Risk Behaviours and HIV Infection Among Men Having Sexual Relations with Men: Baseline Characteristics of Participants in the Omega Cohort Study, Montreal, Quebec, Canada

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ABSTRACT

Objective: To describe characteristics of men having sex with men (MSM) participating in the Omega Cohort, to describe HIV-positive participants at baseline interview, and to estimate HIV incidence.

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

Results: During the previous six months, 31% and 12% of 810 participants (mean age=33 years) reported unprotected anal sex with regular and casual partners, respectively. Eight participants (0.98%) were HIV-infected at baseline. HIV incidence was 0.89 per 100 person-years (7/787 person-years) [95% confidence interval: 0.36-1.83].

Conclusion: A significant proportion of participants reported current risk behaviours. Despite this, HIV incidence is relatively low. It is important to target MSM who do not practice safe sex and to encourage those practicing safe sex to sustain these behaviours.

ABRÉGÉ

Objectif : Décrire les caractéristiques des hommes ayant des relations sexuelles avec d'autres hommes (HRSH) participant à la Cohorte Omega, caractériser les participants séropositifs à l'entrée dans l'étude, et estimer l'incidence du VIH sur des données préliminaires.

Méthode : La Cohorte Omega porte sur l'incidence et les déterminants psychosociaux de l'infection par le VIH chez les HRSH habitant Montréal. Les participants complètent un questionnaire et sont testés pour le VIH à tous les six mois.

Résultats : Lors des six derniers mois, 31 % et 12 % des 810 participants (âge moyen=33 ans) ont eu des relations anales non protégées avec des partenaires réguliers et occasionnels, respectivement. Huit participants (0,98 %) étaient infectés par le VIH à l'entrée dans l'étude. L'incidence du VIH était de 0,89 par 100 personne-années (7/787 personne-années) [intervalle de confiance à 95 % : 0,36-1,83].

Conclusion : Certains participants de la Cohorte Omega ont couramment des comportements à risque d'infection par le VIH. Malgré cette observation, l'incidence du VIH est relativement peu élevée. Il est primordial de cibler les HRSH qui pratiquent des comportements à risque et d'encourager ceux qui pratiquent déjà des comportements sexuels sécuritaires à continuer ainsi.

Since 1981, numerous cohort studies of men having sexual relations with men (MSM) have been implemented.[1-15] However, few studies[1,3,8,12] recruited MSM outside clinical settings, focussed on the psychosocial aspects associated with HIV infection,[9] and were conducted with the aim of developing prevention programs in the gay community.[9,13] Moreover, as most of the participants of these cohorts were recruited at the beginning of the 1980s, few recent data are available regarding young MSM.[1-5,7-9,12-14] Diverse cultural settings observed among the different groups of MSM also suggest a need for local studies to better determine correlates of risk behaviours.[16]

In Canada, the Vanguard Project was implemented in Vancouver[6] whereas in Quebec, limited data are available on the HIV epidemic among MSM.[17-19] However, it seems that around 15% of Montreal's MSM are HIV-infected.[17-19] The objectives of the Omega Cohort study are to estimate HIV incidence and identify factors associated with seroconversion among MSM (particularly men of less than 30 years of age) recruited mainly outside clinical settings of Montreal; to characterize changes in sexual behaviours over time; to identify psychosociosexual factors associated with each stage of sexual behaviour in a quantitative perspective; and to facilitate the transfer of knowledge to community groups involved in HIV prevention.

More specifically, the objectives of the present analysis on preliminary data are to describe the characteristics of the Omega Cohort participants, to assess the charac-

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teristics of participants who were HIV-positive at entry in the Cohort and to obtain preliminary estimates of HIV incidence (this is an ongoing study with 787 person-years accumulated out of a total of over 6,000 planned).

METHODS

Background

The Omega Cohort project is an ongoing study on HIV incidence and psychosocial determinants of HIV seroconversion among MSM living in the Montreal area (Quebec). The study population consists of MSM aged 16 years and older who have had sex with another man in the preceding year and are HIV negative or do not know their serostatus. Interviews are carried out at the community organization Centre des gais et lesbiennes de Montréal, three private medical clinics serving a large MSM clientele, and a community health clinic. A bilingual publicity campaign was carried through the general and gay press before recruitment began in October 1996. The publicity was carried out in order to recruit approximately 50% of MSM less than 30 years of age. Most (78%) of the participants heard about the Cohort through newspapers (mostly gay), 19% on television, 27% from a friend, 13% through a poster and 14% through flyers (categories not mutually exclusive).

Data collection

Participation is voluntary. The first contact of potential participants with the study staff is by telephone. After verification of eligibility (over 99% of potential participants are eligible), an appointment is given. At the first interview, the nurse-interviewer explains the study in detail. Then, participants sign a consent form and receive the participant kit which contains additional information about the Cohort, STD leaflets, phone numbers of different community services and a condom. Participants then answer self-administered and interview-administered questionnaires. After pre-test counselling, a venipuncture is done for HIV, hepatitis B (HBV) and syphilis testing. MSM negative for HBV markers are offered vaccination free of charge.

TABLE I
Sociodemographic Characteristics of 810 MSM Participating in the Omega Cohort

Characteristics	Number *	(%)
Age (years)		
<25	183	(23)
25-34	317	(39)
≥35	310	(38)
Place of residence		
Montreal Island	729	(90)
Elsewhere	79	(10)
Years living in Montreal		
≤1	110	(14)
>1	692	(86)
Living with a male partner	147	(18)
Married, divorced, separated or living with a woman	85	(11)
Have children	87	(11)
Education level		
No university degree	444	(55)
University degree	358	(45)
Annual income ($ CDN)		
<$15,000	325	(40)
$15,000 to $29,999	223	(28)
≥$30,000	241	(30)
Do not know	10	(1)
Worked full time	364	(45)
Studied full time	164	(20)
Receiving welfare benefits or unemployment insurance	134	(17)

* Some numbers do not sum up to 810 because of missing values

Three weeks after the first appointment, participants return to receive their test results and post-test counselling. No other intervention than pre/post-test counselling is offered to participants. Participants who are HIV-positive are excluded from the study and referred to appropriate services. Participants infected with HBV or syphilis are directed toward appropriate services for treatment but remain in the study. Participants return every six months to complete follow-up questionnaires and be tested.

Laboratory procedures

MEIA (Microparticulate enzyme immuno assay) (Axsym HIV-1/HIV-2, Abbott Diagnostic, Mississauga, Ontario) for the detection of anti-HIV were performed at the Department of Microbiology, Centre Hospitalier de l'Université de Montréal, Campus Saint-Luc. Sera reactive to HIV by EIA were retested in duplicate and when two out of three were reactive, Western Blot was performed at the Laboratoire de Santé Publique du Québec.

Statistical analyses

Frequency tables were used to describe characteristics of participants. Comparisons were made using Fisher's exact test and Student's *t* test. For HIV incidence, the denominator was the sum of person-years contributed by each seronegative MSM between the baseline interview and the last follow-up interview. For seroconverters, the sum of person-years accumulated between the last negative test and the first positive test was divided by two. Analyses were performed using SAS 6.12 (SAS Institute, Cary, NC, USA). For analysis of attrition bias, logistic regression was used to identify independent variables associated with loss to follow-up.

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. Table I shows the sociodemographic characteristics of Omega participants.

Lifetime risk behaviours

Injection drug use was reported by 6% of participants among whom 48% had borrowed used needles. Thirty-five percent of participants had ever had an HIV-infected partner. Overall, 32% and 8% of participants reported unprotected oral and

TABLE II
Risk Behaviours During the Previous Six Months of 810 MSM Participating in the Omega Cohort

Behaviours	Regular partners* Number	(%)	Casual partners† Number	(%)
Number of partners‡				
0	122	(15)	186	(23)
1	345	(43)	86	(11)
2-5	290	(36)	228	(28)
6-19	36	(5)	177	(22)
20+	8	(1)	125	(16)
Anal sex with‡:				
Yes	480	(60)	296	(37)
Alcohol/drug use before anal sex with¶:				
Half the time or less	434	(91)	256	(88)
Often or very often	42	(9)	36	(12)
Condom use during insertive anal sex (% of intercourse) among men who reported anal sex with¶:				
0	94	(20)	13	(4)
1-49	33	(7)	16	(5)
50-99	82	(17)	55	(19)
100	200	(42)	171	(58)
NA §	66	(14)	41	(14)
Condom use during receptive anal sex (% of intercourse) among men who reported anal sex with¶:				
0	90	(19)	9	(3)
1-49	23	(5)	8	(3)
50-99	78	(16)	38	(13)
100	182	(38)	149	(50)
NA††	102	(21)	92	(31)

* A regular partner is someone with whom the participant had sex at least twice, someone he intended to and did see again, someone with whom he had a certain relationship (emotional, sexual or otherwise)
† A casual partner is someone with whom the participant had sex only once ("a one night stand"), someone he did not intend to see again. If he did see him again in a subsequent sexual encounter, it was by chance
‡ Some numbers do not sum up to 810 because of missing values
¶ Some numbers do not sum up to 480 for regular partners and 296 for casual partners because of missing values
§ NA: haven't had insertive anal sex with
†† NA: haven't had receptive anal sex with

anal sex, respectively, with an HIV-infected partner.

Eighteen percent of participants had ever received money for sex whereas 4% had ever received drugs for sex. Nineteen percent and 4% of MSM had given money or drugs for sex respectively. They were older than MSM who had never given money or drugs for sex (39 vs 31 years, p<0.001; 40 vs 32 years, p<0.001, respectively).

Risk behaviours during the six months preceding participation in the study

Table II shows the recent risk behaviours of the Omega participants.

The proportion of MSM who reported always using condoms with regular partners during insertive anal sex was 42% among men who reported only 1 regular partner, 56% among men who reported between 2 and 5 regular partners and 54% among those with more than 5 partners. For receptive anal sex with regular partners, these proportions were 44%, 55% and 48%, respectively.

Among MSM who had 5 casual partners or less, 81% and 78% reported always using condoms during insertive and receptive sex, respectively. Among men who reported between 6 and 19 partners, these proportions were 63% and 66%, respectively. Among men with 20 partners and more, 57% had always used condoms during insertive sex and 76% during receptive sex. Overall, 31% of MSM reported unprotected anal sex with regular partners and 12% with casual partners.

Four percent and eleven percent of 311 participants reported unprotected anal sex and unprotected oral sex respectively with HIV-infected partners (the number of participants sum up to 311 instead of 810 because this question was added to the questionnaire after the beginning of the study).

HIV infection

Overall, 8 (0.98% [95% Confidence Interval (CI): 0.43%-1.94%]) out of 810 participants were HIV-positive at baseline interview. Five HIV-positive MSM reported unprotected anal sex with regular, casual, client, prostitute or HIV-infected partners lifetime. Four of these five men also reported unprotected oral sex with an HIV-infected partner. Three infected participants reported only unprotected oral sex. One of these three men reported unprotected oral sex with an HIV- infected partner and a condom rupture or slippage during anal sex with an HIV-infected partner.

Among the 730 participants who completed at least their first six-month follow-up interview as of the end of August 1998 (787 person-years), 7 MSM seroconverted for an HIV incidence of 0.89 per 100 person-years (95% CI: 0.36-1.83).

Analysis of attrition bias

Among the 802 HIV-negative MSM who enrolled in the study before the end of 1997, 710 (89%) came back to attend their first follow-up interview. Concerning lifetime behaviours, as compared to men who came back for follow-up, drop-outs reported more often: injection drug use (16% vs 5%, p=0.004), having received money for sex (33% vs 16%, p=0.023) and anal sex with casual partners (81% vs 70%, p=0.039). Among the 493 HIV-negative MSM who had attended Omega for their first follow-up interview as of the end of 1997, 456 (93%) had come back for their second follow-up interview before the end of August 1998. As compared to current participants, drop-outs were more often: drinking alcohol before sex (47% vs 24%, p=0.004), receiving welfare benefits (26% vs 9%, p=0.028) and practicing recent unprotected anal sex with casual partners (23% vs 10%, p=0.008).

DISCUSSION

Around 50% of MSM who reported recent anal sex with regular partners used a condom on every sexual encounter. With our baseline questionnaire, it was not possible to distinguish between regular partners of unknown serostatus, positive or negative status. However, the fact that

some of these episodes occurred between regular partners does not necessarily represent a lower risk of HIV infection since our definition of regular partner is broad and some men reported numerous serial and/or concurrent regular partners. It has been reported that concurrency, instead of serial monogamy, might amplify HIV transmission.[20]

Among MSM who reported anal sex with casual partners, the proportion of men using condoms on every encounter did not increase with a higher number of partners. As the likelihood of meeting an HIV-infected partner increases with an increasing number of partners, there might be significant exposure to HIV despite proportions of condom use as high as 80%.

Overall, the frequency with which participants used condoms during the preceding six months is considerable, particularly in comparison with the frequency of use observed among heterosexual men. However, as it is estimated that around 15% of Montreal's MSM are currently HIV-infected,[17-19] a proportion of 12% of MSM who practice unprotected anal sex with casual partners could significantly increase the risk of new HIV infections.

It is difficult to compare the proportions of risk behaviours practiced by different groups of MSM since, among all, "risk behaviours" has different meanings according to studies. However, the proportion of participants who reported recent unprotected anal sex is not so different than proportions observed in other groups of MSM.[11,15,16,18]

At entry in the study, 1% of participants were HIV-infected. This proportion does not represent the HIV prevalence of Montreal's MSM since Omega participants are HIV-negative or do not know their serostatus at enrolment. Five of these HIV-infected participants reported unprotected anal sex which is the most important risk behaviour associated with HIV infection among MSM.[4,5,9-11] Two participants reported only unprotected oral sex as a risk factor for their HIV infection. Unprotected anal sex may be underreported among Omega participants but it is also possible that oral sex may be implicated in some new infections.[11,21]

The HIV incidence that we observed is similar to the HIV incidence estimated for Montreal's MSM using a components model by Remis et al.[22] Our results are also somewhat similar to the results obtained by Holmberg[23] aiming to estimate the HIV incidence among MSM in 96 US metropolitan areas. Among Omega participants, men recently lost to follow-up are poorer and more often practicing risky sexual behaviours than steady participants. However, our very high retention rate and the continuous recruitment of participants tend to minimize the lost to follow-up bias.

Our study has several limitations: as we wanted MSM of less than 30 years old to constitute approximately 50% of our study group, publicity was adjusted consequently. Participation was voluntary and MSM had to be tested for HIV antibodies. Participants may have had different characteristics and risk behaviours than MSM who did not intend to participate. Moreover, HIV-infected participants at entry in the study may not represent HIV-infected MSM in Montreal's gay community. Participants also have accepted to attend a community gay centre or a medical clinic serving a large clientele of MSM.[5] These MSM were probably at least partly "out of the closet"; thus, MSM who do not identify with the gay community may be under-represented in this study.[11]

However, by recruiting MSM through gay community organizations, private clinics, community health clinics, snowballing, newspapers, leaflets, etc., we increased the diversity of our participants[1,9,16] and avoided some problems encountered when recruiting only through medical clinics or STD clinics,[4,5,8,12] public venues[16] or public gay venues.[11]

In conclusion, a high proportion of participants reported consistently using condoms during anal sex although a significant proportion reported recent risk behaviours. The HIV incidence is relatively low but there is a documented risk of transmission among participants. According to the modelling work of Remis and colleagues,[22] there are 30,000 to 40,000 HIV-negative MSM in Montreal. Thus, an estimated HIV incidence of 0.9 per 100 p-y could lead to between 270 and 360 new HIV infections each year in Montreal. To decrease this number of new infections, it is of utmost importance to find out which groups of MSM have not yet been reached by HIV prevention messages and among those men who have been reached, to encourage and increase sustained safe sexual behaviours.

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