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Correlates of Risky Behaviors Among Young and Older Men Having Sexual Relations With Men in Montréal, Québec, Canada

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Objective: To assess characteristics associated with 1) age and 2) recent unprotected anal sex with casual partners among men having sexual relations with men (MSM) participating in the Omega Cohort, Montréal, Québec, Canada.

Methods: The Omega Cohort is a study of the incidence and psychosocial determinants of HIV infection among MSM living in Montréal. MSM complete a questionnaire and are tested for HIV every 6 months.

Results: Thirteen percent of young MSM (<30 years of age, $n = 355$) and 12% of older MSM (≥30 years of age, $n = 455$) reported recent unprotected anal sex with casual partners. The predictors of this latter behavior were: not living with a male sexual partner, unprotected anal sex with regular partner, >5 casual partners, alcohol/drug use before anal sex, and having difficulties with procedures needed for safe sex. Among young MSM, additional predictors were: to have been living in Montréal for less than 1 year and to have exchanged money for sex. Among older MSM, additional predictors were: female sexual partners, unprotected anal sex with an HIV-infected partner, and feeling invulnerable to AIDS.

Conclusion: Young Omega participants do not have more risky behaviors than older participants. Some predictors of recent risk behaviors with casual partners were different between the two groups. Prevention programs should be adapted consequently.

Key Words: MSM—Risk behaviors—Unprotected anal sex—HIV

In the early 1980s, several cohort studies have assessed HIV incidence and associated factors among men having sexual relations with men (MSM) (1–3). However, given that most men in these studies were recruited more than 10 years ago, we have limited information on younger MSM. To resolve this problem and also because cross-sectional studies have documented high levels of risky behaviors among young MSM (4–7), several cohort studies recruiting young MSM were implemented at the beginning of the 1990s (8–12).

In the United States, cohort studies among young MSM have observed an HIV prevalence of 18% and 9% in San Francisco (8,9), 9% in New York City (HIV incidence was 2/100 person-years [p-y]) (10), and 2% in Boston (12). According to the Vanguard Project implemented in Vancouver, British Columbia, Canada in 1995 (11), HIV incidence was 2/100 p-y at the end of 1997.

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Moreover, 4% of young MSM from a cohort study in Amsterdam in the Netherlands were HIV positive at entry in the study in 1996 (13).

In the province of Québec, Canada, little is known about the HIV epidemic among MSM. The only specific study among MSM in Montréal was carried out in 1989 (14). The Omega cohort was implemented in 1996 to assess HIV incidence and associated determinants among Montréal's MSM.

The objectives of this study were to assess risk behaviors associated with age (<30 versus ≥30 years old) among MSM participating in the Omega Cohort in Montréal and to assess demographic, sexual, and psychosocial factors associated with the practice of unprotected anal sex with casual partners during the previous 6 months.

METHODS

Background

The Omega Cohort project is an ongoing prospective study of HIV incidence and associated determinants among MSM living in the Montréal metropolitan area. Recruitment started in October 1996 and was carried out through the following strategies: a bilingual publicity campaign in print general and gay media; collaboration with gay community organizations and medical clinics where the study was discussed with eligible men; individual contacts with eligible men during gay pride events; and use of posters and leaflets placed at strategic sites in gay venues and clinics. The study population consists of MSM aged 16 years and older who have had sex with another man at least once in the preceding year and are HIV negative or do not know their serostatus at baseline. Interviews are mainly carried out at a community organization called Centre des Gais et Lesbiennes de Montréal (Montréal Gay and Lesbian Center) but also at one of three private medical clinics and a community health clinic.

Data Collection

At the first interview, after informed written consent, participants complete the questionnaire and blood is collected t test for HIV, hepatitis B, and syphilis. Three weeks after the first appointment, participants return to receive their test results and posttest counseling. Participants who test positive fr HIV are excluded from the study and referred to appropriate services. Participants return every 6 months to complete a follow-up questionnaire and to be retested for HIV and syphilis.

Statistical Analyses

The prevalence odds ratio (POR) was used as the measure of association. In addition, χ^2 for trend and Fisher's exact test were used for categoric variables and the Mann-Whitney U-test for continuous variables. We performed logistic regression analysis to identify variables independently associated with age and with the practice of unprotected anal sex with casual partners. We calculated an adjusted R with 95% likelihood ratio–based confidence intervals (CI) for variables that remained in the final models. All analyses were performed using SAS, version 6.12 (SAS Institute, Cary, NC, U.S.A.).

Dependent Variables

The age-based dichotmization at 30 years is interesting because it creates two separate groups according to the pre- and post-AIDS periods. The MSM <30 years old began their sexual life, generally, after AIDS had become a major health problem. MSM or 30 years or older began their sexual life before AIDS and were obliged to adjust their sexual lifestyle to this new reality. However, the analyses were also performed using age as a continuous variable and a similar final regression model such as when using the two age groups was obtained.

In this study, a casual partner was defined as someone with whom the participant had sex only once (a "one-night stand"), someone he did not intend to see again; if he had a subsequent sexual encounter with him, it was by chance. The variable "unprotected anal sex with casual partners" had a value of zero when the participant avoided unprotected anal sex with casual partners, avoided anal sex, or did not report any casual partner. It had a value of one when condoms were not used systematically during anal sex with casual partners. The analyses were also performed using only MSM who avoided unprotected anal sex with casual partners as the comparison group and essentially the same final logistic regression model was obtained. Moreover, because the predictors of unprotected receptive and insertive anal sex were similar, these two sexual behaviors were considered together in the analyses.

Psychosocial Variables

Psychosocial variables were developed using several different models such as the AIDS Risk Reduction Model (15), the Protection Motivation Theory (16), and the Theory of Planned Behavior (17,18).

Health concerns: Participants responded to statements related to some health concerns using a 5-point Likert scale (1 = not at all–5 = very often). After factor analysis was performed, four different factors measuring health concerns were constructed: "surrounding oneself with friends," "taking care of one's health," "find ways to reduce stress," and "healthy living habits."

Social concerns: Participants responded to statements related to some social concerns using a 5-point Likert scale (1 = not at all–5 = a lot). Four factors were constructed: "loneliness"; "job, study and money problems, concerns about future and difficulty finding support when necessary"; "heavy responsibilities"; and "difficulties in accepting one's sexual orientation". For each factor, a low score corresponds to a high social concern whereas a high score corresponds to a low social concern.

Attitudes toward AIDS: Participants responded to statements related to their attitudes toward AIDS using a 5-point Likert scale (1 = never–5 = very often). Five factors were constructed: "anxiety toward AIDS"; "feeling invulnerable to AIDS"; "avoiding thinking about AIDS"; "taking AIDS as a banality" and "underestimation of the importance of the AIDS epidemic".

Attitudes toward condom use during anal sex: Participants responded to statements related to their attitudes toward condom use during anal sex using a 5-point Likert scale (1 = not at all–5 = very much). Three factors were constructed: "sense of security," "feeling of trust between partners," and "interference with eroticism." For each factor, a low score corresponds to a negative attitude toward condom use whereas a high score corresponds to a positive attitude toward condom use.

Perceived behavioral control toward condom use during anal sex: Participants responded to statements related to their perceived behavioral control toward condom use during anal sex using a 5-point Likert scale (1 = not difficult at all–5 = very difficult). Five factors were constructed: "difficulties in handling safe sexual encounter"; "difficulties in getting condoms"; "difficulties in using a condom when very

aroused sexually or the partner appeared safe"; "difficulties in using a condom when they did not want to disappoint the partner or were afraid of him"; and "difficulties in using a condom when they were under the influence of alcohol/drugs". For each factor, a low score corresponds to a high perceived behavioral control toward condom use during anal sex whereas a high score corresponds to a low perceived behavioral control toward condom use.

RESULTS

Sociodemographic Characteristics

As of the end of 1997, 810 MSM with a mean age of 33 years (median = 32; range 16–73) completed their baseline interview in the Omega Cohort. Most (79%) were born in the province of Québec, were living on the island of Montréal (90%), were single (74%) and well educated (44% attended college). Half the participants reported a yearly income of less than $CDN 20,000 (mean of $CDN 24,000 compared with $CDN 30,000 among the general population of men in Montréal, according to census data [19]), 45% worked full-time at the time of interview, 20% studied full time, and 17% received welfare or unemployment insurance benefits.

Risky Behaviors Associated With Age

In the univariate analysis comparing young MSM (<30 years, $n = 355$) with older MSM (≥30 years, $n = 455$) with regard to risk behaviors, fewer young MSM reported sex in bathhouses (34% versus 52%; $p \leq .001$) and having had more than 5 casual partners during the previous 6 months (30% versus 44%; $p \leq .001$) whereas a greater proportion reported anal sex with their regular partners during the same period (68% versus 54%; $p \leq .001$). There was no statistically significant difference between young MSM and older MSM with regard to other sexual behaviors. Table 1 presents data on safe sex separately by type of partner, type of anal sex, and age group.

Among MSM who reported only one casual partner, 5% ($n = 2$ of 37) of young MSM and 4% ($n = 2$ of 46) of older MSM reported unprotected anal sex during the previous 6 months ($p = 1.00$). Among MSM who reported between 2 and 5 casual partners, these proportions were 10% ($n = 11$ of 111) and 6% ($n = 7$ of 113), respectively ($p = .34$). Among MSM who reported between 6 and 19 casual partners, these proportions were 28% ($n = 19$ of 69) and 21% ($n = 22$ of 104), respectively ($p = 0.37$) whereas for >19 casual partners, it was 40% ($n = 14$ of 35) and 24% ($n = 22$ of 90), respectively ($p = .12$). The proportion of MSM who reported unprotected anal sex increased as the number of casual partners increased ($p = .036$, χ^2 for trend). Table 2 shows the variables that remained associated with age in the multivariate analysis.

Factors Associated With the Practice of Unprotected Anal Sex With Casual Partners During the Previous 6 Months

Overall, 46 (13%) MSM <30 years of age reported unprotected anal sex with casual partners during the previous 6 months whereas 54 of those aged 30 years or more did so (12%). In a logistic regression analysis including the two age groups and in which the interactions with age were tested systematically (Table 3), variables that remained associated with the practice of unprotected anal sex with casual partners among 810 Omega participants were: not living with a male sexual partner, had unprotected anal sex with regular partners during one's

TABLE 1. *Safe sex in the previous 6 months among 810 men who have sex with men (MSM) participating in the Omega Cohort*

Condom use (% of intercourses)	0%	>0%, <50%	≥50%, <100%	100%[a]	Total	*p* Value[b]
Young MSM (<30 years)						
Regular partners, insertive sex	31 (9%)	22 (6%)	42 (12%)	257 (73%)	352[c]	
Regular partners, receptive sex	36 (10%)	17 (5%)	40 (11%)	259 (74%)	352[c]	
Casual partners, insertive sex	6 (2%)	8 (2%)	22 (6%)	312 (90%)	248[c]	
Casual partners, receptive sex	4 (1%)	5 (1%)	14 (4%)	325 (93%)	348[c]	
Older MSM (≥30 years)						
Regular partners, insertive sex	63 (14%)	11 (2%)	40 (9%)	330 (74%)	444[d]	0.99
Regular partners, receptive sex	54 (12%)	6 (1%)	38 (9%)	346 (78%)	444[d]	0.23
Casual partners, insertive sex	7 (2%)	8 (2%)	33 (7%)	398 (89%)	446[d]	0.90
Casual partners, receptive sex	5 (1%)	3 (1%)	24 (5%)	414 (93%)	446[d]	0.79

[a] Includes MSM who avoided anal sex or did not have sexual partners during the previous six months.
[b] Mann Whitney U-test comparing safe sex between young and older MSM, for each type of sexual partners (regular or casual) and each type of anal sex (insertive or receptive).
[c] Numbers do not total 355 because of missing values.
[d] Numbers do not total 455 because of missing values.

TABLE 2. *Prevalence odds ratio (POR) and 95% confidence interval (CI) of variables associated with young age (<30 years) among 810 men who have sex with men (MSM) participating in the Omega Cohort*

Variables	<30 years (n = 355) prevalence (%)	≥30 years (n = 455) prevalence (%)	Adjusted POR[a]	Adjusted 95% CI[a]	*p* Value[a]
Positively associated with:					
Anal sex with regular partners in previous 6 months	68	54	1.9	1.4–2.6	.001
Negatively associated with:					
Sex in bathhouses in previous 6 months	34	52	0.5	0.4–0.7	.001
>5 Casual partners in previous 6 months	30	44	0.7	0.5–1.0	.044

* Adjusted for other variables listed in the table.

lifetime, had >5 casual partners during the previous 6 months, used alcohol or drugs before anal sex with casual partners, and had lower perceived behavioral control with regard to one's capacity to handle safe sexual encounter. Among young MSM, additional variables associated with the practice of unprotected anal sex with casual partners were: not being a practicing Roman Catholic, to have been living in Montréal for ≤1 year, and to have ever given money for sex. Among older MSM, additional variables associated with the practice of unprotected anal sex with casual partners were: unprotected anal sex with regular partners during the previous 6 months, sex with female partners during the previous year, unprotected anal sex with an HIV-infected partner during one's lifetime, and feeling invulnerable to AIDS.

It is interesting to note that the other variables related to perceived behavioral control toward condom use during anal sex (in men of all ages, difficulties in using a condom: "when very aroused sexually or the partner appeared safe," "when they did not want to disappoint the partner or were afraid of him," "when they were under

TABLE 3. *Prevalence odds ratio (POR) and 95% confidence interval (CI) of variables associated (with multivariate analysis) with the practice of unprotected anal sex with casual partners during the previous six months among 810 men who have sex with men (MSM) participating in the Omega Cohort*

Variables	Young MSM POR [95% CI][a]	Older MSM POR [95% CI][a]	Overall POR [95% CI][a]
Sociodemographic characteristics			
Not practicing Catholicism	5.6 [1.7–23.8]	0.9 [0.3–2.7]	NA
Living in Montreal for ≤1 year	4.4 [1.7–11.5]	2.9 [0.6–12.5]	NA
Single (not living with a male sexual partner)	6.4 [1.5–37.0]	8.3 [1.6–83.3]	7.1 [2.3–27.0]
Lifetime behaviours			
Unprotected anal sex with regular partners	4.6 [1.6–13.5]	7.6 [1.9–43.2]	5.4 [2.4–13.2]
Ever have given money for sex	4.8 [1.1–20.3]	1.3 [0.5–3.3]	NA
Lifetime behaviours			
Female partners in previous year	0.7 [0.2–2.9]	5.3 [1.3–21.9]	NA
Unprotected anal sex with HIV-positive partners	2.7 [0.6–11.3]	3.3 [1.1–9.6]	NA
Previous 6 months behaviors			
Unprotected anal sex with regular partners	0.7 [0.3–1.8]	5.5 [2.4–13.7]	NA
>5 Casual partners	10.4 [4.2–28.0]	11.6 [4.3–36.3]	10.9 [5.5–23.1]
Frequent alcohol/drug use before anal sex casual partners	2.9 [1.0–8.4]	3.5 [1.3–10.0]	3.2 [1.5–6.7]
Psychosocial factors			
Difficulties in handling safe sexual encounter (scale: 9 to 45)	1.1 [1.0–1.2]	1.1 [1.0–1.3]	1.1 [1.1–1.3]
Feeling invulnerable to AIDS (scale: 3 to 15)	1.1 [0.8–1.5]	1.3 [1.1–1.6]	NA

[a] Adjusted for other variables listed in the table.
NA, not applicable because there is a significant interaction between the variable and age.

the influence of alcohol/drugs"; in younger men: "difficulties in getting condoms") were associated to unprotected anal sex with casual partners in the univariate analysis (data not shown). However, they were not significant in the multivariate model because they were highly linked together and with the variable "difficulties in handling safe sexual encounter." In addition, among men aged <30 years, very young age was associated with risky behaviors. Indeed, among a small group of 32 men aged <20 years, 8 (25%) reported the practice of unprotected anal sex with casual partners compared with 12% (38 of 316) among those aged 20 to 29 ($p = .05$, Fisher's exact test).

DISCUSSION

Overall, risk behaviors of Omega participants during the previous 6 months did not differ according to age. This is somewhat surprising because most North American studies have reported that risk behaviors such as unprotected anal sex were associated with younger age (4–6,13,20–23).

MSM who were living with a male sexual partner at the time of interview were less likely to have had unprotected anal sex with casual partners. Some of these MSM may be monogamous or may have decided not to have risky sex outside their couple relationship to avoid condom use with their regular partner. Many Omega participants reported that they and their regular partners are getting tested for HIV before stopping condom use. However, it has been reported that some MSM who are practicing unprotected anal sex only with their regular partners have serial or concomitant regular partners (22) and/or do not know their own serostatus or that of their regular partner (24).

MSM who had ever had unprotected anal sex with regular partners were much more likely to report unprotected anal sex with casual partners than MSM who avoided this behavior. Many previous studies have found such an association between past risk behaviors and present risk behaviors and with relapse of risk behaviors (20–22,25). However, by targeting only MSM who report current unsafe behaviors, we may miss many men at risk for future unsafe sex (22). Organizations involved in HIV prevention should target MSM at the beginning of their sexual lives, that is, before they acquire risky habits. Prevention strategies should be implemented in schools, particularly those located outside downtown Montréal, to increase the awareness of youth about safe sex guidelines as early as possible.

As reported elsewhere (26), MSM who reported unprotected anal sex with casual partners also reported more casual partners than MSM who avoided such risk behaviors. This may be explained by the fact that MSM who prefer risky practices also seek many partners (20) or because as the number of episodes of sex increases, the likelihood of having unprotected sex also increases.

As reported elsewhere (4,5,20,25), frequent alcohol or drug use before anal sex with casual partners (to be under the influence of alcohol or drugs during half or more of anal intercourse) was strongly predictive of unprotected anal sex. Whether this association between alcohol or drug intake is causal, this behavior could be used as a marker for high-risk sexual activity to target MSM who are more likely to practice unprotected anal sex (9,27). Prevention strategies should be reinforced in locations where alcohol is sold, such as bars, clubs, and other public venues. The link between alcohol use and unsafe sex should also be made more explicitly in prevention messages.

MSM who reported risky sex with casual partners also reported more frequent difficulties in using safe sex. This is related to a low perceived behavioral control toward condom use. These MSM may feel emotional discomfort using condoms, communicating openly about sex or be less confident about the negotiation of safe sex (7,9,28). Prevention strategies should aim to help MSM in Montréal to improve the communication skills necessary for the negotiation of safe sex.

Among young MSM, having lived in Montréal for 1 year or less was a determinant of unprotected anal sex with casual partners. MSM who just arrived in Montréal may be less aware of the prevention messages. Some of these young men may be willing to have new sexual experiences without regard to the risks of HIV infection. This situation is also reflected by the fact that very young MSM (<20 years) also reported more risky behaviors. Organizations involved in HIV prevention should increase prevention messages targeting young MSM living outside urban centers, such as in suburbs where there are fewer resources for MSM. Peer counselling strategies, such as Montréal's "Project 10," should be implemented in bars or in schools where a gay leader who endorses and recommends safe sex could serve as a role model and offers support to young MSM (27,29–31).

Young MSM who had paid for sex were also more likely to have had unprotected anal sex with casual partners than MSM who avoided this behavior. These men may represent a group of MSM who take risks in general and thus are willing to have unprotected anal sex with anonymous partners.

Among older men, unprotected anal sex with casual partners was also associated with unprotected anal sex with an HIV-positive partner. These MSM may take risks in general or feel somewhat invulnerable to HIV

because they did not become infected in spite of previous behaviors. This is supported by the fact that feeling invulnerable to AIDS was also a predictor of unprotected anal sex with casual partners among older Omega participants. These men may also incorrectly underestimate their personal vulnerability to AIDS (21). Some MSM could correctly identify practices risky for HIV transmission but are unable to interpret the implications of their own risky sexual behaviors (27). It could be an indication that these MSM have not reached the first step required for the adoption of safe sexual practices, which is the recognition of one's sexual behaviors as being at risk (15). Among Omega participants, at risk MSM perceived wrongly their sexual activities as relatively safe.

Among older men, to have had sex with a woman during the previous year was a predictor of unprotected anal sex with casual partners. Some of these men may have just have begun homosexual activity and have poor safe sex negotiation skills, fewer social norms, or less support for safe sex (21). According to Fisher (32), "the more comfortable gay men are with being gay, the greater their involvement with gay social networks in which AIDS-preventive behaviors and their practice of safe sex." Some MSM may also be bisexual and thus place their female partners at risk of HIV infection.

Omega participants may not be representative of the gay community of Montréal because participation was voluntary and we did not attempt to recruit a random sample of Montréal's MSM. However, because we used multiple recruitment strategies, the participants are diversified. Despite this limitation, our results give several insights for public health authorities to better target at risk MSM.

In summary, 13% of young MSM and 12% of older MSM reported unprotected anal sex with casual partners. Some variables that predict the practice of unprotected anal sex with casual partners such as unprotected anal sex with regular partners, a high number of casual partners, frequent alcohol/drug use before sex, and having difficulties in handling safe sexual encounters are similar between the two age groups. However, two different patterns of at risk MSM emerge according to age groups. Among young MSM, being <20 years old, to have been living in Montréal for ≤1 year, and to ever have exchanged money for sex are predictors of risk behaviors. Among older MSM, bisexual practices, unprotected anal sex with an HIV-infected partner, and feeling invulnerable to AIDS are specific predictors. Montréal organizations implicated in HIV prevention should use these results to better target MSM who place themselves at risk of HIV infection.

APPENDIX

The Omega Study Group is composed of Michel Bouchard, Michel Châteauvert, André Desmarais, Frédéric Doutrelepont, Micheline Dupuis, Yves Jalbert, Pierre Junod, Ralf Jürgens, Roger Leblanc, Éric Lefebvre, René Légaré, Catherine Lowndes, Eva Nonn, Sylvie Savard, Robert Steinman, Réjean Thomas, and Anne Vassal.

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ERRATUM

In retrospect, we believe that Stefania Paolucci and Fausto Baldanti, Servizio id Virologia, IRCCS Policlinico San Matteo, Pavia, Italy, should be listed as coauthors of the paper entitled "Efavirenz, Nelfiniavir, and Stavudine Rescue Combination Therapy in HIV-1–Positive Patients Heavily Pretreated With Nucleoside Analogues and Protease Inhibitors," published in the December 15, 1999 issue (volume 22, issue 5, pages 453–460). By developing a new sequencing assay and using samples which were stored in their laboratory, they made possible the drug resistance analysis described in the article. In addition, they performed this analysis using their own research grants (IRCCS Policlinico San Matteo, Ricerca Corrente 1998, and Ministero della Sanitá, Istituto Superiore di Sanitá, Il Programma Nazionale AIDS, contract no. 30B.33). Thus, we ask that the article's authorship now be listed as: Elena Seminar, Franco Maggiolo, Paola Villani, Fredy Suter, Angelo Pan, Mario B. Regazzi, Stefania Paolucci, Fausto Baldanti, Carmine Tinelli, and Renato Maserati.

Sincerely,
Renato Maserati