive anal intercourse with men was, later, at 17 years. The median age at first oral sex and first vaginal intercourse with women was 16 years.

Table 1
Sexual behaviors among 200 teenage MSM

Sexual behavior	n	Percent/median/IQR/p
A: Sex with men		
Age difference with male partners		
Age of partners (n, %)		
Mostly older	100	50.3
Mostly younger	10	5.0
Similar ages	43	21.6
Different ages	46	23.1
Age difference if partners were mostly older (median, IQR)	5	3–9
Age at first sexual behaviors with a man (median, IQR)		
Kissing	16.2	15.1–17.5
Insertive oral sex ^a	16.5	15.3–18.0
Receptive oral sex ^b	16.4	15.4–18.0
Insertive anal intercourse ^c	17.3	16.3–18.5
Receptive anal intercourse ^d	17.0	16.0–18.5
Licking another man's anus	17.8	16.1–18.6
Anus licked by another man ^e	18.4	17.0–19.5
Anus fingered by a man ^e	18.3	17.1–19.4
Anus rubbed by another man's penis ^e	18.1	16.8–18.8
No. of male partners in the past 12 months for each behavior (median, IQR)		
Kissing	7	4–15
Insertive oral sex ^a	5	3–10
Receptive oral sex ^b	4	2–10
Insertive anal intercourse ^c	2	1–5
Receptive anal intercourse ^d	3	1–5
Licking another man's anus	2	1–4
Anus licked by another man	2	1–3
Anus fingered by a man	1	1–3
Anus rubbed by another man's penis	1	1–2
Condom use with anal intercourse with men in the past 12 months (n, %)		
Condom used always with insertive anal intercourse ^c	63	40.0
Condom use during last insertive anal intercourse ^c	108	63.9
Condom used always with receptive anal intercourse ^d	75	46.9
Condom use during last receptive anal intercourse ^d	111	67.7
Median no. of insertive anal intercourse partners in the past 12 months (n, p)		<.001 ^j
Men always using a condom with insertive anal intercourse (78)	1.5	
Men not always using a condom with insertive anal intercourse (95)	3	
Median no. of receptive anal intercourse partners in the past 12 months (n, p)		.006 ^j
Men always using a condom with receptive anal intercourse (85)	2	
Men not always using a condom with receptive anal intercourse (85)	3	
B: Sex with women		
Age at first sexual behaviors with a woman (median, IQR)		
Kissing	15.0	13.3–16.1
Insertive oral sex ^f	16.3	15.0–17.2
Orovaginal sex ^g	16.8	16.0–18.0
Vaginal intercourse	16.7	15.0–17.5
No. of female partners in the past 12 months for each behavior (median, IQR)		
Kissing	2	0–5
Insertive oral sex ^f	0	0–1.5
Orovaginal sex ^g	1	0–2
Vaginal intercourse	0	0–1
Condom use with vaginal intercourse in the past 12 months (n, %)		
Condom use always in vaginal intercourse	9	52.9
Median no. of vaginal intercourse partners in the past 12 months (n)		.139 ^j
Men always using a condom with vaginal intercourse (9)	1	
Men not always using a condom with vaginal intercourse (8)	2.5	
C: Sex with both men and women in the past 12 months		
Oral sex with men and women (n, %) ^h	18	9.0
Anal intercourse with men and vaginal intercourse with women (n, %) ⁱ	12	6.0

IQR = interquartile range; MSM = men who have sex with men.

^a Insertive oral sex with another man: participant's penis into another man's mouth.

^b Receptive oral sex with another man: another man's penis into participant's mouth.

^c Insertive anal intercourse with another man: participant's penis into another man's anus.

^d Receptive anal intercourse with another man: another man's penis into participant's anus.

^e Data from 30 men who reported no receptive anal intercourse.

^f Insertive oral sex with a woman: participant's penis in a woman's mouth.

^g Orovaginal sex with a woman: participant's mouth on woman's vagina.

^h Either insertive or receptive oral sex with men *plus* either insertive oral or orovaginal sex with women.

ⁱ Either insertive or receptive anal intercourse with men *plus* vaginal intercourse with women.

^j *p* Value from rank-sum test.

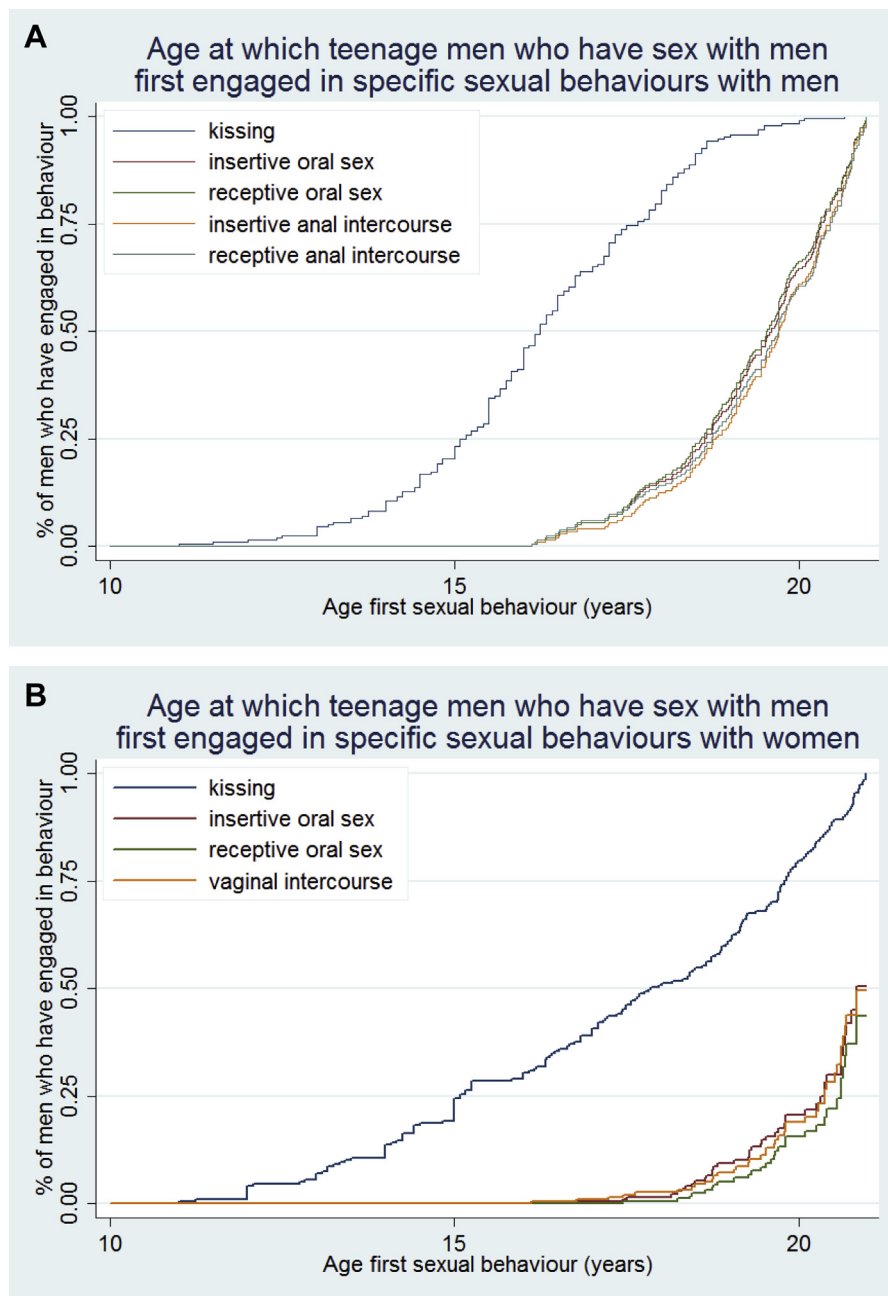


Figure 1. Age at which teenage men who have sex with men first engaged in specific sexual behaviors with men and women.

Sexual experiences

Sex with men. Figure 1A shows Kaplan–Meier survival curves for the cumulative proportion of men who reported first engaging in each type of sex with a man by age. By 19 years of age, 93.0%, 94.5%, 81.5%, and 83.0% of men had insertive oral sex, receptive oral sex, insertive anal intercourse, and receptive anal intercourse, respectively, with men.

At recruitment, the median time since first ever insertive oral sex, receptive oral sex, insertive anal intercourse, and receptive anal intercourse with a man was 2.7, 2.6, 1.8, and 1.9 years,

respectively. Most men had engaged in insertive (86.5%) and receptive (85.0%) anal intercourse in the past 12 months but with a lower number of male partners than for oral sex. Only 34.7% and 38.2% of men reported consistent condom use with all insertive and receptive anal intercourse partners since their first anal intercourse experience, respectively (data not shown).

Half of men reported that they mostly had sex with men who were older than them, and only 5.0% reported that they mostly had sex with men who were younger than them. Among those who reported mainly older male partners, partners were a

median of 5 years older than men in the study. Men whose male partners were mostly older were more likely to engage in receptive anal intercourse than other men (47.5% vs. 24.5%, $p = .001$). For insertive anal intercourse in prior 12 months, inconsistent condom use was equally reported by men whose male partners were mostly older and other men (64.1% vs. 43.8%, $p = .314$). For receptive anal intercourse in prior 12 months, inconsistent condom use was equally reported by men whose male partners were mostly older and by all other men in the study (63.5% vs. 54.7%, $p = .255$). Men who mostly had sex with older partners did not start insertive anal sex (17.7 vs. 17.2 years, $p = .489$) or receptive anal sex (17.1 vs. 17.0 years, $p = .746$) earlier than other men.

The numbers of male partners with whom men engaged in each sexual behavior are listed in Table 1. Men reported a median of three receptive anal intercourse partners over the past 12 months. In the past week, the proportion of men who had engaged in insertive oral sex, receptive oral sex, insertive anal intercourse, and receptive anal intercourse with men was 37.9%, 39.9%, 20.9%, and 22.5%, respectively. Among men who reported inconsistent condom use with insertive anal intercourse over the prior 12 months, the median number of insertive anal intercourse partners was 3. This was significantly higher than the median of 1.5 insertive anal intercourse partners reported by men who used condoms consistently for insertive anal intercourse ($p < .001$). Similarly, among men who reported inconsistent condom use with receptive anal intercourse over the prior 12 months, the median number of receptive anal intercourse partners was 3. This was significantly higher than the median of two receptive anal intercourse partners reported by men who used condoms consistently for receptive anal intercourse ($p = .006$).

Sex with women. Figure 1B shows Kaplan–Meier survival curves of the cumulative proportion that reported each type of sex with a woman by a particular age. By 19 years of age, 20.0%, 15.0%, and 19.0% had insertive oral sex, receptive orovaginal sex, and vaginal intercourse, respectively, with women. Five percent had vaginal sex with women before 16 years of age.

Under half (85 of 200) of men reported any type of sex with a woman, and 19.5% (39 of 200) had ever had vaginal intercourse. Men who had engaged in vaginal intercourse with a woman reported a median of two lifetime vaginal intercourse partners, with 36.8% using a condom with all vaginal intercourse partners since their first vaginal intercourse.

Only 1.0%, 2.0%, and 2.0% had engaged in insertive oral sex, orovaginal sex, and vaginal intercourse, respectively, with a woman in the past week. Among men who reported inconsistent condom use with vaginal intercourse over the prior 12 months, the median number of vaginal intercourse partners was 2.5. Men who used condoms consistently for vaginal intercourse reported a median of one vaginal intercourse partner ($p = .139$).

Sex with both men and women. Bisexual behaviors were reported by the minority of men with 22% ever having oral sex with both men and women and 18% ever having both anal intercourse with men and vaginal intercourse with women (Table 1). Among the 36 men who had anal intercourse with men and vaginal intercourse with women, most ($n = 22$, 61%) first had vaginal intercourse with women before they first had anal intercourse with men.

Sexually transmitted infection testing and diagnosis

Most men (70%, 140 of 200) reported having been previously tested for STIs. Pharyngeal gonorrhea, rectal gonorrhea, urethral chlamydia, rectal chlamydia, and syphilis were detected in 3.0% (95% CI 1.1%–6.4%), 5.5% (95% CI 2.8%–9.6%), 3.0% (95% CI 1.1%–6.4%), 4% (95% CI 1.7%–7.7%), and 2.0% (95% CI .5%–5.0%) of men, respectively, at the study visit. One man was a hepatitis B carrier (95% CI .0%–2.8%), and 29.0% (95% CI 22.8%–35.8%) were immune to hepatitis A. All men were HIV negative.

Discussion

In this study, one of the few to focus on the sexual behaviors among teenage MSM, most teenage MSM were already sexually active with other men, with many engaging in sexual behaviors that place them at risk of infection from an early age. These data suggest the presence of STI risk within a group that has until now been under-recognized. The results indicate the need for greater health promotion and prevention efforts to reduce risk of STIs including HIV among teenage MSM. Behavioral interventions and regular STI screening of MSM, which have been shown to improve detection of bacterial STIs, need to include teenage MSM [11,18].

There are a number of limitations to this study. Despite the fact that a variety of sources were used to recruit men, we cannot be sure if the men included in the study are broadly representative of teenage MSM in our or other populations. Younger teenagers were under-represented in the sample. As some men were referred to the study via clinical sites, it is possible that this is biased toward higher risk men and men with STIs. We did not categorize sexual partners into regular or casual partners; thus it was not possible to know whether inconsistent condom use was with regular or casual sexual partners.

Published data on sexual risk behaviors and STI among teenage MSM are limited, with no previous studies that focused on these using representative samples. In a study of 12- to 24-year-old MSM from eight cities in the United States, 15% reported sex with someone with HIV and 25% had a history of STI(s) [19]. However, in contrast to our study, only 13% (79 of 595) of men in that study were aged under 18 years, 8.7% were HIV positive, and a third had been homeless, likely representing a more socio-economically disadvantaged group. In a survey of adolescent males attending high schools in Massachusetts, compared with males who had sex with females only, males who had bisexual experience were more likely to have had a higher number of sex partners, to have had recent unprotected intercourse, and to have injected drugs [20]. In that study, 34% of males reporting bisexual experience reported a prior STI diagnosis compared with only 3% of males who had female partners only. In a study of MSM aged 18 and 19 years in New York, the age at first male sexual contact was relatively young at 14 years, 20% reported unprotected anal intercourse within the past 30 days, and 16% reported transactional sex [21].

In our study, half of the teenage MSM reported having sex with mainly older males. This age difference has been reported previously [22,23]. An Australian study of 1,476 MSM showed that age differences between gay men made little difference to the likelihood of engaging in unprotected anal intercourse with either regular or casual partners, but they were associated with sexual position during anal intercourse [23]. In our study, men whose partners were older were more likely to take the receptive

position during anal intercourse. The tendency for younger MSM to take the receptive position during anal intercourse has also been reported elsewhere [23–25]. Even if sexual risk behavior is similar regardless of differences in age between partners, given that HIV prevalence is generally higher among older MSM, teenage HIV-negative men engaging in unprotected receptive anal intercourse with older men have an elevated risk of HIV infection [23].

Data on teenage MSM's sexual behaviors are essential to determine whether STI/HIV preventative and clinical interventions should be a priority and to inform the design of these interventions. There are a number of potential barriers to successful STI/HIV prevention in this population, and without appropriate prevention strategies, teenage MSM may be left to explore the realm of sex and sexuality uninformed, through trial and error, putting them at unnecessarily increased risk [26]. Teenage MSM require access to appropriate information and resources to enable them to develop the confidence to develop strategies to reduce the possibility of infections during sexual encounters with other men. In many settings, stigma against homosexuality and negative experiences including harassment at school may lead to isolation and a dearth of information and discussion about safer sex and HIV prevention [27]. Fear of disclosure and social isolation may be associated with low self-esteem, depression, and a lack of access to the peer support and prevention services that are available to older gay men [28]. Socioeconomic disadvantage may also contribute to the lower access to STI/HIV prevention services among teenage MSM [29]. School-based sex education should support the needs of all sexually active young people including those who are same sex attracted [22].

Our study found a relatively low percentage of MSM with any lifetime female partners and early vaginal sex with women. Glick et al. reported partnership patterns among young MSM with a high prevalence and incidence of STI/HIV. In that study, which included 49 men aged 20 years or younger, 24% of men commenced sex with a woman when they were 16 years old or younger. In our study, however, 19% had ever had vaginal sex with women and only 5% commenced vaginal sex with a woman when they were 16 years old or younger.

Although none of the men in this study were diagnosed with HIV, the risk behaviors reported clearly place some at risk for HIV acquisition. Preventative messages and interventions that are age and culturally appropriate need to be developed to reduce the risk of HIV among young MSM. Further research on contextualized and efficacious interventions targeting teenage MSM is required. Smartphone application and Internet-based interventions appear to be acceptable among young MSM and may be effective in reducing STI/HIV-related risk behaviors [30,31]. These and other novel interventions are worthy of further investigation.

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