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Delayed application of condoms with safer and unsafe sex: factors associated with HIV risk in a community sample of gay and bisexual men

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While condom use remains one of the most effective measures to prevent the sexual transmission of HIV, decreasing attention appears to be given to its importance and techniques of effective use relative to potential biomedical technologies. This paper focuses on delayed condom application (DCA), one practice which has been implicated in HIV transmission among gay and bisexual men. It examines the prevalence of the practice within a gay community and explores factors associated with condom use among those who practice only safer sex and those who report at least some unprotected anal sex. Data were taken from an anonymous, cross-sectional study of a self-identified sample of gay and bisexual men ($N = 5080$). Among 2614 men who responded to relevant questions, multivariate polytomous logistic regressions were used to identify variables associated with DCA. Nearly, half of the men reported delayed condom application for insertive anal intercourse in the previous 12 months. While the majority of this group also reported episodes of unprotected anal sex, more than 25% of those who reported delayed application only reported safer sexual practices. Most socio-demographic variables found to be associated with unsafe sex in other studies were not associated with DCA. Negative condom use experiences such as tearing, splitting and slippage were associated with delayed application among the two groups. DCA, which may be considered by men as an effective harm reduction strategy requires attention. Interventions to address this behavior need to consider the physical issues of condom use along with the complex array of social, structural, psychological, and interpersonal issues.

Keywords: gay and bisexual men; condom use; HIV; sexual behavior

Condom use remains one of the most effective prevention measures for the sexual transmission of HIV among sexually active populations (Johnson, Hedges, & Diaz, 2002; Weller & Davis-Beaty, 2002). Recently, despite the effectiveness of condoms, there is growing competition with promised biomedical prevention interventions for a prominent focus at scientific conferences and in HIV prevention discourse (Kippax, 2007). Furthermore, in the literature decreasing attention has been given to the importance and techniques of effective condom use. This paper focuses on one practice implicated in HIV transmission; namely delayed condom application (DCA) – the use of condoms during vaginal or anal intercourse, but only after some unprotected penetration has occurred.

In the literature, terms such as "late application of condoms" (De Visser & Smith, 2000), "unsafe protected sex" (Quirk, Rhodes, & Stimson, 1998), "condom cheats" (Browne & Minichiello, 1994), "nudging" (Kippax et al., 2003), and "dipping" (Hoff et al., 2004) have been used to describe variations in what we define as DCA. We prefer the latter term for three reasons: First, it aptly identifies the particular behaviors implicated in HIV transmission. Second, it describes a penetrative act where seminal fluid or pre-ejaculate is more likely to be transferred rather than an act such as a "dip" where seminal fluid may or may not be transferred. Third, it is not a colloquial term but one which reflects some of the seriousness of the sexual health concern and consequences (Calzavara et al., 2003; Civic et al., 2002; De Visser, 2004).

The practice of DCA was initially identified in focus groups with drug users (Quirk et al., 1998). Subsequent qualitative studies found this practice among women (Civic et al., 2002), heterosexuals (De Visser, 2004) and gay and bisexual men (Calzavara et al., 2003). DCA is now known to be associated with risk for HIV infection. Calzavara and colleagues found that gay and bisexual men who engaged in receptive anal intercourse with DCA were at nearly sixfold greater risk of HIV seroconversion compared to HIV-negative controls after adjustment

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for also having engaged in fully unprotected receptive anal intercourse.

Few studies of the prevalence of the delayed application of condoms have been undertaken (Civic et al., 2002; De Visser, 2004; De Visser & Smith, 2000; Quirk et al., 1998). Much of this research relates to concerns for prevention of pregnancy rather than the transmission of sexual transmitted diseases (STD) (De Visser, 2004) and may be of less importance to the sexual health of gay and bisexual men.

While a direct correlation between delayed application of condoms and HIV risk among gay and bisexual men has been reported, the prevalence of this practice within the larger community of gay and bisexual men remains unclear. The present analysis documents the prevalence of the delayed application of condoms among gay and bisexual men and explores the factors associated with DCA among both those who claim to practice only safer sex and those who reported at least one episode of unprotected anal sex compared to those who reported no DCA and no unprotected anal sexual activities.

Methods

Study population

The data used for analysis were from an anonymous, cross-sectional study of socio-behavioral issues and sexual health in a community sample of self-identified gay and bisexual men. This survey was a venue-based study of 5080 men recruited through gay bars, bathhouses, and community groups from 13 cities or regions in the province of Ontario, Canada.

A purposive sampling strategy was utilized to ensure the diversity of gay and bisexual men in the sample. Special efforts were made to involve community groups to help reach gay and bisexual men who might not frequent gay-identified commercial establishments. In compliance with legal age requirements, only men over the age of 15 years were included. Approval was received from the University of Toronto. Research Ethics Board. Informed verbal consent was obtained from all participants before data collection.

Procedure

Prior to data collection, an overall sampling strategy was developed based on a scan of the venues to estimate the number of potential respondents who might be recruited within specific venues at different times of the day (Joseph et al., 1984; Myers, Locker, Orr, & Jackson, 1991). Efforts were made to ensure as diverse a sample of men who have sex with men (MSM) as possible and at the same time sample in proportion to venue size. For specific language groups, sampling was undertaken at specific events where these groups were present. Data were collected by trained coordinators and recruiters and varied by the day of the week, time of day and venue, over a six-month period. Respondents in each of the venues were selected depending on the venue and sample size required. In larger venues a systematic approach was utilized. The questionnaire was translated into seven languages (English, French, Mandarin, Portuguese, Spanish, Tamil and Vietnamese).

Measures

The independent variables examined in this analysis were grouped in eight major categories including socio-demographic characteristics, social life, sexual health, sexual activity (lifetime, past 12 months and past three months) and relationships, condom use, genital modification, drug use and HIV testing (see Table 1). In addition, the use of 17 recreational drugs in the previous 12 months and any injection drug use in an individual's lifetime were examined (see Table 2).

We examined both the prevalence of DCA prior to receptive and insertive anal intercourse. In this paper, for the analysis of factors related to DCA, we focused on insertive anal intercourse for a number of reasons. First, our data were limited, and in the case where our participants engaged in receptive anal intercourse, this may have occurred on several occasions with a number of different partners on whom we have no demographic information. Second, we made an assumption that participants could more explicitly and accurately recall situations in which they were the insertive partner.

To measure DCA, respondents were asked "In the past 12 months have you ever partially or fully inserted your penis (cock) into a man's anus (ass) before putting a condom on?" For the analysis a two category recoded variable (0 = no/1 = yes) was used. Sexual activities with male partners in the previous three months were determined and were categorized into a dichotomous variable describing safer sex (no unprotected insertive anal intercourse) and unsafe sex (any unprotected insertive anal intercourse).

Statistical analysis

Descriptive analyses characterized the frequency distribution of categorical variables and central tendency of continuous variables. Categorical variables were dummy coded. Univariate and multivariate polytomous logistic regressions were used to identify the variables associated with the DCA with safer or unsafe sex compared to no DCA with safer sex along

Table 1. Characteristics of the sample of men included in the analysis ($n = 2614$).

Variables	Number (%)	Mean (SD)
Socio-demographics		
Age (year)*		34.4 (10.8)
First language*		
English	2022 (77.8)	
French	216 (8.3)	
Others	361 (13.9)	
Education*		
High school or less	565 (21.7)	
College/university	1668 (64.1)	
Graduate	371 (14.2)	
Employment status (in labour force)*	2008 (77.5)	
Currently a student (yes)	522 (20.5)	
Personal income		
≤$29,999	1073 (42.3)	
$30,000–$59,999	942 (37.1)	
≥$60,000	524 (20.6)	
Ethnicity		
Caucasian	2100 (80.3)	
Others	514 (19.7)	
Registered Indian (yes)	73 (2.9)	
Country of birth*		
Canada	1869 (77.8)	
Others	535 (22.2)	
Years of living in Canada*		29.9 (13.5)
Social life		
Gay bar attendance		
<1/month	542 (21.1)	
1–3/month	702 (27.4)	
≥1/week	1321 (51.5)	
Straight bar attendance		
<1/month	1697 (66.3)	
1–3/month	478 (18.7)	
≥1/week	385 (15.0)	
Bathhouse attendance*		
<1/month	2081 (81.3)	
1–3/month	315 (12.3)	
≥1/week	163 (6.4)	
Gay dance, events or parties attendance*		
<1/month	1662 (64.8)	
1–3/month	574 (22.4)	
≥1/week	327 (12.8)	
Identity		
Gay	2194 (85.6)	
Bisexual	302 (11.8)	
Others	68 (2.6)	
Sexual Health		
Urethral gonorrhoea (ever)*	272 (10.4)	
Genital or anal warts (ever)*	263 (10.1)	
Chlamydia (ever)*	174 (6.6)	
Oral gonorrhoea (ever)*	115 (4.4)	
Syphilis (ever)	91 (3.5)	
Genital herpes (ever)	85 (3.3)	
Rectal gonorrhoea (ever)*	82 (3.1)	
Sexual activity		
Number of male sex partners in the past 12 months*		
1	339 (13.1)	
2–4	771 (30.0)	
5 or more	1464 (56.9)	
Paid money to a male for sex in the past 12 months (yes)	172 (6.7)	
Received money from a male for sex in the past 12 months (yes)	213 (8.3)	
Gave drugs, goods, clothing, protection or shelter to a male for sex in the past 12 month (yes)*	114 (4.4)	
Received drugs, goods, clothing, protection or shelter from a male for sex in the past 12 months (yes)*	154 (6.0)	
One or more sexual relationship (s) with a regular male partner in the past three months*	1684 (66.2)	
Had a casual male partner in the past three months*	1949 (75.2)	
Told each other (casual male sex partner (s) about HIV status in the past three months*		
Always	572 (27.7)	
Sometimes	619 (30.0)	
Never	872 (42.3)	
Genital modification		
Circumcised (yes)	1667 (64.4)	
Genital piercing (yes)*	80 (3.1)	
Condom use		
Condom tearing/splitting during insertive anal sex with a man in the past 12 months (yes)	362 (14.0)	
Condom slippage during receptive anal sex with a man in the past 12 months (yes)*	371 (14.4)	
DCA (yes)*	1228 (47.0)	
HIV testing		
Total number of HIV tests*		4.6 (5.1)
Self-reported HIV status*		
Positive	232 (8.9)	
Negative	1822 (70.2)	
Unknown	86 (3.3)	
Not tested	456 (17.6)	

Table 1 (*Continued*)

*$p < 0.05$ between men, who answered both questions for delayed condom application and sexual activities, and others.

Table 2. Delayed condom application (DCA) for insertive anal intercourse reported by the study sample ($n = 2614$).

	DCA (%)	PR
Overall		
Yes	1228 (47.0)	
No	1386 (53.0)	
Unsafe sex reported in the past three months*		
Yes	827 (75.7)	
No	266 (24.3)	
Only safer sex reported in the past three months		
Yes	401 (26.4)	
No	1120 (73.6)	
Paid money to a male for sex in the past 12 months*		
Yes	95 (55.2)	1.19
No	1119 (46.4)	1.00
Received money from a male for sex in the past 12 months*		
Yes	130 (61.0)	1.33
No	1084 (45.8)	1.00
Gave drugs, goods, clothing, protection or shelter to a male for sex in the past 12 months*		
Yes	75 (65.8)	1.43
No	1136 (46.1)	1.00
Received drugs, goods, clothing, protection or shelter from a male for sex in the past 12 months*		
Yes	98 (63.6)	1.38
No	1117 (46.0)	1.00
Unprotected insertive anal intercourse (UIAI)*		
Yes	1075 (64.6)	4.72
No	122 (13.7)	1.00
Unprotected receptive anal intercourse (URAI)*		
Yes	874 (60.0)	2.06
No	319 (29.1)	1.00
Self-report HIV status-positive*		
Yes	137 (59.1)	1.24
No	865 (47.5)	1.00

Note: PR, prevalence ratio.
*p-value of Chi-square test < 0.05.

with the adjusted odds ratio (AOR) and 95% confidence intervals (CIs). Variables were selected for the multivariate analysis if the p value of the univariate analysis was equal to or less than 0.1. To avoid Type 1 error, the level required for significance was set at 0.05. All analyses were performed using the SAS, Version 9.1 statistical software (2002–2003, SAS, Institute Inc., Cary, NC, USA).

Results

Characteristics of the sample

Of the 5080 men who participated in the survey, 2614 (51.5%) answered questions about DCA in the previous 12 months as well as other questions about sexual activities, and thus were included in the regression analysis (see Table 1). Among these men, 401 (17.1%) reported DCA and only safer sexual activities, 827 (35.2%) reported DCA and unsafe sexual activities, and 1120 (47.7%) reported no DCA with unsafe sexual activities. The sample was predominantly gay/bisexually identified (97.4%) although a small proportion (2.6%) identified as heterosexual or other. Compared to men who were not included in the analysis, this group was younger, included more non-English/French speakers, had higher education, and more were employed. More were born outside of Canada and had spent less time in Canada. They attended bathhouses and gay dances with greater frequency and reported a higher number of sex partners. Those with known HIV status (HIV-positive or HIV-negative) were more represented in the analysis than persons whose status was unknown or persons who had not been tested.

Drug use

More than half of the men (65.4%) reported the use of recreational drugs in the previous 12 months. The most commonly used drugs were Marijuana/Hashish (49.2%), Poppers (25.6%), Ecstasy (22.8%), Cocaine (19.9%) and Special K (15.2%). Furthermore, 150 (5.8%) reported using a needle to inject a recreational drug in their life-time.

The prevalence of delayed condom application (DCA)

Table 2 shows the prevalence and prevalence ratios of DCA for insertive anal intercourse as described earlier in this paper. The overall prevalence of DCA among 2614 men was 47.0% (95% CI = 45.1%, 48.9%). The majority (75.7%) of this occurred among those who also reported at least one episode of unprotected anal intercourse. However, 26.4% of DCA for insertive anal intercourse was among men who reported only safer sexual activities. The overall prevalence among the 3699 men answering the question of DCA for receptive anal intercourse was 44.1% (95% CI = 42.5, 45.7). The majority (66.4%) of this occurred among those who also reported at least one episode of unprotected anal intercourse.

Univariate analyses

Univariate polytomous logistic regressions examined the relationships of socio-demographic, social life, sexual health, sex activity, drug use, condom use, genital modification and HIV testing variables with DCA for men who reported safer and unsafe sexual activities as shown in Table 3.

Multivariate analyses

Multivariate polytomous logistic regressions were used to examine the associations of selected variables with DCA for insertive sex for men who reported safer or unsafe sexual activities, in relation to men who reported no insertive DCA and no unsafe sexual activities (see Table 4).

Most socio-demographic characteristics of the men were not associated with DCA with either safer or unsafe sexual activities. However, Canadian born men were more likely to report DCA with unsafe sexual activities compared to others (adjusted OR = 1.29, 95% CI = 1.03–1.62, $p = 0.0278$). An association of student status (vs. non-student status) with DCA and unsafe sexual activities was found in the univariate analysis but not in the multivariate analysis. A "gay" self-identification was most strongly associated with DCA with unsafe sexual activities (adjusted OR = 4.14, 95% CI = 1.65–10.39, $p = 0.0025$).

More frequent bar attendance at both gay and straight bars was associated with DCA but these associations were not found in the multivariate analysis. However, bathhouse attendance was associated with DCA with both safer and unsafe sexual activities (adjusted OR = 1.37, 95% CI = 1.07–1.75, $p = 0.0116$; adjusted OR = 1.15, 95% CI = 1.01–1.54, $p = 0.0466$, respectively). Most of the drug use variables dropped out in the multivariate analysis. Nevertheless, Cocaine, Poppers, and Steroids were associated with DCA with unsafe sexual activities.

Any lifetime experiences of sexually transmitted diseases, including urethal gonorrhoea, chlamydia, and genital or anal warts were associated with DCA with safer sexual activities as well as DCA with unsafe sexual activities. Similarly and somewhat related, an association was found between men who had five or more male sex partners in the previous 12 months and DCA. Men who always told casual sex partners about their HIV status, and those who had experience of condom failure (i.e. condom tearing or splitting or slippage) were more likely to report both DCA with safer sexual activities and DCA with unsafe sexual activities.

The receipt of drugs, goods, clothing, protection or shelter from a male for sex and having one or more sexual relationship(s) with a regular male partner in the previous three months were both associated with DCA and unsafe sexual activities. It should be noted that the receipt of money from a male for sex, which is more reflective of professional sex work than survival sex, was not associated with DCA with safer sexual activities or DCA with unsafe sexual activities in the multivariate analysis.

Discussion

The literature on condom use has focused mainly on consistent use of condoms during anal or vaginal intercourse. Despite a persistent elevated HIV incidence among many groups of gay and bisexual men over the past few years, and a changing epidemic, recent literature reflects little on emerging issues in condom use. Although problems with condom use are rarely assessed examination of the failure to use them is common. The current analysis permits an understanding of the prevalence of DCA among self-identified gay and bisexual men. The comparison of this practice among those who only report safer sex, with those who reported at least one episode of unprotected sex provides insight into factors associated with the delayed application of condoms.

Nearly, half of men in this study reported delayed application of condoms in the previous 12 months. While the majority of the latter group also reported episodes of unprotected anal sex, a substantial proportion only reported safer sexual practices, yet, delayed the application of condoms. This latter group may not realize that they may put themselves and their sex partners at increased risk of HIV infection. Calzavara et al. (2003) from a cohort study reported a greater prevalence of this practice among gay and bisexual men in the period before seroconversion among HIV-positive men when compared to HIV-negative controls. In this cross-sectional study we also found the prevalence of DCA to be greater among men who self-reported that they were HIV-positive than among HIV-negative individuals.

In the multivariate analysis that compared DCA among men who only practiced safer sex with those who also reported episodes of unsafe sex, most of the socio-demographic variables found in other studies to be associated with unprotected anal sex, such as age, language, education level, employment status, personal income, ethnicity were not associated. Furthermore, sexual identity (i.e. gay/bisexual) does not provide an explanation for DCA as the association with delayed application is inconsistent across men who practice only safer sex and those who report some unsafe sexual practices. Variables such as a history of STDs and number of sexual partners which were

Table 3. Univariate polytomous logistic regression ($n = 2614$).

	Delayed condom application and only safer sex reported		Delayed condom application and unsafe sex reported	
Variables	COR (95% CI)	*p*	COR (95% CI)	*p*
Socio-demographics				
Age	0.99 (0.99, 1.01)	NS	0.99 (0.99, 1.00)	NS
First language*				
French	0.83 (0.54, 1.27)	NS	0.83 (0.60, 1.15)	NS
Others	1.04 (0.75, 1.43)	NS	0.86 (0.66, 1.12)	NS
Education†				
College/university	1.13 (0.85, 1.51)	NS	1.11 (0.89, 1.39)	NS
Graduate	1.03 (0.70, 1.52)	NS	0.94 (0.69, 1.27)	NS
Current a student (no)‡	1.14 (0.86, 1.51)	NS	**1.29 (1.03, 1.62)**	**0.0278**
Employment status: in labour force (yes)§	1.24 (0.94, 1.65)	NS	1.06 (0.86, 1.31)	NS
Personal income‖				
<$29,999	0.81 (0.60, 1.11)	NS	0.88 (0.69, 1.12)	NS
$30,000–$59,999	0.86 (0.63, 1.18)	NS	0.90 (0.70, 1.15)	NS
Ethnicity (others)¶	1.05 (0.79, 1.39)	NS	0.86 (0.69, 1.08)	NS
Country of birth (Canada)**	1.03 (0.78, 1.36)	NS	**1.32 (1.05, 1.66)**	**0.0176**
Years of living in Canada	1.00 (0.99, 1.01)	NS	1.00 (1.00, 1.01)	NS
Social life				
Identity**				
Gay	1.20 (0.60, 2.38)	NS	**2.86 (1.41, 5.80)**	**0.0036**
Bisexual	1.03 (0.49, 2.19)	NS	1.84 (0.87, 3.90)	NS
Gay bar attendance	**1.23 (1.06, 1.43)**	**0.0054**	**1.21 (1.08, 1.36)**	**0.0011**
Straight bar attendance	1.03 (0.89, 1.20)	NS	**0.86 (0.76, 0.98)**	**0.0185**
Bathhouse attendance	**1.57 (1.29, 1.91)**	**<0.0001**	**1.38 (1.17, 1.63)**	**0.0001**
Gay dance, events or parties attendance	1.12 (0.95, 1.31)	NS	1.04 (0.91, 1.18)	NS
Sexual Health				
Oral gonorrhoea (ever)††	**3.04 (1.75, 5.27)**	**<0.0001**	**2.77 (1.71, 4.47)**	**<0.0001**
Rectal gonorrhoea (ever)††	**2.35 (1.25, 4.42)**	**0.0084**	**2.01 (1.16, 3.48)**	**0.0130**
Urethral gonorrhoea (ever)††	**2.15 (1.49, 3.11)**	**<0.0001**	**2.30 (1.70, 3.11)**	**<0.0001**
Chlamydia (ever)††	**3.09 (1.99, 4.78)**	**<0.0001**	**2.46 (1.67, 3.63)**	**<0.0001**
Genital or anal warts (ever)††	**2.20 (1.52, 3.19)**	**<0.0011**	**2.21 (1.63, 3.01)**	**<0.0001**
Syphilis (ever)††	1.49 (0.82, 2.60)	NS	1.05 (0.63, 1.74)	NS
Genital herpes (ever)††	1.68 (0.90, 3.16)	NS	**1.79 (1.07, 2.98)**	**0.0255**
Sexual activity				
Total number of male sex partners in the past 12 months‡‡				
2–4	1.23 (0.82, 1.84)	NS	0.92 (0.68, 1.26)	NS
5 or more	**1.86 (1.27, 2.72)**	**0.0014**	**1.81 (1.36, 2.40)**	**<0.0001**
Paid money to a male for sex (yes)§	1.31 (0.83, 2.07)	NS	**1.45 (1.01, 2.07)**	**0.0432**
Received money from a male for sex in the past 12 months (yes)§	**1.84 (1.23, 2.75)**	**0.0032**	**1.86 (1.34, 2.59)**	**0.0002**
Gave drugs, goods, clothing, protection or shelter to a male for sex in the past 12 months (yes)§	**2.03 (1.15, 3.58)**	**0.0152**	**2.53 (1.60, 3.99)**	**<0.0001**
Received drugs, goods, clothing, protection or shelter from a male for sex in the past 12 months (yes)§	**1.95 (1.18, 3.22)**	**0.0092**	**2.52 (1.69, 3.75)**	**<0.0001**
One or more sexual relationship (s) with a regular male partner in the past three months (yes)§	0.95 (0.75, 1.20)	NS	**2.57 (2.09, 3.15)**	**<0.0001**
Told male casual sex partner (s) each other about HIV status in the past three months††				
Always	**1.43 (1.05, 1.96)**	**0.0249**	**1.45 (1.13, 1.86)**	**0.0039**
Sometimes	**1.57 (1.16, 2.12)**	**0.0035**	**1.62 (1.28, 2.07)**	**<0.0001**

Table 3 (*Continued*)

Variables	Delayed condom application and only safer sex reported		Delayed condom application and unsafe sex reported	
	COR (95% CI)	*p*	COR (95% CI)	*p*
Drug use				
Marijuana/hash (yes)§	1.21 (0.97, 1.52)	0.0987	**1.55 (1.29, 1.86)**	**<0.0001**
Cocaine (yes)§	**1.61 (1.20, 2.17)**	**0.0015**	**2.30 (1.83, 2.88)**	**<0.0001**
Crack Cocaine (yes)§	1.42 (0.78, 2.56)	NS	**2.01 (1.29, 3.15)**	**0.0022**
Heroin (yes)§	1.24 (0.38, 4.06)	NS	1.21 (0.46, 3.14)	NS
Speed Ball (yes)§	1.77 (0.79, 3.92)	NS	**1.97 (1.04, 3.76)**	**0.0387**
Opiates (yes)§	1.34 (0.63, 2.87)	NS	1.03 (0.54, 1.99)	NS
Psychedelics (yes)§	1.06 (0.57, 1.98)	NS	**1.68 (1.08, 2.63)**	**0.0215**
Amphetamines/Speed (yes)§	1.36 (0.85, 2.22)	NS	**2.09 (1.46, 2.98)**	**<0.0001**
Barbiturates (yes)§	1.98 (0.75, 5.22)	NS	**2.47 (1.13, 5.38)**	**0.0229**
Special K (yes)§	**1.68 (1.21, 2.33)**	**0.0022**	**2.35 (1.82, 3.04)**	**<0.0001**
GHB (yes)§	**1.88 (1.15, 3.07)**	**0.0116**	**2.68 (1.83, 3.93)**	**<0.0001**
Tranquilizers (yes)§	1.22 (0.73, 2.04)	NS	**1.91 (1.31, 2.77)**	**0.0007**
Solvents (yes)§	2.81 (0.56, 13.96)	NS	1.81 (0.40, 8.11)	NS
Poppers (yes)§	**1.72 (1.32, 2.24)**	**<0.0001**	**2.28 (1.85, 2.81)**	**<0.0001**
Ecstasy (yes)§	**1.53 (1.16, 2.02)**	**0.0024**	**2.07 (1.67, 2.57)**	**<0.0001**
Steroids (yes)§	**3.09 (1.40, 6.84)**	**0.0053**	**2.88 (1.44, 5.76)**	**0.0028**
Viagra (yes)§	**1.78 (1.19, 2.64)**	**0.0047**	**2.44 (1.79, 3.32)**	**<0.0001**
Used a needle to inject a recreational drug (ever)††	**2.24 (1.46, 3.44)**	**0.0002**	1.15 (0.77, 1.74)	NS
Genital modification				
Circumcised (yes)§	1.20 (0.95, 1.53)	NS	**1.24 (1.03, 1.50)**	**0.0237**
Genital piercing (yes)§	**2.34 (1.22, 4.49)**	**0.0103**	**1.96 (1.11, 3.45)**	**0.0195**
Condom use				
Condom tearing or splitting during insertive anal sex with a man in the past 12 months (yes)§	**2.93 (2.11, 4.08)**	**<0.0001**	**2.99 (2.27, 3.94)**	**<0.0001**
Condom slippage during receptive anal sex with a man in the past 12 months (yes)§	**2.99 (2.19, 4.10)**	**<0.0001**	**2.47 (1.88, 3.23)**	**<0.0001**
Condom too short (yes)§	**2.17 (1.35, 3.48)**	**0.0013**	**2.10 (1.41, 3.13)**	**0.0003**
Condom too long (yes)§	1.41 (0.74, 2.71)	NS	1.42 (0.84, 2.40)	NS
Condom too tight (yes)§	**1.59 (1.11, 2.27)**	**0.0108**	**2.16 (1.64, 2.85)**	**<0.0001**
Condom too loose (yes)§	1.14 (0.56, 2.33)	NS	**2.22 (1.36, 3.62)**	**0.0014**
HIV testing				
Total number of HIV test	**1.05 (1.02, 1.07)**	**0.0005**	**1.04 (1.02, 1.07)**	**0.0001**
Self reported HIV infection status||||				
Positive	**2.36 (1.43, 3.90)**	**0.0008**	**2.35 (1.62, 3.40)**	**<0.0001**
Negative	**1.74 (1.24, 2.44)**	**0.0013**	**1.29 (1.01, 1.63)**	**0.0404**
Unknown	**2.79 (1.54, 5.05)**	**0.0007**	0.56 (0.29, 1.08)	0.0830

Note: COR, crude odds ratio; CI, confidence interval.
NS = $p > 0.1$.
*English; †high school or less; ‡yes; §no; ||$60,000 or more; ¶Caucasian; **others; ††never; ‡‡1; ||||not tested.

associated with delayed application within both groups of men are reflective of features we know about risk taking, but give us few clues about potential reasons for delaying the application of condoms.

To provide greater understanding, we paid particular attention to variables that are recorded in the literature as being related to reasons for not using condoms (Crosby, Graham, Yarber, & Sanders, 2004; Piaseczna et al., 2000; Suarez & Miller, 2001). It should be noted that the available data did not permit an examination of all such reasons. Use of recreational drugs is one of the most prominent explanations given in the literature for not using condoms. In this sample, 65.4% of men reported recreational drug use in the previous 12 months. The recreational drugs, specifically cocaine, poppers and steroids

Table 4. Multivariate polytomous logistic regression ($n = 2614$).

	Delayed condom application and only safer sex reported		Delayed condom application and unsafe sex reported	
Variables	AOR (95% CI)	***p***	AOR (95% CI)	*p*
Socio-demographics				
Country of birth (Canada)*	1.21 (0.85, 1.73)	0.2842	**1.41 (1.04, 1.90)**	**0.0265**
Social life				
Identity*				
Gay	1.34 (0.59, 3.04)	0.4857	**4.14 (1.65, 10.39)**	**0.0025**
Bisexual	1.31 (0.53, 3.21)	0.5566	**2.90 (1.09, 7.72)**	**0.0328**
Bathhouse attendance	**1.37 (1.07, 1.75)**	**0.0116**	**1.15 (1.01, 1.54)**	**0.0466**
Sexual Health				
Urethral gonorrhoea (ever)†	**1.66 (1.05, 2.65)**	**0.0321**	**1.65 (1.11, 2.45)**	**0.0137**
Chlamydia (ever)†	**2.19 (1.28, 3.75)**	**0.0044**	**1.66 (1.02, 2.70)**	**0.0430**
Genital or anal warts (ever) †	**1.86 (1.17, 2.96)**	**0.0085**	**1.79 (1.21, 2.65)**	**0.0037**
Sexual activity				
Total number of male sex partners in the past 12 months ‡				
2–4	1.31 (0.68, 2.49)	0.4207	1.21 (0.69, 2.11)	0.5092
5 or more	**1.96 (1.06, 3.63)**	**0.0330**	**2.05 (1.20, 3.48)**	**0.0082**
Received drugs, goods, clothing, protection or shelter from a male for sex in the past 12 months (yes)§	1.41 (0.71, 2.80)	0.3317	**2.06 (1.18, 3.60)**	**0.0110**
One or more sexual relationship (s) with a regular male partner in the past three months (yes)§	0.78 (0.58, 1.05)	0.0956	**2.45 (1.90, 3.17)**	**<0.0001**
Told male causal sex partner (s) each other about HIV status in the past three months†				
Always	**1.56 (1.09, 2.23)**	**0.0156**	**1.55 (1.15, 2.08)**	**0.0038**
Sometimes	1.26 (0.89, 1.79)	0.1913	1.15 (0.86, 1.54)	0.3383
Drug use				
Cocaine (yes)§	1.04 (0.70, 1.54)	0.8398	**1.59 (1.16, 2.18)**	**0.0036**
Poppers (yes)§	1.12 (0.79, 1.60)	0.5150	**1.49 (1.12, 1.98)**	**0.0056**
Steroids (yes)§	2.55 (0.83, 7.83)	0.1026	**3.29 (1.22, 8.93)**	**0.0191**
Condom use				
Condom tearing or splitting during insertive anal sex with a man in the past 12 months (yes)§	**2.18 (1.40, 3.37)**	**0.0005**	**2.16 (1.47, 3.17)**	**<0.0001**
Condom slippage during receptive anal sex with a man in the past 12 months (yes)§	**2.14 (1.42, 3.22)**	**0.0003**	**1.62 (1.13, 2.34)**	**0.0090**

Note: AOR, adjusted odds ratio.
R-Square = 0.1931, Max-rescaled R-Square = 0.2216.
*Others; †never; ‡1; §no.

were not associated with DCA among those who reported only safer sexual activities and therefore do not provide us with a clear reason for delayed application.

Physical discomfort and decreased sexual pleasure have been reported as a reason for the lack of condom use (Rosenberg, 1997). In this analysis, variables such as condoms which were too short or long too tight or loose, which may reflect physical discomfort were not related to delayed application. However, other condom use experiences such as condom tearing, splitting or slippage during intercourse were associated with DCA in both groups. Understandably, it would be expected that non-condom use would be associated with bad or unpleasant experiences. While community-level education may be helpful in changing attitudes, and to improve condom use practices, improved condom technology is also important (Golombok, et al, 2001).

The delayed application of condoms may not simply be a spontaneous occurrence. The associations found with discussion or disclosure of serostatus

suggest that there may be some process of negotiation or agreement occurring in encounters where condom use is delayed. Serostatus disclosure and perceptions of risks among men and the influence of this on DCA need to be studied further.

Several limitations should be taken into consideration when interpreting the results of this analysis. First, the analysis examined the occurrence of delayed application – which could be either a single or multiple occurrences in one or more sexual encounters. More precise measurement within a sexual event is required. Considering the limitation mentioned in our justification for focusing on DCA for insertive anal intercourse, we also conducted an analysis of delayed application for receptive anal intercourse, and found that similar groups of variables entered the model. This would seem to support findings that many men may not be only insertive or receptive sexually but are versatile. In our study, among men who had anal intercourse, 50.3% participated in both insertive and receptive anal intercourse in the past three months. The cross-sectional nature of the data and the limited detail on the context of specific sexual events prevents a full causal inference and a complete understanding of DCA. Future research should include consistent time periods, questions with greater detail on sexual behaviors, attitudes and knowledge, decision making, and the processes of condom application. In addition, longitudinal studies are important to compare across different contexts and specific sexual episodes. As the study was anonymous it is thought that the potential for self-report bias of behaviors must be considered. In view of the high proportion reporting DCA, regardless of whether sexual behaviors were safer or unsafe, suggests that men felt free to disclose this behavior.

Clearly, effective condom use remains a priority for MSM communities, educators, public health promoters and policy makers. Risks associated with DCA need to be clarified and this information more widely disseminated. The challenge for the educator or health promoter is to continue to keep the interest in condoms on the map despite condom fatigue and biomedical promises that may detract from the importance of condoms. Condom use is complex and in the context of HIV/AIDS, must be considered a harm reduction practice (Van de Ven et al., 2004). DCA, which may be considered by men as an effective harm reduction strategy requires reconsideration. Interventions to address this behavior need to consider the physical issues of condom use along with the complex array of social, structural, psychological, and interpersonal issues.

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